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*Fragility—
and resilience—
in food systems*



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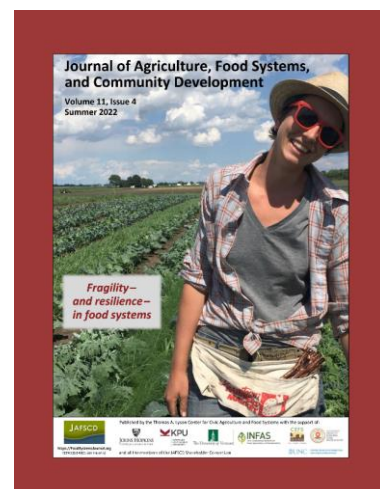
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Contents | Volume 11, Issue 4 / Summer 2022

On our cover: Julia Slocum was the owner and operator of Lacewing Acres, a small certified organic vegetable farm in Ames, Iowa, from 2012 to 2019. She is now a first-year doctoral student in counseling psychology at Iowa State University. Read about the decision to close her farm operation in *Ending Lacewing Acres: Toward amplifying microperspectives on farm closure*, by Abby M. Dubisar and Julia A. Slocum, in this issue.

Photo by Andrea Rissing



Editorial

IN THIS ISSUE: Fragility—and resilience—in food systems / *Duncan Hilchey* 1

Column

THE ECONOMIC PAMPHLETEER: Can we afford good food? / *John Ikerd* 5

Commentaries

In search of the New Farmers of America: Remembering America's forgotten Black youth farm movement / *Bobby J. Smith II* 9

Effect of the COVID-19 pandemic on the food system in Abeshge District, Central Ethiopia / *Tsegamariam Dula* 13

Open Call Papers

Ending Lacewing Acres: Toward amplifying microperspectives on farm closure / *Abby M. Dubisar and Julia A. Slocum* 19

A qualitative investigation of resilience among small farms in western Washington State: Experiences during the first growing season of COVID-19 / *Dani Ladyka, Yona Sipos, Marie L. Spiker, and Sarah M. Collier* 35

Challenges for the agritourism sector in the United States: Regional comparisons of access / *Chadley Richard Hollas, Weinei Wang, Lisa Chase, David Conner, and Jane Kolodinsky* 61

Farmer attitudes and perceptions toward gleaning programs and the donation of excess produce to food rescue organizations / *Susan P. Harvey, Rebecca Mount, Heather Valentine, and Cheryl A. Gibson* 77

Community food systems resilience: Values, benefits, and indicators / <i>Catherine G. Campbell, Alicia Papanek, Alia DeLong, John Diaz, Cody Gusto, and Debra Tropp</i>	89
Planning toward sustainable food systems: An exploratory assessment of local U.S. food system plans / <i>Jane Karetny, Casey Hoy, Kareem M. Usher, Jill K. Clark, and Maria Manta Conroy</i>	115
National food security, immigration reform, and the importance of worker engagement in agricultural guestworker debates / <i>Anna Zoodsma, Mary Jo Dudley, and Laura-Anne Minkoff-Zern</i>	139
Perceived barriers to client-choice conversion among Arkansas food pantries / <i>Kathryn A. Carroll and Rachel Schichtl</i>	153
Evaluating the successes and challenges toward achieving the Real Food Commitment at Johns Hopkins University / <i>Jeremy Berger, Raychel Santo, and Isabela Garces</i>	165
Studying hard while hungry and broke: Striving for academic well-being while navigating food insecurity / <i>Kristin Osiecki, Jessie Barnett, Angie Mejia, Tessie Burley, Kara Nybus, and Kaitlyn Pickens</i>	183
Social value of a Canadian urban food bank garden / <i>Wanda Martin, Anh Pham, Lindsey Wagner, and Adrian Werner</i>	197
Evaluation of a sustainable student-led initiative on a college campus addressing food waste and food insecurity / <i>Kendra OoNorasak, Makenzie L. Barr, Michael Pennell, Jordan Hinton, Julia Garner, Cora Kerber, Celia Ritter, Liana Dixon, Cana Robde, and Tammy J. Stephenson</i>	223
Community relationships and sustainable university food procurement: The University of North Carolina at Chapel Hill and the Real Food Challenge / <i>Katehyn Cline, Alexandria Huber-Disla, Amy Cooke, and Elizabeth Havice</i>	239
Growing health: Building partnerships in healthcare and food systems for improved food access in Appalachia / <i>Annie Koempel, Lilian Brislen, Krista Jacobsen, Jessica Clouser, Nikita Vundi, Jing Li, Mark A. Williams, and Mark V. Williams</i>	261
A food-system approach to addressing food security and chronic child malnutrition in northern Vietnam / <i>Cecilia Rocha, Melody Mendonça, Nguyen Do Huy, Huỳnh Nam Phương, Do Thi Bao Hoa, Fiona Yendall, Andrea Moraes, Matthew Ryan Brown, Yvonne V. Yuan, and Thomas Tenkate</i>	273

Reviews

Food inequality: One part of a much larger problem (review of <i>How the Other Half Eats: The Untold Story of Food and Inequality in America</i> , by Priya Fielding-Singh) / <i>Jules Hathaway</i>	293
Regenerative agriculture and racial justice (review of <i>Healing Grounds: Climate, Justice, and the Deep Roots of Regenerative Farming</i> , by Liz Carlisle) / <i>Natasha Shannon</i>	295
An approachable companion text for introductory food law students — and other readers (review of <i>Food Systems Law: An Introduction for Non-Lawyers</i> , by Marne Coit and Theodore A. Feitshans) / <i>Cyndee Bence and Matthew M. Giguere</i>	299

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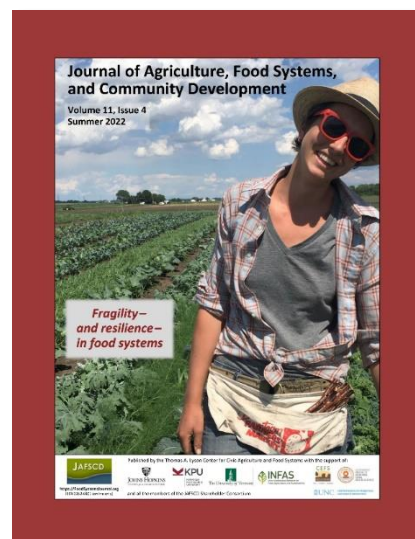
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IN THIS ISSUE DUNCAN HILCHEY

Fragility—and resilience—in food systems



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This summer issue (volume 11, issue 4) includes papers on a wide range of food systems topics, many of which relate to both the fragility and the resilience of food systems. Gracing our cover is Julia Slocum, who was the owner and operator of Lacewing Acres, a small certified-organic vegetable farm in Ames, Iowa, from 2012 to 2019. (She is now a first-year doctoral student in counseling psychology at Iowa State University.) In this issue, you will read about her decision to close her farming operation in *Ending Lacewing Acres: Toward amplifying microperspectives on farm closure* (co-authored by Abby Dubisar at Iowa State University).

Julia's experience highlights the challenge of being a beginning farmer in the U.S. Small-scale, community-based farming is certainly one of the most difficult occupations to take up. For at least two-thirds of each year, it is an all-consuming endeavor. In daylight hours, small local growers manage dozens of crops (each of which has its own requirements to flourish); they may have to manage co-workers, customers, perhaps CSA members, a retail operation, wholesale accounts, and so on. In their evenings, they track production and sales, fill out surveys and tax forms, and nurse aches and injuries received during the day. Imagine going to bed exhausted and then having nightmares about crop failures or injuries or even lawsuits. Somehow, they must find time to recover and carve out personal and family time.

The farmer toils physically all day for much of the year in all kinds of weather, manages multiple health and financial risks—and each day the struggles are renewed. Many farmers still would not trade the experi-

On our cover: Julia Slocum was the owner and operator of Lacewing Acres, a small certified organic vegetable farm in Ames, Iowa, from 2012 to 2019. Read about the decision to close her farm operation in [Ending Lacewing Acres: Toward amplifying microperspectives on farm closure](#), by Abby M. Dubisar and Julia A. Slocum, in this issue.

Photo by Andrea Rissing

ence for the world. And yet Julia did trade it in, and for good reason: the effort was not worth the cost to her quality of life. And so, she set about ending Lacewing Acres—doing it her way and with an extraordinary dignity that was appreciated by all her shareholders and business partners.

We begin the issue with **John Ikerd's** THE ECONOMIC PAMPHLETEER column, entitled *Can we afford good food?* His answer is a nuanced “yes,” but it will require eaters to dramatically change their lifestyles and make more informed food choices. This column triggers an obvious next question: what percentage of Global North citizens are prepared to do this?

Next are two informative commentaries: *In search of the New Farmers of America: Remembering America's forgotten Black youth farm movement*, by **Bobby J. Smith II**, and *Effect of the COVID-19 pandemic on the food system in Abeshge District, Central Ethiopia*, by **Tsegamariam Dula**.

We begin our open call papers with a minitheme focused on food system fragility and resilience. As advertised, we lead off with *Ending Lacewing Acres: Toward amplifying microperspectives on farm closure*, in which friends **Abby M. Dubisar** and **Julia A. Slocum** present the candid story of the closure of a community-oriented farm.

In *A qualitative investigation of resilience among small farms in western Washington State: Experiences during the first growing season of COVID-19*, authors **Dani Ladyka**, **Yona Sipos**, **Marie L. Spiker**, and **Sarah M. Collier** take an in-depth look at the lived experience of community-oriented small farms during the pandemic and spotlight the “buffer and adaptive strategies” that allowed them to absorb financial and operational shocks.

Next, in *Challenges for the agritourism sector in the United States: Regional comparisons of access*, **Weiwei Wang**, **Chadley Richard Hollas**, **Lisa Chase**, **David Conner**, and **Jane Kolodinsky** use Penchansky and Thomas's five dimensions of access framework to find that, while agritourism operators across regions experience different sets of issues, liability is a significant and common concern.

Continuing our minitheme, in *Farmer attitudes and perceptions toward gleaning programs and the donation of excess produce to food rescue organizations*, **Susan P. Harvey**, **Rebecca Mount**, **Heather Valentine**, and **Cheryl A. Gibson** compare groups of farmers who participate in gleaning and those who do not and highlight the barriers to adoption of this critical component of local food systems.

After these farm-focused papers, we turn to resilience in the context of nonfarm domains of food systems.

In *Community food systems resilience: Values, benefits, and indicators*, **Catherine G. Campbell**, **Alicia Papanek**, **Alia DeLong**, **John Diaz**, **Cody Gusto**, and **Debra Tropp** present the results of their research underlying the development of the Community Agriculture & Resilience Audit Tool (CARAT).

Jane Karetny, **Casey Hoy**, **Kareem M. Usher**, **Jill K. Clark**, and **Maria Manta Conroy** then present a sustainable food system policy index to evaluate, compare, and contrast municipal food system plans in their article, *Planning toward sustainable food systems: An exploratory assessment of local U.S. food system plans*.

In their policy analysis entitled *National food security, immigration reform, and the importance of worker engagement in agricultural guestworker debates*, **Anna Zoodma**, **Mary Jo Dudley**, and **Laura-Anne Minkoff-Zern** find striking differences in opinions between grassroots and national labor organizations regarding the H-2A Temporary Agricultural Visa Program and reforms proposed by the Farm Workforce Modernization Act.

Next, **Kathryn A. Carroll** and **Rachel Schichtl** identify the challenges experienced by Arkansas food pantries in transitioning from a prescribed box model to a client-choice model in *Perceived barriers to client-choice conversion among Arkansas food pantries*.

In *Evaluating the successes and challenges toward achieving the Real Food Commitment at Johns Hopkins University*,

Jeremy Berger, Raychel Santo, and Isabela Garces present a case study of how the institution fared in fulfilling its commitment to purchase 35% “real food” by 2020.

Kristin Osiecki, Jessie Barnett, Angie Mejia, Tessie Burley, Kara Nyhus, and Kaitlyn Pickens then present a reflective essay about their experiences as hungry students and faculty in *Studying hard while hungry and broke: Striving for academic well-being while navigating food insecurity*.

In *Social value of a Canadian urban food bank garden*, **Wanda Martin, Anh Pham, Lindsey Wagner, and Adrian Werner** use a social return on investment evaluation to estimate the social value (in dollars) of an exemplar piece of local food system infrastructure.

Kendra OoNorasak, Makenzie L. Barr, Michael Pennell, Jordan Hinton, Julia Garner, Cora Kerber, Celia Ritter, Liana Dixon, Cana Rohde, and Tammy J. Stephenson then present an in-depth case study of a campus-based food recovery program (including operational and evaluation data) in *Evaluation of a sustainable student-led initiative on a college campus addressing food waste and food insecurity*.

Next is *Community relationships and sustainable university food procurement: The University of North Carolina at Chapel Hill and the Real Food Challenge*, by **Katelyn Cline, Alexandria Huber-Disla, Amy Cooke, and Elizabeth Havice**, in which the authors explore the effects of third-party certifications on campus food purchases.


In *Growing health: Building partnerships in healthcare and local food systems for improved food access in Appalachia*, **Annie Koempel, Lilian Brislen, Krista Jacobsen, Jessica Clouser, Nikita Vundi, Jing Li, Mark A. Williams, and Mark V. Williams** explore the challenges in building a farm-to-hospital program.

In our final paper, entitled *A food-system approach to addressing food security and chronic child malnutrition in northern Vietnam*, **Cecilia Rocha, Melody Mendonça, Nguyen Do Huy, Huỳnh Nam Phương, Do Thi Bao Hoa, Fiona Yeudall, Andrea Moraes, Matthew Ryan Brown, Yvonne V. Yuan, and Thomas Tenkate** present a case study of a holistic value-chain approach to addressing food insecurity.

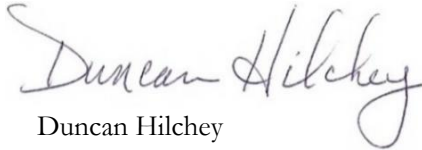
Wrapping up the issue are three book reviews. **Jules Hathaway** reviews *How the Other Half Eats: The Untold Story of Food and Inequality in America*, by Priya Fielding-Singh; **Natasha Shannon** reviews *Healing Grounds: Climate, Justice, and the Deep Roots of Regenerative Farming*, by Liz Carlisle; and **Cyndee Bence and Matthew M. Giguere** review *Food Systems Law: An Introduction for Non-Lawyers*, by Marne Coit and Theodore A. Feitshans.

In closing, I'd like to circle back to our cover story. While it is true that community-based small farms need a sufficient and reliable market, and to survive they need to scale up either on their own or through cooperation with other farmers, they must also, frankly, let go of the misguided “if I build it, they will come” attitude. Demeter’s call to till the soil is powerful, and young and beginning farmers must guard against overromanticizing their occupation. I therefore question how helpful it is that we outsiders put young groundbreakers on a pedestal and exalt them for their heroism, their hard work stewarding the land, bringing us high-quality good food, and making a contribution to our own quality of life. Indeed, they do these things, but is our praise, in effect, just contributing to the tremendous pressure small and beginning farmers are under? Perhaps we need to tone down our enthusiasm just a little and make space to hear about the challenges of this pursuit as well.

In their case study about Lacewing Acres, Julia Slocum and Abby Dubisar call for more stories about farm closure, to help to eliminate the stigma around farm closure and illuminate the reality that being part of a good food system may be but a single stage in one’s life journey. Many good things can come about as a result of the operator’s challenging experience—and decision to move on. JAFSCD agrees, and we ask our shareholder community to submit case studies on farm closures and to collaborate with farmers in preparing

reflective essays about their lived experiences, including their lives after farming. Furthermore, is there a toolkit for thoughtfully and strategically shutting down a farm operation and capitalizing on the experience? If not, let's develop one and include it in every beginning farmer program being offered. After all, the success of a farm shouldn't be measured by how long it lasts but by what it contributed to its stakeholder community while it was in operation. And, as a likely extension of an operator's farm experience, their plan B may allow them to continue to enjoy satisfying work and make meaningful and lasting contributions to society. 

Peace, health, and happiness to all,



Duncan Hilchey

Publisher and editor in chief



THE ECONOMIC PAMPHLETEER JOHN IKERD

Can we afford good food?

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Can we all afford enough wholesome, nutritious, sustainably produced food to support healthy, active lives? The good news is, yes, we can afford enough good food, enough for everyone—today and in the future. The bad news is that many people will need to make some very different food choices. National and global food systems do not change very quickly or easily, but individuals can change their food choices. Changes in individual food choices can lead to changes in local food systems, and changes in local food systems can lead to changes in national and global food systems.

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Producing enough good food is not the problem. Today's farmers are already producing more than enough food for everyone in the world, even though more than 800 million people remain "chronically undernourished" (United Nations, 2019). This is certainly true in the U.S., where agricultural production is abundant, yet in 2020 one in nine households, and one in seven households with children, were classified as "food insecure" (U.S. Department of Agriculture Economic Research Service [USDA ERS], n.d.-a). Meanwhile, about 40% of the most productive farmland in the

*Why an **Economic Pamphleteer**? In his historic pamphlet Common Sense, written in 1775–1776, Thomas Paine wrote of the necessity of people to form governments to moderate their individual self-interest. In our government today, the pursuit of economic self-interest reigns supreme. Rural America has been recolonized, economically, by corporate industrial agriculture. I hope my "pamphlets" will help awaken Americans to a new revolution—to create a sustainable agri-food economy, revitalize rural communities, and reclaim our democracy. The collected Economic Pamphleteer columns (2010–2017) are at <https://bit.ly/ikerd-collection>*

U.S. is used to produce ethanol for our automobiles (USDA ERS, n.d.-b). In addition, U.S. farmers export more than 20% of their total production (Office of the United States Trade Representative, 2019).

U.S. farm exports do not go to the nations that suffer the most from hunger but to nations whose consumers can afford to pay global market prices. An analysis of U.S. farm exports for 2015 found that 86% of U.S. farm exports went to 20 nations classified by the United Nations as medium-to-highly developed, and only half of one percent went to 19 of the least developed nations, including Haiti, Yemen, and Ethiopia (Environmental Working Group, 2016).

Contrary to the mantra of American agriculture, industrial agriculture does not “feed the world.” Small and mid-sized family farms (those up to 250 acres or 101 hectares) currently produce about 70% of the world’s food supply (Ritchie, 2021). Close to half of these farms cultivate less than five acres. Global research has shown that production on these farms could be more than doubled using non-industrial, agroecological farming systems (Grain, 2011). Solving the global hunger problem will require helping farmers in developing nations produce enough good food to meet their own needs and the needs of others in their nations (Ikerd, 2015). However, hunger will persist, globally and in the U.S., until enough people care enough to recognize and ensure nutritional food security as a basic human right (Ikerd, 2016a).

Today’s quick, convenient, and cheap food is made possible only by imposing high environmental, public health, and social costs on society (Rockefeller Foundation, 2021). Even if these environmental and public health costs were prohibited or “internalized” by changes in U.S. government policies, any shortfall in production could be offset easily by more sustainable farming operations. For example, a 2014 meta-analysis of 115 studies found that organic crop yields averaged less

than 20% lower than conventional, and yields were less than 10% lower on farms using intercropping and integrated crop rotations (Yang, 2014). Sustainability, not productivity, is the challenge to food security in the U.S.

That being said, farming systems that impose fewer environmental and social costs on society cost more to operate than do industrial farming operations—at least in the short run. However, there is no reason to expect food costs to increase as much as the current ecological and social costs of industrial agriculture, because most of these

costs can be avoided by shifting to more sustainable means of production. In any case, most Americans could easily afford to pay the full economic, ecological, and social costs of food production, and Americans can afford to help the rest of the people of the world to do likewise.

Over the past several years, U.S. households have been spending less than 10%

of their disposable incomes, on average, on food (USDA ERS, n.d.-d). Admittedly, many low-income consumers spend a larger share of their income on food, but high food prices are not the *cause* of food insecurity (Ikerd, 2016b). In 2020, U.S. farmers received only about 16 cents of each dollar spent by consumers (USDA ERS, n.d.-e). Even if farm-level production costs increased by 50%, retail food prices would need to increase by only 8% (50% of 16%) to accommodate the higher farm-level costs. U.S. food prices increased more than 10% between April 2021 and April 2022 (U.S. Bureau of Labor Statistics, 2022), with no improvement in food quality or integrity. Consumers currently spending 10% of their incomes for *industrial food* would need to spend less than 1% more of their incomes for *good food*.

Defenders of the industrial agri-food status quo are economically and politically powerful, and governments are unlikely to make the necessary changes in farm and food policies until they are forced to do so. However, people do not need

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government approval to change their individual food systems. At the very least, consumers could reduce food costs by wasting less food. Between 30% and 40% of the food produced in the U.S. is currently wasted (USDA, n.d., para. 1). More than three-fourths of all food waste occurs at the retail and consumer levels (USDA, n.d.). Most of these wastes are avoidable, and the unavoidable waste could be composted to use as fertilizer to support food production.

Food costs could also be reduced by eating more meals at home. About half of all U.S. food spending goes for foods eaten away from home, in restaurants and other eating establishments (USDA ERS, n.d.-c). From 1993 to 2020, the farm share averaged 14%. The share for meals eaten away from home was only 5%, compared with 22% for meals eaten at home (calculated from data from USDA ERS, 2022). Since farm-level costs are essentially the same for both, this suggests that food eaten away from home costs about four times as much as food eaten at home and puts less money in the farmer's pocket.

A typical household spending US\$8,000 per year for food (US\$4,000 at home and US\$4,000 away from home) could save US\$1,500—more than 20% of total food costs—by cutting spending on away-from-home meals by half. That is, the US\$2,000 reduction in the cost of eating out would be offset by just US\$500 in additional supermarket purchases. The farm share also would increase from 14% to 17%. Admittedly, if all consumers made such a change, there would be significant impacts on the foodservice industry; but this is true of any major change in national or global food systems.

Food costs and the farm share could be improved even more through direct sales of raw and minimally processed food from farmers to consumers. Farmers markets, farm stands, community supported agriculture operations (CSAs), buying clubs, and online purchases are all logical options. Farmers who sell direct to customers

typically have higher production costs than industrial producers and rely on greater ecological and social integrity of their farming systems to receive prices high enough to cover their costs plus a reasonable margin of profit. The economic advantage of direct sales is that both farmers and customers have choices that are not available to them in the industrial agri-food system.

Neither farmers nor consumers can avoid paying some portion of the 86 cents of each food dollar that is typically spent for processing, transportation, packaging, advertising, and other marketing services. For example, live hogs or chickens are not yet food and typically are not raised in

consumers' backyards. Consumers occasionally buy live animals from farmers, but they have to pay custom processors to turn them into food. Farmers markets, CSAs, and other direct sales all involve costs for farmers and their customers that would not be incurred in the conventional agri-food system. That said, many of the costs that make up the farm-to-retail spread are avoidable through direct sales—just not

all. The farm-to-retail share of US\$6,880 (86% of a typical US\$8,000 household food budget) provides farmers and their customers with a lot of different choices to consider for making good food both profitable and affordable.

Finally, consumers who are willing to invest their time, energy, and intellect in home gardening can reduce the cost of fresh, locally grown fruits and vegetables to the cost of seed, seedlings, and a few hand tools. Russians obtain “over 50% [of] agricultural products from family garden plots ... roughly 92% of all Russian potatoes, 87% of all fruit[,] 77% [of all] vegetables, and 59% of all Russian meat[,] according to the Russian Federal State Statistic Service” (Pool, 2014, para. 1). The Russians do it out of necessity, but home gardening can be a wise choice for anyone.

The deciding tradeoff in nearly all such choices is between convenience and costs. Many people in the U.S. can easily afford to pay the full

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ecological, social, and economic costs of good food in supermarkets and restaurants—if they choose to do so. Others cannot. For many, choosing good food is not an easy choice in today's hectic world, where there never seems to be enough time or energy for everything that needs to be done. For these people, making good

food affordable means fundamentally changing their individual food systems, from production through to consumption: changing from depending on a system that prioritizes “quick, convenient, and cheap” food to one that prioritizes food “quality, integrity, and value.”



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JAFSCD COMMENTARY

In search of the New Farmers of America: Remembering America's forgotten Black youth farm movement

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Any historical narrative is a particular bundle of silences, the result of a unique process, and the operation required to deconstruct these silences will vary accordingly.

—Michel-Rolph Trouillot,
Silencing the Past, p. 27

On October 13, 1965, the New Farmers of America (NFA) disappeared without a trace. The organization had operationalized one of the largest Black youth farm movements in American history and boasted a membership of over 50,000 Black farm boys studying vocational agriculture in public high schools in 18 states across the South and parts

of the East Coast. They were last seen in the shadows of the Jim Crow era, participating in the national convention of the majority-white Future Farmers of America (FFA)—now named the National FFA Organization—in Kansas City, Missouri. At the convention, a ceremony took place that symbolized the July 1, 1965, decision to merge the NFA and FFA. But for some, as one former member told me, the “merger” was more like a “hostile takeover.” The “pageantry of the merger,” as Cecil L. Strickland, Sr. (1994, p. 44) described it, required Adolphus Pinson, the NFA's last president, to surrender the organization's charter to Kenneth Kennedy, the national FFA president. “I am duly authorized to transfer to you the National NFA Charter, together with the permanent record of officers of the organization,” Pinson told Kennedy. “Also, to inform you that the total membership of 50,807 students of vocational agriculture in 12 states are now active members of the

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Future Farmers of America” (Strickland, 1994, p. 43). The NFA charter was placed in the national FFA archives along with the minutes of the last NFA convention and important cultural artifacts of the organization, including its banner and flag. The NFA also transferred the US\$20,000 in its savings account to the FFA treasury. The final nail in the coffin for the NFA occurred when Pinson took off his NFA jacket and handed it to Kennedy. In return, Kennedy presented Pinson with an FFA jacket, declaring, “The exchanging of this NFA jacket for the FFA jacket by you, the last NFA President, symbolizes the joining together all students of vocational agriculture into one great organization” (Strickland, 1994, p. 46). And with Kennedy’s final statement, the NFA vanished.

What is analytically interesting about the mere existence and disappearance of the NFA is the near total absence of the organization in American history and histories of the Black experience. The absence of the organization in scholarly and public conversations about food justice, food sovereignty, and land justice in the context of urban and rural Black life. The absence of the NFA in ongoing, mainstream debates about the plight of Black farmers or the lack of Black youth and other marginalized communities interested in agriculture and farming.

Most people hear about the NFA through flashpoints in the history of the FFA. The *Journal of Agricultural Education*, the premier journal in the discipline of agricultural education, is virtually the only academic terrain that provides glimpses of the remarkable history of the NFA. Even there, only five articles have been published on the NFA (Connors, 2021; Connors et al., 2010; S. L. Jones et al., 2021; W. A. Jones et al., 2021; Wakefield & Talbert, 2003). While this scholarship provides a crucial window through which we can begin to see and unearth the story of the NFA, it situates the NFA in relation to the FFA. This positioning obscures the rich and instructive history of the NFA—producing “a particular bundle of silences,” borrowing the words of anthropologist Michel-Rolph Trouillot in the epigraph at the beginning of this essay, surrounding the life of the NFA.

In many respects, such silences around the NFA raise a number of questions. What was the

NFA? How did it operate? Why do we not know about the NFA? Who were the key figures in the organization? Who were the over 50,000 Black farm boys who devoted themselves to the NFA? How did the NFA affect their lives? Where are they now? What can we learn about the NFA that could help us understand the current state of agriculture in rural and urban Black communities? How does the existence of the NFA reshape how we think about American history in general and Black history in particular? How can the NFA be a blueprint for Black youth today who are interested in agriculture but do not see any representation? As a scholar who studies agriculture and food in Black life, I purposely pose these questions in no particular order because that is how they entered my mind when I unknowingly started my search for the NFA.

Interestingly, my search for the NFA began with a text message. I was at home on the evening of March 17, 2019, watching some random show on Netflix, when I received a text message from my sister. She had been in my mother’s garage all day, cleaning out old storage bins from her own college days at Prairie View A&M University (PVAMU), the Lone Star State’s 1890 land-grant university that is also designated as one of the nation’s Historically Black Colleges and Universities (HBCUs). It had been about 15 years since my sister had even seen the bins, and they were filled with old books and notes from her undergraduate studies as an agriculture major focused on agronomy. As she combed through book after book, reminiscing about her academic life on “The Hill,” buried in the crevices of the last bins, she found two books: Ernest M. Norris’s *Forty Long Years* and Cecil L. Strickland, Sr.’s *New Farmers of America in Retrospect: The Formative Years 1935-1965*. She immediately stopped going through the bins, snapped a picture of the books and sent it to me. “Going through old books and came across these gems,” her text message captioned the picture. As I examined the books in the photo and conducted a quick Google search of them, I found out that both books documented the history of the NFA. I was blown away by the fact that I had never heard of the organization. My sister was a student of Strickland, and he was a student of Norris, yet my

sister's intellectual lineage in the study of agriculture was never a topic of conversation growing up. Even though Norris and Strickland are no longer with us, their work in NFA and as professors of agricultural education at PVAMU played a crucial role in the development of the College of Agriculture and Human Sciences (CAHS) at PVAMU—the same college I graduated from in 2011. Excited about my “discovery,” I responded to my sister's text: “I NEED all of those!!! And anything else you find is great!! I'm going to write a paper on them.” A few weeks later, I received the books from my sister and embarked on my search for the NFA.

Founded as a national organization in 1935, the NFA was more than just an organization for Black boys in rural America. It was an incubator for the early twentieth-century Black youth farm movement that began in the South. This movement shaped the minds of Black boys and their communities. The NFA offered them a pathway to use agriculture as a site for Black self-determination, community uplift, economic vitality, and food security. The NFA was also a pipeline for Black boys who wanted to study agriculture at the college level at HBCUs, and these institutions provided administrative space for the organization. This pipeline produced generations of Black farmers, college professors, college presidents, federal USDA agents, cooperative extension personnel, and state agriculture officials, to name a few roles that NFA members assumed over the years. As I learned more about the NFA's pipeline, I reached out to two of my own professors at PVAMU to inquire about their knowledge of the NFA. I was surprised to find out that they were both products of the NFA. In our many conversations, both told me that the NFA is the reason why they decided to pursue a career in agriculture through the prism of teaching, research, and service in higher education. They also made clear to me that the NFA is one of the reasons why they wanted to train the next generation of Black boys like me who majored in agriculture and were interested in pursuing a career related to agriculture and food systems.


Three years into my search for the NFA, I am now working on the first book that tells the story of the NFA in Texas, formally known as the Texas Association of the New Farmers of

America. I see this book as my “homecoming” book in that I see myself as a part of this story. The story reveals that the NFA was not a product of a relationship between the NFA and FFA; it was born out of the lives of Black boys who navigated a sociopolitical landscape of agricultural education that itself was shaped by racial segregation in the wake of the Smith-Hughes Act of 1917 that authorized the nation's precollege vocational agricultural education program that operated in public schools (Strickland, 1994). The scant research and discourses that discuss the NFA have provided an important narrative that captures the national story of the NFA, but overlooks the particularities of the organization at the local and state levels and how it shaped Black life in places like Texas. Understanding and documenting such particularities requires us to work against the deafening silence that has long rendered the NFA invisible.

As I am writing this essay, Antoine J. Alston, Dexter B. Wakefield, and Netta S. Cox's book *The Legacy of the New Farmers of America* represents the most recent treatment of the NFA. This book mixes photographs with stories about the NFA that emphasize the structure and leadership of the organization to honor and illuminate “the historical significance and legacy of the New Farmers of America and its former members” (Alston et al., 2022, p. 6). The book follows along the same lines as the current scholarship on the NFA. My book takes a “bottom-up” approach to understanding the story of the NFA and creates a conversation between the national body, state associations, and local chapters. This approach will enable my book to de-center the FFA and shed light on how the NFA emerged in rural Black communities as they struggled for access to vocational agricultural education in the early twentieth century. It will also show how the NFA continues today in the lives of Black children like me in organizations including the National FFA and the National Society for Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS). It is my hope that my book, as it builds on the minimal scholarship on the NFA, invites others to begin their own search for the NFA. The NFA provides a model for those concerned about agriculture in Black life.

This model centers Black youth, who are often overlooked in discussions about the future of the agricultural worlds we navigate as a nation. Indeed, such worlds are steeped in inequality at multiple

levels. But the NFA shows us that in the face of such inequality, Black youth offer us a canvas by which we can reshape the past, present, and future of agriculture.



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JAFSCD COMMENTARY

Effect of the COVID-19 pandemic on the food system in Abeshge District, Central Ethiopia

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Introduction

The agricultural-food system delivery chain, which connects producers to consumers, incorporates on-farm activities in production and distribution. The chain has faced a challenge during the ongoing COVID-19 pandemic (Fan et al., 2021). It is essential to address COVID-19's existing and potential impacts on the agri-food sector from the perspectives of both food supply and food demand. In this commentary, I report on a study conducted in 2021 to assess the effect of COVID-19 on the food system both in production and distribution aspects in the Abeshge District of central Ethiopia. The survey revealed that residents in the district had an average level of food consumption during the outbreak of COVID-19. The survey also suggests that

COVID-19–related restrictions launched by the Ethiopian government could hamper crop value chains, with negative effects on farmers' income from food production and distribution.

Overview

COVID-19 was first identified in late December 2019, and the World Health Organization (WHO) declared a pandemic on March 11, 2020. The pandemic has affected people on both a national and individual level. But one of the biggest consequences of this pandemic is its disruptive effect on the food system (United Nations, 2020). The impact of COVID-19 on national food systems is expected to be greater in low-income African countries like Ethiopia, which is the focus of this study district location. Therefore, it seems relevant to assess the specific impact of COVID-19 on Abeshge District's food system, from the perspectives of both food supply and food demand.

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In the International Organization for Migration's (IOM) (2021) ninth Ethiopian displacement report, internally displaced persons (IDPs) and returnee IDPs were found to be among the most affected groups in Ethiopia. In addition, the report found that 85% of the assessed villagers said that food costs had increased, affecting their capacity to buy food (IOM, 2021).

The food sector requires interventions to significantly protect the health of consumers. The interventions may range from minor to major. The Food and Agriculture Organization of the United Nations (FAO) works with countries to develop systems and capacities to prevent or mitigate food insecurity. Ethiopia has weak food distribution and marketing systems, so the pandemic is having adverse effects on its food supply chains (IOM, 2021). This threat is different from the emergencies that these populations usually face, due to its unprecedented global scale and the fact that it affects both food supply and demand.

In an exploratory survey, I looked at the effects of COVID-19 on the economy of the rural communities in the Abeshge District of central Ethiopia. Abeshge is a district in the Ethiopian Southern Nations, Nationalities, and Peoples Region (SNNPR) and is located in east-central Ethiopia. I conducted brief surveys of 130 households that were selected using a multistage random sampling method¹ using probability proportional to the size of the households that reside in the selected *kebeles* (small administrative units in Ethiopia). In this commentary, I share descriptive statistics from the surveys to describe the status of the food system during the COVID-19 pandemic.

Ethiopia in general and the Abeshge district in

particular implemented partial lockdowns, a state of emergency, social distancing, and crowd avoidance in response to the pandemic. While the measures could help mitigate health crises, they also could divert attention from the agricultural sector and negatively affect the district's food system by disrupting food supply chains. The survey in the Abeshge District was an attempt to assess the effects of COVID-19 on both the production and distribution aspects of the food system.

In the survey results, the most common challenge reported was difficulty getting food to eat after the COVID-19 outbreak (due to shortage of income, travel restrictions, or public transport limitations). The study reveals that rural agricultural extension networks can be used to disseminate information on health consciousness and training around both COVID-19 and agricultural activities. The formation of new networks on both the production and consumption ends of the food system can provide opportunities for policy change and advocacy.

COVID-19's Effect on Involvement in Food Production

The survey results revealed that before the pandemic, farmers were able to move freely to produce food on their farms and others. Only 38.3% of people were involved in food production during COVID-19 (Table 1).

Agriculture extension and advisory services also faced severe disruptions when lockdown measures were imposed, reducing farmers' access during this critical growing period. However, the survey results indicate the pandemic had a positive effect on food production for *some* farmers: those

Table 1. Food Production Involvement During the COVID-19 Pandemic, 2021 (N=130)

	Percentage of respondents				Total
	Low	Moderate	High	Very high	
Level of involvement in food production during COVID-19	38.3%	31.0%	10.7%	20.0%	100%
Level of involvement in food sharing during COVID-19	12.8%	48.7%	33.3%	5.1%	100%
Level of food consumption during COVID-19	10.3%	48.7%	38.5%	2.6%	100%

¹ In the first stage, five districts were randomly selected. In the second stage, one district was selected randomly. Finally, a total of 130 rural households were selected randomly using probability proportional to the size of households that resides in the selected district.

who received more agricultural extension services than before the pandemic, in tandem with experts disseminating information about COVID-19. Furthermore, farmers may have had additional labor on the farm, as some adult children came back home from cities due to economic inflation that was making their lives there economically untenable. In addition, rural agricultural extension networks were being used to disseminate information on health awareness and education about COVID-19 and agricultural production. This may provide short-term benefits as well as provide opportunities for longer-term collaborations.

A moderate level of involvement in food sharing during the COVID-19 outbreak existed for 48.7% of the population (Table 1). This was due to the healthcare directives from WHO and the Ethiopian minister of health, such as socially distancing and staying home.

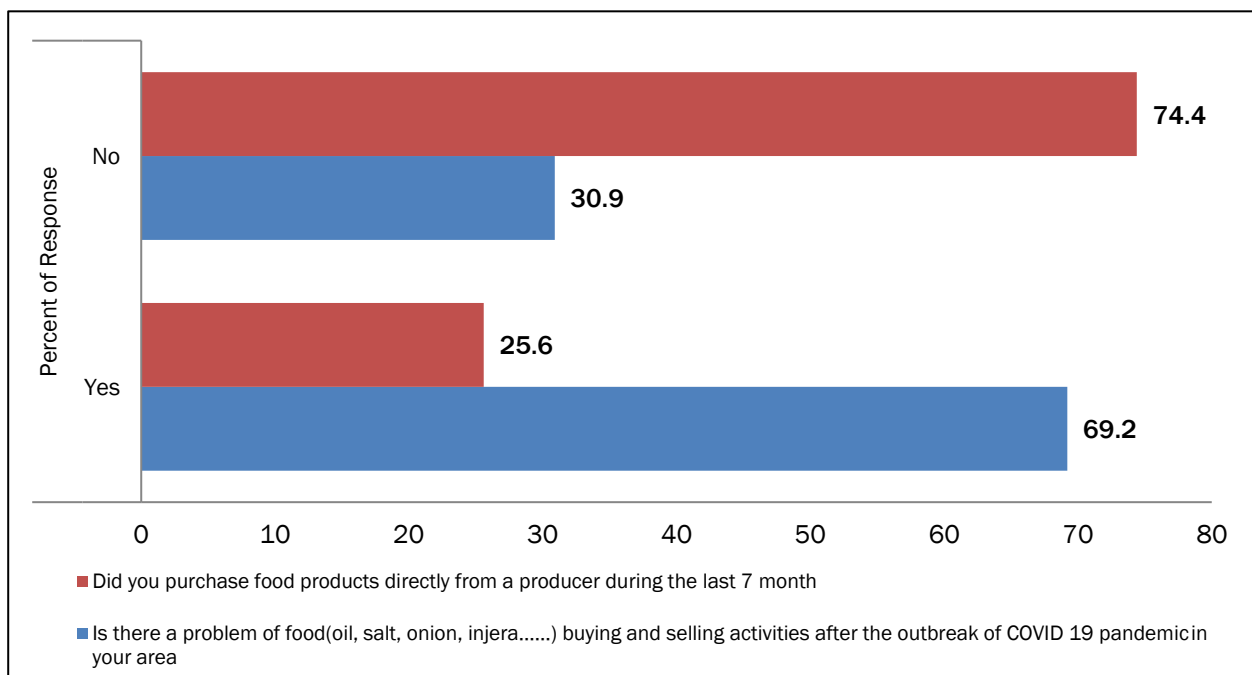
The survey reveals that farming activities were indirectly affected by labor shortages induced by COVID-19 lockdowns and the restricted mobility of people across borders. The unavailability of sufficient labor for periods of the peak seasonal labor demand for agricultural production contributed to reduced productivity in agricultural sectors. In the

study site, seasonal cereal-producing farmers faced difficulties because of the delay in sourcing inputs due to restrictions on the movement of goods. For instance, in the Gurage zone, about 53% of farmers who produce cereal crops were challenged by the delay of improved varieties, and as a result about 24% of them were using local seed varieties to fulfill their seed requirements in the 2020/21 production year.

COVID-19's Effect on Foodstuff Buying Involvement

After the outbreak of COVID-19, 69.2% of the population was unable to purchase food items (oil, salt, onions, injera, etc.) (Figure 1). On the other hand, 74.4% of the population indicated that they did not purchase food items from their suppliers due to the COVID-19 outbreak. Countrywide lockdown measures, including reduced access to markets, have resulted in job losses and have negatively affected poor people's income-earning opportunities, in turn reducing their purchasing power and pushing them to resort to negative coping strategies. This has widened the poverty gap. Residents also affected are those who work in the agricultural sector, including casual laborers

Figure 1. Respondent Involvement in Food Buying



(including migrant laborers), who support on-farm planting or harvesting activities; transport operators; petty traders; market vendors; and village-based loan and credit operators (Seidel et al., 2021).

The distance to farmers markets was limiting access to nutritious foods such as fresh fruits and vegetables for the urban poor. Job losses, combined with a drop in remittances, will limit households' ability to afford healthy diets and attend to basic needs.

High obstacles to buying food existed for 7.7% of the population. Of the respondents, 28.2% and 30.8% faced slight obstacles and moderate

obstacles, respectively, to buying food during COVID-19 (Figure 2).

COVID-19's Effect on Food Consumption Patterns

Figure 3 shows the main challenges reported: difficulty with respondents buying food after the COVID-19 outbreak (due to a shortage of income, travel restrictions, or public transport limitations) was the most common, followed by not enough to eat due to disrupted distribution, low demand, and difficulty importing, sourcing, or installing equipment in the study area. The respondents in the study area show there was a

Figure 2. Barriers to Buying Foodstuff During COVID-19

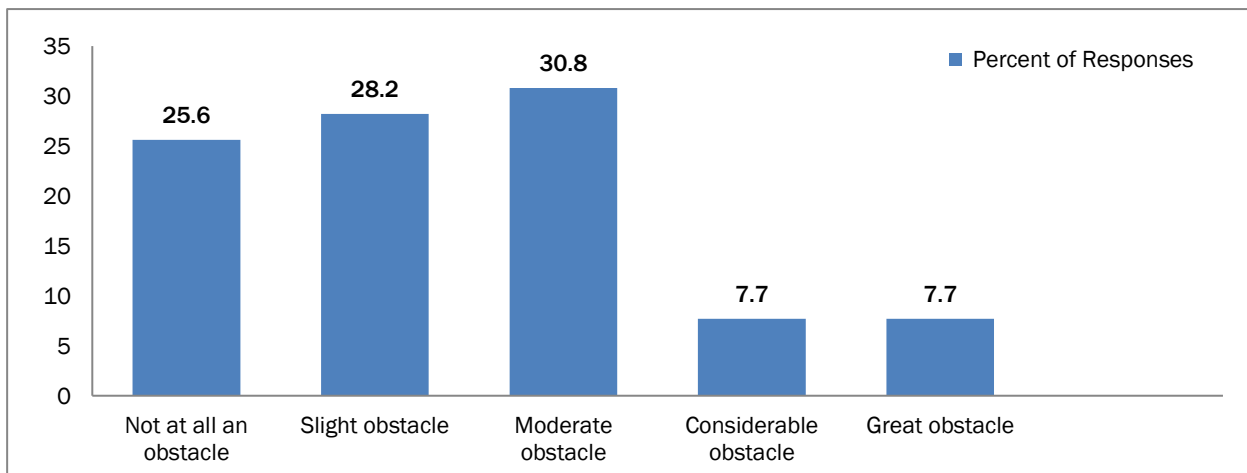
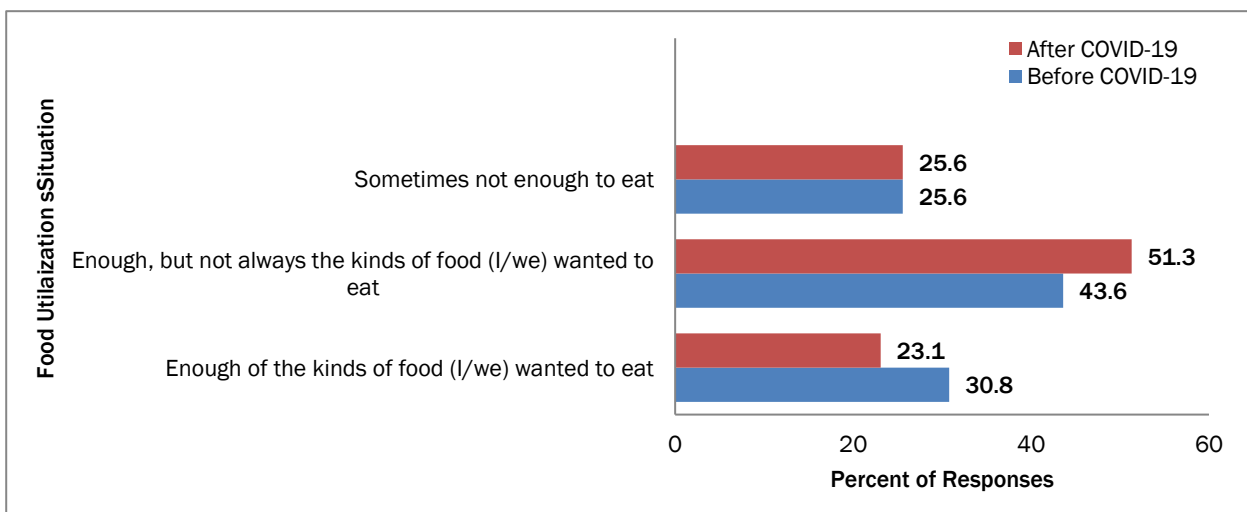


Figure 3. Food Consumption Patterns in the Household Before and After the Outbreak of COVID-19



difference between before and after the outbreak of COVID-19 related to their food consumption patterns.

Due to the shortage of income and the inability to afford and access food items near their residences, many residents were forced to go a far distance to buy food, which incurred additional transportation costs (Johanssen, 2021).

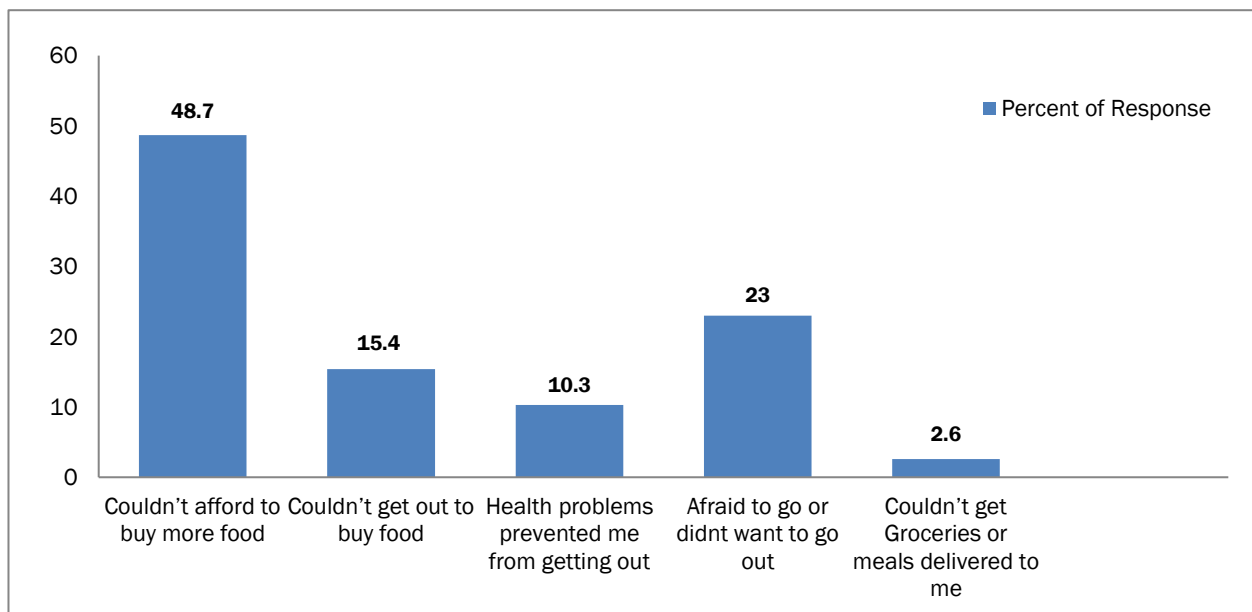
Figure 4 shows that the people in the study area could not buy food due to the global epidemic. The study indicates that being unable to afford to buy more food (48.7% of respondents) and the risk of contracting the disease (23%) were the major impediments to buying the needed food.

This commentary has revealed the most common challenge to getting food to eat after the

COVID-19 outbreak (due to shortage of income, travel restrictions, or public transport limitations). It has revealed that rural agricultural extension networks can be used to disseminate information on health consciousness and training around COVID-19 and agricultural activities. The formation of new networks on both the production and consumption ends of the food system can provide opportunities for policy change and advocacy.

Therefore, now and after COVID-19 abates, supporting farmers—who are fundamental players in food systems—to improve their access to and utilization of resources for the production and distribution of food products is vital in the effort to build sustainable food systems for all consumers.

Figure 4. Why Did You Not Have Enough Food to Consume?



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Ending Lacewing Acres: Toward amplifying microperspectives on farm closure

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Abstract

Farmers are invited to tell stories about their farms, especially about their farm's origin and history. However, some farm stories go untold, are uninformed, or become obscured, including stories of farm closures. With this case study, we invite journalists and academics to provide further opportunities for farmers to tell their own closure stories. Written by the farmer and her CSA member and friend, who researches farmer communication, this case study calls on farmers to tell their farm-closure stories in the complicated and robust ways such stories deserve. We draw on academic and public scholarship about farm closures and farmers' disclosures to feature how one farmer decided to end her farm and farming career. We chronicle her

decision-making process and her strategies to communicate the closure of her farm, as well as analyze themes from how audiences reacted to her news. We also offer a range of reasons for inviting such telling of complex closure stories.

Keywords

Case Study, Communication, Community Supported Agriculture, CSA, Direct Marketing, Farm, Farmer Storytelling, Farm Closure, Iowa, Vegetable Farm

Introduction

When farmer Julia Slocum thinks about her Iowa farm and the name she gave it, Lacewing Acres, she recalls the moment when she first learned of

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Author Note

The authors are personally involved with the farm in this case study, as the former farm owner and as a customer of the farm's CSA. This is fully disclosed in the body of the article.

the green lacewing as a beneficial insect. Julia, a co-author of this case study, came to understand green lacewings as ever-present creatures that she saw everywhere once she could identify them. The consistent visibility of green lacewings on her farm serves as a metaphor for the case study of farm closure featured here, reflecting how farm closures are ever-present once we notice them. As we detail in this case study, after seven growing seasons and many months of consideration, Julia decided to close Lacewing Acres in 2019. Such farm start-ups and closures shaped the landscape of vegetable farms in the Midwest and across the country. Noticing the closure of farms such as Lacewing Acres and listening to the narrative of its ending—a common outcome in farming—help us more fully understand how former farmers have important stories to tell. In what follows, we feature a literature review on listening to closure stories, detail our methods for conducting this research and writing up this case study together, and describe the context of Lacewing Acres and the complexities of Julia's closure decision. Lastly, we offer our results and discussion that address the stakes for telling such stories.

Our focus in this case study is on farmers engaged in direct sales, those who sell their crops and livestock at local farmers markets and networks of customers organized through community supported agriculture (CSA) arrangements. Such direct-to-consumer farmers are accustomed to chronicling the activity on their farms and telling cohesive narratives of their approaches to growing food. These farmers address audiences of their customers, potential customers, grant funders, and fellow farmers, among others. Doing so enables them to articulate the beneficial contributions these farmers make to their communities, persuasive claims about the benefits of local food, the impact that CSAs have on farmers and customers, their environmental orientation as reflected in their farms, and other information that their audiences want to know. Acknowledging its importance, scholars have begun to study the role that storytelling plays in farmers' lives and businesses, including how, through their storytelling, farmers can describe their farms, market farm tourism, perform informal teaching roles, and help others to under-

stand the issues they face, such as weather changes (Mei et al., 2020; Roche et al., 2019; Smith, 2014; Stockebrand et al., 2011; Torres, 2019).

Farmers' storytelling aimed at nonfarming audiences tends to emphasize positive aspects of farming, featuring brief vignettes of bucolic elements of farming, such as beautiful produce, happy farmers and their fellow workers, picturesque sunsets, bustling farmers markets, and other optimistic visions of local agri-food systems (Brookfield Farm, 2022; Civil Eats, n.d.; Cook, 2019; Hall & Gamble, 2017; Truelove Seeds, n.d.; Whole Foods Market, 2009; Wilkinson, 2019). While necessary to build a customer base and invite readers into the farmer's life and farm community, these positive depictions are stories that farmers choose to tell about themselves to shape a narrative about their farms and lives. When farmers write such stories, they might obscure farming challenges, such as the unpredictable and accumulating risks they face due to climate change, equipment needing repair, repetitive motion injuries, and other factors affecting their lives and work. Additionally, such stories often do not allow for nuance and complexity when the farmers are expected to edit out any material that does not affirm their audience's understanding of farming as a common good and farmers as honorable, stoic workers who do not complain. Farmers are thus invested in telling stories that meet audiences' presuppositions and curiosities and simultaneously communicate positive images of their farm and its offerings. Likewise, journalists and academic researchers ask farmers to tell particular stories, including those about their farm's origin, their motivations to embark on career changes or other life choices that led them to farm, and other narratives of prosperity.

In this article, we argue for telling a wider range of farm stories, particularly those about farm closures. We invite farmers to tell their own closure stories and call for journalistic and academic venues to host such stories. Although public audiences can access a wide array of farmers' stories about starting and maintaining their farms, a lack of platforms and opportunities for farm-closure stories means these stories go untold. Therefore, we feature Julia's strategies to communicate the closure of her farm and themes from audiences'

reactions to her news.

It matters that Julia's farm is in Iowa because her location shapes the stories she tells. As Brandi Janssen (2017) describes in her book on Iowa's small farmers, *Making Local Food Work*, it is difficult to overstate the importance of agriculture in Iowa, since nearly 100% of the original tallgrass prairie is now in agricultural production, enabling Iowa to grow more corn and soybeans than any other state—as well as produce seven pigs per human in Iowa (p. vii). Likewise, the Iowa State Extension Report (Harris & Iyer, 2014) on prairie conservation strips characterizes these dramatic changes:

Agriculture in Iowa owes its immense productivity to an extreme trade-off. Once, perennial prairie covered 85 percent of the state, and its deep root network built and held together a fertile topsoil layer many feet deep. Now, more than 85 percent is in agricultural production, with the majority in row crops. (para. 1)

Iowa's economy is thus dominated by infrastructures that support commodity-centric, large-scale, industrial agriculture, so Julia's farm did not benefit from well-established support or well-funded networks like it might have had in states with more infrastructure for small-scale vegetable farms, such as Vermont. That said, local food production continues to have an established presence in Iowa. In 2017 Janssen wrote that most Iowa farmers markets are thriving, a claim that future research may revise as the impacts of the COVID-19 pandemic and other pressures on local food producers increase.

We write from this Iowa context to invite conversations serving these three goals: to complicate bucolic myths about farming in the United States, to subvert capitalist logic depicting farm closure as mainly financial decisions, and to destigmatize farm closures in public discussions. To those ends, we begin with a literature review of the scholarly research and public writing about farm closure. Then we detail our methods and describe our case study of Julia's closure context and decision-making process before turning to how Julia communicated her closure to audiences connected to

her farm and their responses. Finally, to invite a broader and more diverse array of stories that reflect the complexities of how farmers closed their farms and ended their farming careers, we offer further considerations for telling and hosting farm-closure stories, as well as other ways in which the knowledge of former farmers can be harnessed for improving the prospects of those farming for local communities.

Literature Review: Farm Closure and Disclosure

People interested in the local-food aspects of agriculture have called for increasing opportunities to learn about farmers' efforts to grow food for their local communities. As farmers accept opportunities to disclose the challenges they face, narratives about farm closures are on the rise. For example, as Melissa and Andrew Dunham, owners of Grinnell Heritage Farm in eastern Iowa, disclose in their 47-minute interview on Iowa Public Radio (Nebbe & Harrop, 2020), climate change and a lack of infrastructural support were the primary motivations for closing their farm, a much-beloved and mourned resource in their community. Similarly, Glenn Sheeder describes the changes to downsize his family's dairy as caused by a multifaceted combination of his parents retiring from the business, barriers to hiring employees, and his inability to do all the work himself (Bacon, 2022). As Tom Philpott (2020) writes in *Mother Jones*, "we need more real talk about the failed individual-family model of farming" (para. 41), a model that is often propped up by undisclosed and invisible benefits such as inherited land. Such constraints and benefits can be hidden from consumers, who might not have information about the pressures that farmers face and the privileges from which some benefit and others do not, such as access to land and markets. Thus, because information about such systemic and infrastructural impacts is not often available to audiences and since less than 2% of the U.S. population works in agriculture (U.S. Department of Agriculture Economic Research Service [USDA ERS], 2021), closure news can be shocking, especially if a farm's public story has always been that of a bucolic, thriving farm.

Academic researchers encourage agriculture

producers to tell their stories and prompt increased listening to farmers (Rissing, 2019), dedicating entire journal issues to beginning farmers (Hilchey, 2010). While many farmers are accustomed to telling their farm's origin story and describing to audiences why they choose to farm, they might not be accustomed to telling the stories of how their farms end. Although farmers are often asked about their farms' origin stories throughout their farm careers, they typically only tell their closure stories when they announce their decision to close their farms. Further, whereas origin stories strike tones of optimism, closure stories may come with complex affective impacts, such as feelings of vulnerability, shame, anger, exhaustion, and other emotions that might arise in concert with those of elation and anticipation regarding new, postfarming opportunities. While farmers' truth-telling and disclosure are critical to our listening to and understanding their stories, not all stories are straightforward, welcomed, or easy to tell.

Likewise, audiences interested in and aware of local foods are familiar with listening to farm stories that describe the benefits of local food and farmers' intense physical labor, love of the land, contributions to their communities, and other narratives that shape farming as worthy and valuable. Such stories might make consumer audiences feel good about their buying habits because purchasing local food has been framed as an ethical, benevolent act. Since farmers tend to emphasize the positive aspects of farming that some audiences are primed to appreciate, these same audiences might be unaccustomed to farm stories that offer farmers' perspectives on the constraints they face. When such audiences become aware of farms closing, they might assume capitalist understandings of these closures as "failures," oversimplifying the meaning of a farm's end as occurring only because the farm did not make money. Such a singular focus could obscure the impact of the physical toll on the farmers or other factors related to vegetable farming (including competition from larger-scale vegetable producers who hold advantages regarding reliance on exploited labor, public water, and access to subsidized utilities). It could also downplay factors that contribute to any job change, such as burnout, boredom, or a shift in identity.

Further contributing to the disconnect between farmers and their audiences' understandings of closures is that few platforms exist for farmers to describe their decision to stop farming and close their farms. Sarah Mock (2021), a seasoned researcher and agricultural reporter who has studied farms, states that she is always struck by how rare it is to hear from farmers who ended their farms. Mock describes:

It's like we assume they died when the farm died, as if there's no one to offer insight about how farms decline or what lies beyond the end of a farm. But many of these farmers are still around and understanding their experiences can help us make sense of what's happening [on other farms]. (p. 35)

Both the individual and collective knowledge held by former farmers who choose to share their closure stories can be a rich resource that informs a more honest understanding of local food contexts and how they both enable and constrain farmers.

Inviting closure stories can provide context and richness to statistics about farms closing, enhancing representations that emphasize numbers over narratives. Statistics can aid our understanding of farm closures as they accumulate, helping us grasp the impact of broad changes to agriculture. However, they risk obscuring the varied individual circumstances that prompt farms to close. For example, these statistics published in the *Des Moines Register* might alarm readers:

Wisconsin, the nation's second-largest milk producer with 8,304 farms, had 634 fewer dairy farms in October than a year ago, data show. Over the past two years, the [state has] lost a total of 1,100 dairies. Iowa, the nation's 10th-largest milk producer with 1,150 dairy farms, has lost about 80 this year. (Eller, 2018, paras. 12–13)

These statistics reflect the crisis conditions of the dairy industry and are important to know. Such statistically driven stories might cause readers to feel shocked and concerned, but without the personal stories that illuminate the reasons and

impacts, they likely move on to other news stories. Such stories might also help perpetuate the deficit narrative that buttresses beginning farmer programs: that our country is desperate for farmers and that new farmers are answering this urgent call. Statistics-focused reporting that does not center farmers' stories in their own words can also obscure the farmer's perspective regarding the closure. Excluding farmers' viewpoints can lead to assumptions that farmers cannot do the work or are not "cut out" for it. Another risk of these statistics-focused stories, however, is that continuing to tell farm-closure narratives without including the complex contexts from which they arise obscures farmers' complicated decisions, keeping such decisions at the abstract level with big data. Interventions to address such abstraction can include increased opportunities for farmers to describe the complex contexts in which they stop farming. Farm-closure counts can thus be enriched through an increased public reporting of how and why farms close and the combined structural changes and individual circumstances that lead to such decisions. While we acknowledge that there is a purpose for such data-rich narratives, we are confident that they are being told (Farm Aid, 2020; Farm Bureau, 2021; USDA ERS, 2022).

Scholars have begun to study the complex web of factors that lead farmers to quit farming. Rissing (2019) conducted semistructured interviews with 14 people from 12 farms who quit farming within their initial five years, gathering data that suggest that a farm's "chances of success is a much more nuanced project than even the most precise book-keeping can capture" (p. 156). Rissing (2019) calls for an approach to understanding a farm's likelihood of success that is more detailed and diversified, and goes beyond simply focusing on finances, which are only part of a farmer's ability to thrive. Interpreting farming through a normative capitalistic lens, with its limiting emphasis on profit, does not prepare farmers to succeed in nonmonetary ways, such as in ownership, community, and operations, recognizing successes that could motivate them to want to keep farming. The 2017 National Young Farmers Survey concludes that land access is the top challenge farmers face, and lack of land access is the most likely reason they quit farming.

As the survey shows, this issue involves not only finding and affording land (Ackoff et al.), which can include financial barriers because land is expensive, but also zoning laws that discourage or forbid vegetable farming, and infrastructural boundaries, such as racist loan denials (Bustillo, 2021). Moreover, Goetz and Debertin's (2001) county-level study found that off-farm work increases the likelihood that farmers will stop working in production agriculture, but only after counties begin to experience a net loss of farmers (p. 1010). These results address the complexity of whether counties should invest in off-farm jobs programs that attract farmers when these programs lead to counties losing farms.

Writing for the public, former farmers build persuasive cases for paying attention to the stories of farmers' decisions to quit farming. For example, Weingarten (2016) illustrates the importance of listening to farmers' quitting stories:

However hard it is to discuss, the rate at which farmers are walking away from their farms—whether by choice or by force—may be the most important measure of whether or not our food systems are actually working. Because although farmers' markets are springing up everywhere, the average small-scale farmer is barely surviving. (para. 16)

In this context, Weingarten critiques the pastoral mythos of agriculture promoted by Wendell Berry and other oft-quoted writers who laud farmers who farm for "love"—against all odds. Instead, the shifting contexts in which farmers work need to be discussed and analyzed so that the systems that currently fail farmers can be changed to make farming possible. By contributing to such efforts, farmers can benefit from having a forum to share their stories of farm closure so these experiences can inform the next generation of farmers.

Likewise, Bren Smith (2014) argued for an infrastructural change to make farming possible, detailing the unfortunate truth about how farm-to-table dinners, restaurants serving local food, farmers markets, and other oft-praised contexts lauded by foodie movements seem to uplift farmers, but they often do not. Smith revealed ways that farm-

ers regularly do not benefit in these contexts because farmers market sales are too low, and independent farmers cannot always compete with well-funded, not-for-profit farms. By inviting such farming conversations, we enable greater learning about the constraints under which farmers work and provide opportunities to revise practices so that benefits to farmers can more fully match foodie movements' expectations—or at least revise the benevolent perceptions of these practices.

Methods: Case Study

To build a fuller understanding of farmers' lives and the range of reasons that farms close, this case study offers a microperspective of one farmer, Julia, and her decision to close her farm. As informed by scholarship in case study methods and storytelling (Porter, 2018), in this case study we offer this microperspective toward a better understanding of farmers' choices, the constraints and opportunities farmers face, and how farmers communicate their decisions. We especially take up Porter's (2018) case-study framework in two ways: First, we value the fact that we are authors from both the farmer community and a university to improve the accessibility and accuracy of our project (Porter, 2018, p. 41). In addition, we name that we are each a co-investigator and an actor in the work we are studying (Porter, 2018, p. 41). Throughout this write-up, we refer to Julia more by name since we are writing about her farm and her decisions, but we are committed to a shared understanding from our two perspectives: Julia's as the farmer and Abby's as the CSA customer and academic researcher who studies direct market farmer communication. Porter (2018) defines *rigor* as ethical, emotional, and epistemological. Our ethical stance is that farm closure stories are under-told, and we wish to intervene in increasing their telling. Our emotional position is that farmers deserve the dignity of having their stories heard and respected, as well as the notion that the research process can change researchers (Porter, 2018). We have both been changed by better understanding the emotional depth and vulnerability of Julia's complex decision process and the impact of telling those stories here. Epistemologically, we are committed to telling accurate stories about farmers' lives, a

practice that demands "more inductive listening and analysis, including in setting the boundaries of the case" (Porter, 2018, p. 41) as we have set ours to a single farm, Lacewing Acres.

In this case study, we describe Julia's farm, Lacewing Acres, and then disclose Julia's approach to telling people she planned to stop farming. We contextualize Julia's story in the broader context of farmers' decisions to stop farming and close their farms. This story is framed by expected narratives, such as Julia's farm-origin story, as well as the message she used to communicate closure in the letter presented below. Having established that framework, we summarize the strategies Julia used to inform her fellow CSA members and farming mentors that she was ending her farm and then analyze the themes that surfaced in responses from these audiences. We aim to broaden the understandings of farm closure stories and responses to them, and encourage increased opportunities for farmers to communicate such stories.

The catalyst for this collaborative case study is Abby's interest in farmers' rhetorical strategies and how they bridge divides between their work as farmers and their nonfarming audiences' understandings of agriculture. Abby moved to Julia's town, Ames, Iowa, in 2011 and signed up for Julia's CSA in 2014, Julia's second season of farming. As Julia and Abby became friends through the CSA relationship, Abby learned more about Julia's farm operation, the benefits and risks of farming in that community, and the complexities of the choices Julia made as an independent farmer. When, after a long process of decision-making, Julia decided to end the operation of Lacewing Acres, Julia asked Abby for advice on how to communicate this information to CSA members and others, noting that doing so felt awkward, complex, and personal. As Julia and Abby talked about how Julia would approach her messaging about an oft-silenced farm story, Abby proposed a collaborative research study to analyze the context together and write about it to engage broader audiences in the opportunities and challenges of telling farm-closure stories.

Our collaboration on this case study began when we strategized how Julia would tell her mentors and CSA members that she was ending Lace-

wing Acres. Once Julia knew she was ready to announce her decision, she consulted with Abby to consider options for communicating her farm closure to other CSA members and people who are invested in her farm, including mentors and those who had supported her farm in the past. Julia drafted messages she planned to email to these audiences, and Abby provided feedback regarding tone, organization, and other considerations. Julia wanted these audiences to hear the news from her directly. Like many farmers who sell their crops via CSA, Julia was accustomed to writing to members about what to expect in their CSA share each week, addressing challenges facing the farm, such as weather conditions, and offering recipes to help members use vegetables that might not be familiar to them. Writing to them about the end of her farm would initiate the end of their farmer-customer relationship and include other details, such as brief information about her reasons for stopping farming and the future of the land on which she had farmed, as well as about how they might find their next CSA. As we discussed, the letter should be brief, forefronting the important details and anticipating the immediate questions that CSA members would ask.

Reproduced in full below, the letter Julia emailed to her 148 current and past CSA members included the announcement and relevant details. She organized her closure story in two ways to see what responses were elicited. Seventy-six of the recipients received a version that began with a message of pride and gratitude about Lacewing, and the other 72 recipients (with five of those emails bouncing back undeliverable) a version that began directly with the closure news. In the end, the two different message openings did not elicit dramatically different responses, likely because Julia's recipients were most interested in her and her personal future, as they had become invested in and connected to her through her farm. We include only one of the versions below since the responses were so similar. We detail our analysis of these responses in the results and discussion section.

As Julia received responses to her email and had conversational interactions with recipients of her email whom she saw around town, she noted the general themes of the responses. Only Julia

read the emails and had the conversations, which she then summarized and told Abby about in person during their meetings. Because we were interested in the general themes of recipient responses and did not intend to quote from these responses, we have generalized that information thematically, not quoting from the email writers or individuals with whom Julia had conversations about her closure. We met in person to discuss the responses Julia was receiving and decided in 2019 that audiences interested in local food producers and the decisions they make about closing their farms would be invested in Julia's story and her experience of deciding to close, as well as in how she communicated it. We thus began writing up this case study and researching how it fits into existing scholarship on farmer storytelling and closure. Having analyzed Julia's generalizations of the responses together, we began writing about what we had learned through our analysis.

As the remainder of this case study shows, our analysis has led us to argue that farmers like Julia, who tell their farm-closure stories, do not fit into normative, pastoral narratives of farming because their stories destabilize bucolic agrarian myths and potentially put at risk consumers' understandings of supporting local farmers as a common good. This latter point—that local food systems are so vulnerable to consumer whims that transparency about farm decision-making and closure stories puts them at risk—deserves further attention because ignoring the complexity of a farm's "success" props up the monolithic agrarian, common-good story affirmed by obscuring the circumstances of farm closure. But the former point is the one we want to amplify through this case study—that destabilizing agrarian myths to show how they are incomplete and oversimplified can be productive for showing the complexities of farming experiences, which cannot be fully told through statistics and big data trends. We thus join with researchers such as Janssen (2017) who call for an inclusive and thorough approach to understanding the local producers' diverse and contradictory experiences. Listening to such stories is important because doing so invites farmers to describe the complexities of their decisions and can inform consumers and community members about the com-

plications of food systems and the unique constraints of farming as a job and lifestyle.

Case Study Context: The Process of Deciding to Stop Farming

Unlike farm-closure stories, the farm-origin narrative is a well-established genre, as we have identified, and we reinscribe it here with a particular emphasis on the farmer that shapes this case study. Co-author and farmer Julia Slocum opened Lacewing Acres in 2013, when she was 28 years old. Julia has a bachelor's degree in international studies and Spanish and worked for three years in Washington, D.C., for a nonprofit. Before opening Lacewing, Julia worked on three farms in New Mexico, Wisconsin, and north-central Iowa, including a goat dairy and creamery and two diversified vegetable farms. Julia gained access to land to establish Lacewing Acres by bartering with a local couple who operated a small cattle farm west of Ames. With them, Julia tilled about an acre (.4 ha) in the fall of 2012 to get it ready for spring, and she planted garlic that same fall. Spring 2013 was Julia's first season of farming on her own, having about an acre and a half in production. Starting with a 24-member CSA, she did home deliveries in her town. That first season she also sold vegetables to a retirement home, a technology company, and at the downtown farmers market every Saturday, as well as cucumbers to a coffee shop to use in their cucumber lemonade.

She moved her farming operation closer to town starting her third season. From the third through the seventh seasons, Julia sublet farmland from a friend who was growing 40 acres of organic corn and soybeans. The farm was also located adjacent to a vineyard. In addition to growing these crops, Julia's friend/landlord opened a brewery on the land he was renting that was adjacent to the land Julia was farming. This friend/landlord and her first landlord both played active roles in her support network because they had more growing experience and other resources they made available to her, including equipment and storage facilities. The land where Lacewing Acres was located does not have a home structure, so Julia lived in town (about five miles away). For five of the seven years, Lacewing was Julia's primary source of income. As

Lacewing grew and evolved, Julia continued to be the sole operator and decision-maker. In the seven years of running her farm, Julia grew over 40 varieties of vegetables and herbs.

Julia considered many co-occurring events as she considered the future of Lacewing Acres, a process that we chronicle here. To weigh the closure decision, she spoke with farm mentors and her friends who were currently farming or had farmed in the past. Julia had thought about stopping farming off and on over the years, specifically in the context of pondering what she wanted to do with her life. Especially in the winter, when Julia was not fully occupied by the day-to-day activities of keeping the farm going, she would think about her goals beyond farming. Over time, she came to realize that achieving those goals became increasingly unlikely if she continued to farm. In 2019 she finalized her decision to close the farm and announced that she would stop farming.

The decision process began much earlier, however, as Julia began to seriously consider closing Lacewing Acres in 2018. Her motivations to change what occupied her time accrued, including her growing interest in moving to a different community and achieving other personal and professional goals, such as shifting to a career focused on mental health. In addition, she briefly experienced a back injury, and her knee had begun to cause more discomfort from farm labor, which prompted her to reflect on the long-term impact of farm labor's relentless, repetitive motions. Specifically, when she had near-miss moments during farm work—including slipping off the tractor, hitching up an implement imperfectly, or an having an awkward movement with a harvest knife or power tool—she became more acutely aware of how much her operation relied on her physical wellness and how incredibly vulnerable that made her continuation. This vulnerability was wholly connected to the farming model Julia practiced, where she was the sole decision-maker, farm operator, and laborer. Even when she had part-time help harvesting or doing other farm work, no one else contributed to managing the overall farm or the business. Thus, Lacewing Acres relied entirely on her physical body and mental acuity.

Julia's decision to stop farming was also related

to the size of her farm business and how it positioned her in a capitalist system that poorly compensates agricultural workers such as vegetable farmers. She felt caught in an awkward phase of the operation: The farm was too small for her to make a living wage, but she was both unable and unwilling to increase production or add employees to try to make more profit. Julia found herself in a cycle of working all summer on the farm and then doing various other jobs all winter, an unsustainable combination that came with financial insecurity even though she was working off her farm a great deal. Coupled with this cycle were the pressures of increasing anxiety about needing Medicaid and the Supplemental Nutrition Assistance Program (SNAP). One contributor to such anxiety was the complex and intrusive paperwork required for such programs that scrutinized her life, as well as the offensive materials included with her SNAP mailings, such as information promoting the financial benefits of marriage. Julia felt guilty because she knew that farming was a choice for her and she was entirely capable of doing different work for which she could make a living wage. This guilt only heightened the complexities of needing such resources while also working long hours.

Julia's status as a single person also contributed to her decision-making process about closing Lacewing Acres. She was discouraged by how few single people were farming. On one hand, nearly every other single farmer she knew had a partner with an off-farm job, had come to farming with savings to live on, or was farming on family land. Knowing that other farmers had such financial and land-based infrastructures undergirding their operations made her feel both overwhelmed and isolated, as if she were one of the only farmers in her community who was farming under these intense conditions as a single farmer responsible for all the work, decisions, and risk. On the other hand, she knew the strain farming together had on romantic and business partnerships. Farming alone meant she did not have those challenges.

That said, Julia's intense pride in her accomplishments as a farmer was also directly connected to her independence in farming on her own. She had been drawn to farming initially, in part, in the way other people might take on marathon training

or some other lofty goal to challenge themselves—she was not sure she could do it, so her motivation to try increased to prove that she could. After five years, Julia had shown herself that she could do it, so she had accomplished her mission and removed any doubt that she was capable of running her own farm. While farming enables farmers to learn new skills and experiment with unpredictable outcomes, she began to crave a different set of challenges that would test her in unfamiliar ways. Increasingly, she had a sense that there were other skills and questions that were more personally urgent and relevant to her. Such questions included considering what helps people be emotionally well and how to listen and question ourselves and one another to cultivate this wellness. Julia became drawn to focusing her efforts in that direction rather than on the day-to-day problem-solving around managing the farm.

Julia was also inspired by former farmers in her community and friend network who had recently transitioned to other occupations and several non-farming peers who were making life changes and embarking on new career paths. These friends were going to graduate school, changing professional fields, and moving to new places. She was curious about the possibilities such a shift could bring for her.

Considering her community of farmers also contributed to her decision in other ways. Mock's (2021) description—that farmers disappear or “die” when their farms end—resonated with Julia. She acknowledged the mental obstacle she faced when considering whether to stop farming: feeling like she would essentially die to her community when her role changed from farmer to former farmer. Because her community of customers cared about her as a farmer and supported her in her labor of growing their food, she anticipated that their care and support would disappear when her farm no longer existed. In addition, her community of fellow farmers was rooted in their shared occupation, and Julia was concerned that she would lose her closest friend network that had grown out of her farming community.

Julia's farm created immense social security for her. Having a tangible, desired thing to barter with for labor, repairs, food preservation, and more was a massive nonmonetary benefit she did not want to

sacrifice. Moreover, the social connections created many opportunities for additional income through odd jobs (childcare, house-cleaning, house-sitting), as well as a sense of communal support. She knew that this network would support her in her goals. For example, in 2017, she took a trip with Witness for Peace to meet with small farmers in Oaxaca, Mexico, to learn about how U.S. economic policies affected their farms (Solidarity Collective, n.d.). Thanks to the community she had cultivated through Lacewing Acres, she raised over US\$3,000 in less than 48 hours to support this trip. That demonstration of support helped her feel that despite the financial insecurity of the farm, she had other forms of security. Julia found it challenging to face stopping farming, then, because she felt like she was walking away from this social safety net that she was mutually invested in with her community members. Thus, the closure considerations Julia made came with complex understandings of self, community, identity, and role.

Another factor that shaped Julia's decision to close the farm was how much she missed nonfarm outdoor time in natural areas. Exploring parks and hiking trails is important to Julia, but her farm demanded all her time in the spring, summer, and fall, confining her to one outdoor space with constant work. While she found Lacewing Acres to be beautiful as a landscape, and she had chosen farming for its outdoor setting, she craved other views as well and wanted to go camping, kayaking, and hiking to witness other landscapes. While initially she had planned to work the farm during the growing season so that she could travel a bit in the winter, she ended up cleaning houses and doing other wage labor in the winter to stay afloat financially.

Julia's identity as a farmer also played a significant role when deciding to stop farming. She realized that she wanted to disconnect her personal identity from her identity as a farmer, an identity she had taken a long time to cultivate and embrace. Since she had not grown up on a farm, she began Lacewing Acres with a strong sense of imposter syndrome—feelings of inadequacy and self-doubt—which lasted the first few years. Then, when she eventually felt comfortable calling herself a farmer, she pondered her decision to stop farming, prompting her to wonder what was left of her

identity if she no longer farmed. Letting go of the identity she had worked so hard to embody took time and deep personal reflection.

When Julia began to feel comfortable talking to farmer friends about how she was considering closing her farm, she received reassurance from a fellow beginning farmer that their friendship went beyond their shared occupation. Knowing that ending the farm would not end their relationship as friends helped Julia, assuaging her concern that quitting farming would cause her to become socially isolated. Because farming is so encompassing, and Julia's social community was centered around farming, she was concerned that the community she had invested in and played a major role in building would vanish as her identity shifted from that of a farmer. Because it was scary to risk severing her ties to her community, such concerns delayed her decision to quit for a long time.

Julia started working at her town's public library in 2018, a job she still holds, and this job also contributed to her decision-making because it eased her transition into new professional and community roles. Because her job is customer-service oriented and she works with other library staff members, she began to meet new people. Julia found getting her paycheck to be "magical," and even though her new medical benefits plan is expensive, the emotional relief of not needing to rely on Medicaid remains considerable. Additionally, Julia pursued career counseling, which reinforced her confidence that there were other professions that would allow her to draw upon her multiple strengths in other contexts.

With these many factors in mind, Julia decided to announce her decision with a letter she emailed:

Dear past and present CSA members,

At the end of this year it will have been seven full seasons running my own small farm, and two seasons apprenticing before that. That's over 5000 CSA boxes delivered to the Ames community! Some of you have been with me since the beginning! It has been an incredible, empowering, and humbling experience. Thank you so much for your support!

After almost a decade of vegetable farming, I've had a growing desire to explore some other interests, diversify my skill set, and take better care of myself. I've been planning to let you know for a couple of months now that I have decided that this will be my last season running Lacewing Acres. I'm looking at going back for graduate studies, but we'll have to see how things unfold.

You are welcome to contact me with questions, though my response may be a bit delayed given the time of year.

The folks at Alluvial [the brewery owned by Julia's landlord/friend] and I were all eager to find someone to continue farming on the ground I'm currently renting, and are in conversation with another local grower who is considering starting their own operation next year. I will share any possible 2020 CSA information as soon as plans firm up. One reason I wanted to tell you early in the season is so that you'll have the opportunity to keep an eye out for other CSAs in the area, and maybe even talk to some of the farmers at farmers' markets to get to know them and learn more about their farms and growing philosophies. Some resources for finding a CSA in 2020 include Iowa State's CSA directory, PFI's [Practical Farmers of Iowa] local foods directory, and Local Harvest.

Wheatsfield [a local food co-op grocery store] also hosts an annual CSA Fair in January or February, so stay tuned for that. I hope you'll find another CSA home in 2020 and in the years to come. Your support of local food and local growers is needed and appreciated.

Sincerely,

Julia

Julia's announcement begins with an enthusiastic tone, describing both her accomplishment in the amount of food she has been able to grow and her gratitude for the support that her customers have provided. Then in the second paragraph, she transitions to the important message of the letter,

her farm closure. She describes how the end of her farm means the beginning of other opportunities. She also discloses that she has taken time to make this decision, implying that she is not open to readers trying to change her mind. She ends by striving to secure her readers' commitment to the CSA model, hoping that the end of their relationship with her farm will not mean the end of their investment in a local farmer.

Responses to her closure letter came to her email inbox as well as through in-person interactions when a recipient saw her around town before responding to her email. All responses were encouraging and enthusiastic. They reflected the community that Julia had created around Lacewing Acres, as several email respondents offered invitations to get together at the end of the growing season. Two individuals separately asserted in-person to Julia that making a living as a farmer was too challenging. Since Julia does not mention the economic context of farming in her message, these interactions that mentioned "making a living" reflect others' external reasoning for closure, not Julia's own reasons she describes. During in-person conversations, Julia was more likely to be asked for more information regarding the "why" of her decision, questions that sometimes happened unexpectedly. These people seemed to want to acknowledge Julia's announcement, at times apologizing for not having responded to the email. Julia's email announcement also prompted recipients who had moved away from her community to reminisce about her CSA and its abundant size and great variety, and praise her farming skill and express support for her decision. One reader asked for her advice on making farming more sustainable, acknowledging that Julia probably did not have time to answer such a broad question but positioning her as an expert who could provide such answers. Several recipients also brought up the physical intensity of farming and the toll that such physical labor takes.

Results and Discussion

People want to understand the complexities behind why farmers quit farming. We can conclude from recipients' reactions to Julia's closure letter that nonfarmer audiences can understand that a range

of reasons contributes to a farmer's decision to stop farming. Further, these recipients showed eagerness to stay in touch with Julia even though she was no longer growing food for them, illustrating that the farmer identity that Julia so carefully built and presented to this group of mentors, fellow farmers, and CSA members created relationships that existed outside of farming and food sales.

Julia's closure story, with all these contributing factors and considerations, discloses the complexity of her decision-making process, which took into consideration both the structural conditions of a small-scale farmer as well as her own personal circumstances. She had to consider financial and physical challenges, the ways in which being a farmer eclipsed all other elements of her identity, the long-term effects of being unable to balance farming with desired hobbies, the ongoing tension between feeling very accomplished as a farmer and feeling like she could not handle farming, her desire to pursue new challenges, and her realization that her skill set and interests could also be suited to other careers. While farmers might feel pressure to tell stories of their farms that are simple and easy to understand, Julia's decision to close Lacewing Acres is complicated and cannot be reduced to one or two reasons, such as the intense physical labor required of vegetable farmers or the difficulty of "making a living" as a vegetable farmer in a corporate capitalist culture. To do so is a disservice to farmers and their audiences because such singular narratives oversimplify the complexities of farm decisions and their high stakes for farmers' lives and identities. The causes of farmers' closures are varied, messy, and evolving, but unless their stories are told in all their complexity, people will never grasp the bigger picture of why many farms end.

The reasons for telling these stories are varied. For example, telling such stories opens up consideration of whether small, direct-market farms are the answer to the challenges posed by weaknesses in the U.S. food system. Perhaps these farms are one answer to having a resilient local and regional food system, but their operators should not bear the weight of solving comprehensive food-systems problems. As a farmer friend of Julia's once told her, the path to being "successful" with a small

vegetable farm is narrow, as there are limits and boundaries to these farms' success.

Another reason why these stories matter involves a broader social issue about farming as a public service. An increasing interest in this public service aspect—and its growing importance over economic value and profitability—can be found in the work of scholars such as Michael Symons (2020), who claims that economies of food must be reconceptualized; to do so means "reimagining people as wanting not rational gain but table-pleasure, not rewards and expenditures but complex communities, not disposable resources but a precious world" (p. 46). In this line of argument, small-scale farmers have an essential role to play. Like other public service workers who perform skills and expertise that are fundamental to our society and thus are thought to not need to generate wealth (e.g., teachers, social workers, healthcare workers in a nonprofit context), farmers do work that needs to be done and, therefore, should be supported as a social resource. A move in that direction could alarm those farmers who resist regulation and training requirements, since those requirements can mean the loss of some kinds of "freedom" that they see as core to their farming identity and occupation. A move to new models that subvert capitalist drives to profit comes into focus when listening to farm-closure stories because they expose how small farms cannot solve all food-systems problems. Telling closure stories can contribute to having more honest conversations about the human costs and true sustainability of this sort of local and regional food system based on small producers that the local food movement advocates.

Another reason for listening to closure stories might be to normalize closure. Audiences can consider whether it is acceptable for farming to be a job that a person jumps into and does for a decade and then moves on to something else, rather than being a lifetime career. Such a revised understanding of farming as perhaps a temporary job prompts considerations of how our country needs more structures in place to accommodate this model, such as community farms that hire farmers as employees for an operation in which the land, equipment, and support network are all provided

upon hire. Such a model, however, could also lead to less independence for farmers, which many would resist or find unattractive. Overall, then, the reason for better understanding the complex stories of farm closures is because they reflect how U.S. policy and agricultural infrastructure make small producers vulnerable in ways that might be revised infrastructurally so that individual farmers are not held accountable for factors they cannot change.


Conclusion

In 2014, a few days after Bren Smith's op-ed advocated for systemic change that would make farming more accessible, the *New York Times* published four letters to the editor in response to Smith's article (Letters to the editor, 2014). These writers disagree with Smith and reject the notion that farmers face infrastructural barriers that necessitate destigmatizing farmers' quitting. One writer claimed to be "heartbroken" about Smith's essay, and others asserted that off-farm income should be normalized so that farming is not understood as a primary source of income. These writers' responses attempted to reestablish positive outlooks for agriculture, illustrating how invested in the promise of farming many continue to be as they reject Smith's experiences and proposals for change. While it might not be surprising that resistance is prompted in response to Smith's truth-telling and assertions that farming is systemically broken, these reactions call for the need to tell more narratives like Julia's and to create opportunities for a richer, more diverse range of stories reflecting the circumstances and challenges of farming. We invite more revealing stories to better enable understanding of the complexity of farm closures.

This case study offers an invitational counterpoint to the statistics-rich accounts of farm closure common in reporting agriculture trends in the United States. Our goal is to contribute to an awareness of these stories' grace, subtlety, humanity, and sensitivity and create opportunities for more complex farm stories to be told. We ask farm publications to consider publishing more sensitively presented closure stories, perhaps including one closure story per issue that features multiple beginning farmer stories or publishing several blog

posts per year that invite closure narratives.

Similarly, beginning farmer organizations can actively maintain contact with farmers who have stopped farming to invite them to tell their stories in their own ways or to serve on the organizations' boards or lead workshops. During one of our conversations, Julia mentioned that none of the farm organizations to which she had belonged as a member has contacted her about her decision to stop farming, a potentially missed opportunity for them. Willing former farmers like Julia could be included in a database of farm mentors for other farmers, and such organizations that support beginning farmers could develop other pathways more actively for new and current farmers to connect to former farmers to benefit from their knowledge and support.

Of course, some former farmers would not want to participate in such relationships or publish their closure stories, but creating pathways for those who do could be built into the normative activities of organizations that support farmer networks. Such networking communities that bring together current and former farmers would likely develop more creative approaches for telling complex closure stories. We hope for a future that invites the telling of farm-closure stories robustly in the complicated and nuanced ways they deserve to be told. A more complete perspective on the broad landscape of agriculture in the United States that encompasses a complex spectrum of closure stories can illustrate how former farmers came to their decisions, as well as the unique factors that impacted their farming, and, in turn, can counter oversimplified narratives about why farms end. Overall, inviting and amplifying closure stories contributes to creating a more accurate picture of farmer experiences and normalizes a process that is now too often stigmatized. 

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A qualitative investigation of resilience among small farms in western Washington State: Experiences during the first growing season of COVID-19

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Abstract

The 2020 growing season presented new and significant challenges for farmers and farms across the United States as they navigated the COVID-19 pandemic. The rich and diverse agricultural landscape of Washington State offers a valuable micro-

cosm in which to explore the experiences of farms in the U.S. during the pandemic. The purpose of this study was to qualitatively assess the impacts of the COVID-19 pandemic on directly marketing small farms in western Washington State, with a focus on farmers' experiences with resilience. We conducted in-depth, semi-structured interviews with 15 farmers and used thematic analysis to explore the influence of the pandemic on overall

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experiences, responses, and values and perceptions related to small farms. Interviewees provided insights on the impacts of the pandemic on their daily farm operations, production costs, marketing channels, demand, and revenue. Farmers also reported shifting personal and public attitudes towards small farms during the pandemic. Product diversity, flexibility, multiple forms of support, values, and access to resources emerged as drivers of COVID-19 impacts and farm adaptations. When compared to existing frameworks on farm resilience, farms in this study are seen to demonstrate resilience via buffer and adaptive capabilities, which enable them to absorb and adjust to shocks. Farmers also discussed resilience via transformative capability, the potential to create new systems, leveraging the collective power of small farms to shape future food systems. Future research on the resilience of small farms should focus on ways to both promote resilience attributes and facilitate the ability of farmers to act on resilience capabilities.

Keywords

COVID-19, Pandemic, Farm, Washington State, Impact, Resilience, Values, Interview, Qualitative, Small Farms

Introduction

The 2020 growing season presented new and significant challenges for farmers across the United States as they navigated the first year of the COVID-19 pandemic. Experiences at the farm level played out against the broader backdrop of the U.S. food system, where well-publicized disruptions painted a picture of a system in crisis (e.g., Hobbs, 2020; Inslee, 2020; Klassen & Murphy, 2020; Kulish, 2020; Lewis, 2020; Lusk & Chandra, 2021; Reiley, 2020; Weersink et al., 2020). However, the impacts of the pandemic varied by sector and scale (Reiley & Reinhard, 2020; Ridley & Devadoss, 2021; Thilmany et al., 2020; Weersink et al., 2020), and the overarching narrative of a struggling food system does not fully capture the varied experiences of farm businesses in the U.S. While many indeed faced disruptions, some were also able to nimbly adapt to the changing business environment by, for example, pivoting their market channels to community supported agriculture

(CSA) programs, farm stands, or online platforms (Lemos & Ackoff, 2020; Local Food Research Center, 2021). In surveys exploring the financial repercussions of the pandemic, some farmers reported impacts including decreased revenue, but others reported increased or unchanged revenue (Dennis et al., 2020; Seidel et al., 2021; Stabiner & Barber, 2020). Such varied and sometimes strikingly divergent impacts of the pandemic on farm operations and finances suggest that further exploration via in-depth, qualitative research is necessary to more fully characterize the experiences of farm businesses during COVID-19, particularly as they relate to farms' different approaches to adaptation and the different manifestations of resilience displayed.

Across numerous sectors, including farming, the shock of the COVID-19 pandemic has afforded an unexpected opportunity to study the resilience of complex systems in real time (e.g., Darnhofer 2020; Haldane et al., 2021; Hobbs 2021), strengthening connections between theory and application. The concept of resilience was originally popularized in the field of ecology and described by Holling (1973) as the persistence of relationships within a system; a resilient system therefore, is able to absorb disturbances and still persist in its function (Holling, 1973). Resilience at the farm level has been conceptualized as consisting of a combination of buffer, adaptive, and transformative capabilities. These capabilities can be understood as active processes that, respectively, allow farms to absorb shocks without major changes, adapt to shocks, and make significant changes in response to shocks, essentially creating new systems (Darnhofer, 2014). This serves as a useful conceptual framework for understanding the behavior of dynamic systems—including individual farms—during shocks and ongoing disruptions such as those caused by the COVID-19 pandemic. At the same time, deepening our understanding of sources and drivers of farm-level resilience is of paramount importance to broader goals of enhancing food system sustainability (Tendall et al., 2015). In light of growing sentiment that small farms in particular have an increasingly important role to play in contributing to a national food system that is resilient, sustainable, and just (The Civil Eats

Editors, 2021), there is notable value in examining the ways in which the pandemic has revealed different forms of resilience at work across diverse types of small farm operations.

As a highly productive and diverse agricultural region—one whose geographically and climatically heterogeneous makeup supports a range of agro-ecological systems and related supply chains (Washington State Department of Agriculture, n.d.-a)—Washington State serves as an excellent microcosm to explore the varied experiences of farms during the pandemic. There is also pressure on the state's food and agricultural systems to adapt nimbly and proactively to future challenges such as those posed by a changing climate (Vallila-Buchman & Byrne, 2019; Yorgey et al., 2017) and to translate lessons learned during the pandemic into measures that enhance preparedness for future disruptions and build overall resilience (Otten et al., 2021; Vallila-Buchman & Byrne, 2020). Early reports confirm the magnitude of impact experienced by farms in Washington State, with nearly 70% of respondents to a survey conducted following the first quarter of 2020 seeing a decrease in revenue during that period (Moore, 2020). Great heterogeneity of experiences is also evident, with a different survey conducted at the end of 2020 finding that some Washington farms saw revenue decreases while others saw increases, and some increased production volume while others scaled back. Some grew their customer base while others saw it shrink. Factors such as farm size, marketing scale, and type of production appear to influence these conflicting experiences and actions (Collier et al., 2021; Otten et al., 2021). However, the degree to which surveys can explain the underlying causes of such phenomena can be limited. Specifically, a knowledge gap remains related to the sources of variation in impacts experienced and resilience exhibited, and this is a gap best addressed through qualitative study.

The purpose of this study is to qualitatively assess the impact of the COVID-19 pandemic on directly marketing small farms in western Washington State, with a focus on farmers' experiences with resilience. In-depth, semi-structured qualitative interviews were used to explore farmers' experiences in a way that complements quantitative data

collection among this population (Collier et al., 2021; Moore, 2020). Direct sales, including those to consumers (e.g., through CSAs, farm stands, U-pick, and farmers markets), restaurants, grocery stores, co-ops, food hubs, and institutions such as schools, constitute approximately 16% of all agricultural sales in Washington (U.S. Department of Agriculture National Agricultural Statistics Service [USDA NASS], 2017b; Washington State Department of Agriculture, n.d.-b). Many direct marketing channels were among those most immediately and heavily impacted both positively and negatively by the pandemic (Otten et al., 2021). Examination of the experiences and actions of direct-marketing farms may therefore illuminate diverse sources of impact and drivers of resilience at the farm level. Furthermore, small farms, defined as those with annual gross cash income under US\$250,000 (MacDonald, 2021), constitute nearly 90% of all farms in Washington (USDA NASS, 2017a) and are particularly prevalent in the western part of the state (Ostrom & Donovan, 2015). Yet despite their large numbers, small farms tend to be an underserved and underrepresented segment of the Washington agricultural industry; they have been historically excluded from some forms of federal financial support and, unlike large commodities, are not typically represented by a commission or other regulatory body (M. Moore, personal communication, June 29, 2020). Exploring the experiences of small, direct-marketing farms in Washington State thus also has the potential to fill knowledge gaps for agencies and organizations that respond directly to farmer needs and operate primarily at the state level.

Methods

Sampling Strategy and Recruitment

Fifteen farmers were recruited to participate in semi-structured qualitative interviews to document the experiences of their farm businesses during COVID-19. Farmers were included if they were over 18 years old, had been a farm owner or operator in Washington State for at least one year prior to COVID-19, had a farm income of US\$250,000 or less, and participated in some form of direct marketing (e.g., on-farm sales, farmers markets,

CSA, agritourism, food hubs, direct-to-restaurant, direct-to-institution, or other forms).

Participants were recruited beginning in August 2020, and interviews were conducted via Zoom (Zoom, Version: 5.7.4 (804)) through October 2020. Initial recruitment targeted agricultural professionals and was distributed via email to the Washington State University (WSU) Food Systems listserv and sent directly to county conservation districts, farmers market managers, and WSU extension offices across the state. Recruitment materials explained inclusion criteria, the Zoom format, estimated duration of interviews, scheduling logistics, and that participants could win one of three US\$100 e-gift cards. Recruitment was supplemented with direct outreach via email to farmers in late September. The study team identified potential farmers via emails and phone calls to farmers market managers, farmers market vendor lists, as well as the WA Food & Farm Finder online tool (Eat Local First, n.d.).

Participant Characteristics

Interviewees operated farms in King ($n=5$), Whatcom ($n=4$), Pierce ($n=1$), Lewis ($n=1$), Pacific ($n=1$), Skagit ($n=1$), Clark ($n=1$), and Island ($n=1$) counties, all of which are in western Washington (west of the Cascade Range of mountains, which divide the state). Farm size ranged from 0.25 to 65 acres, with an average of 22 total acres. Most interviewees (66%) reported a typical gross farm income of less than US\$50,000, though this ranged from less than US\$10,000 up to US\$250,000. Ten interviewees (66%) reported producing more than one agricultural product; the most commonly produced items included vegetables (80%), tree fruit (40%), meat including beef, pork, and lamb (40%), poultry meat (27%), and eggs (20%). Other production items included berries, cut flowers, dairy, grains, hay or silage, honey, and nursery items. Three interviewees reported that agritourism or educational activities were a key part of their farming business. While the sample population overrepresents producers of vegetables, fruits, and animal products relative to overall totals for the state (USDA NASS, 2017b), these proportions reflect the higher likelihood of direct-to-consumer marketing among these product categories identi-

fied by Plakias et al. (2019) in a study of direct-marketing farms. The sample population reflects the majority-white racial/ethnic makeup among small farms in Washington State (Table 1). However, it should be noted that many of the non-white racial/ethnic identities present at lower frequencies among the state's farm population are not represented here. The sample population skews slightly more female and younger than all small farmers in the state. It includes notably higher proportions of beginning farmers and individuals for whom farming is a full-time occupation (Table 1). Beginning farmers have been found to be more likely to engage in direct-to-consumer sales (Plakias et al., 2019), and thus this differentiation between the study population and overall small farm demographics in the state is in keeping with this study's focus on direct-marketing farms. It should also be noted that the agricultural census data to which sample population characteristics are compared in Table 1 include data on up to four producers per farm, whereas interviewees for this study were typically the primary farm operator, which may affect the likelihood of reporting farming as a full-time occupation. These details about farmers and their farms are provided to assist the reader with assessing the transferability of study findings to other settings (Guba, 1981).

Data Collection and Analysis

The semi-structured interview guide explored five major topics: (1) basic information about the farmer, (2) basic characteristics of the farming operation, (3) how farmers were affected by and responded to the pandemic, (4) farmers' ability and/or need to respond to the pandemic, and (5) values and perceptions related to small farms and farming. All interviews were conducted in English; while Spanish interpretation was available, recruitment materials (including information about the availability of interpretation) were only distributed in English. The interviews were recorded and transcribed using Zoom software and uploaded to a secure server. Recordings were reviewed to manually correct transcriptions for accuracy.

The data were organized and analyzed using Atlas.ti software (Atlas.ti, Version 8.4.25.0). Two researchers completed a first pass of line-by-line

coding of three interviews (20% of total interviews) to ensure codebook validity. In total, three passes of line-by-line coding were completed, and the code book was iteratively adjusted with each pass. The study team took an emergent approach to the thematic analysis and initially created codes, categories, and themes based on the experiences and reflections of the farmer-interviewees. The final codebook contained 168 codes, 27 code categories, and 9 themes (Appendix A).

Interviews were conducted and coded in the same phase of the study, and analytic memos were kept throughout the process (Saldaña, 2009). Co-coding and peer debriefing were used throughout the study to increase the credibility and dependability of the findings (Thomas & Magilvy, 2011). As

the number of interviews completed approached 15, few to no codes were added to the code book, suggesting data saturation had been reached (Fusch & Ness, 2015; Guest et al., 2006; Mason, 2010). By using in-depth, semi-structured interviews, this study was designed to invite and document depth of experience—another important aspect of data richness (Fusch & Ness, 2015; Guest et al., 2006). Time of year also influenced when to end the interview process. As the end of the growing season neared, farmers began commenting more on future seasons and the overall tone of the interviews began to shift, suggesting that a natural breakpoint had been reached.

After the initial thematic analysis was completed, the study team re-examined the data using

Table 1. Interviewee Characteristics

Characteristic	Number of Respondents (%)	Prevalence among all small farm operators in WA ^a
Gender identity (self-reported)		
Female	9 (60.0%)	45%
Male	5 (33.3%)	55%
Transgender	1 (6.7%)	n.d.
Racial/Ethnic background (self-reported)		
White	14 (93.3%)	95%
Native American	1 (6.7%)	1%
First-generation farmer?		
Yes	13 (86.7%)	n.d.
No	2 (13.3%)	n.d.
Is farming your full-time occupation?		
Yes	8 (53.3%)	36%
No	4 (26.7%)	63%
For me but not my partner	3 (20.0%)	n.d.
How long have you been farming at this operation?		
<5 years	5 (33.3%)	14%
5–9 years	5 (33.3%)	15%
≥10 years	5 (33.3%)	69%
Age (years)		
25–34 years	2 (13.3%)	5%
35–44 years	5 (33.3%)	11%
45–54 years	2 (13.3%)	17%
55–64 years	4 (26.7%)	29%
65–74 years	1 (6.7%)	25%
>75 years	1 (6.7%)	11%

^a USDA National Agricultural Statistics Service, 2017a: Producers reporting farm sales of less than US\$250,000.

resilience frameworks proposed for farm businesses (Darnhofer 2014) and farming systems (Meuwissen et al., 2019). These frameworks allow study findings to be situated within the broader context of farm and food system resilience.

Research Ethics and Positionality

The University of Washington Institutional Review Board Human Subjects Division determined this research qualified for exempt status. Interview participants provided verbal consent to participate in this study voluntarily and to be recorded. Participant identities were known only to a subset of the research team and were kept confidential throughout data analysis.

All members of the author team have some experience with food production. In their professional capacities, they have prior experience interacting with food producers across multiple scales, systems, and geographies, including conventional, organic, and regenerative practices; crop and animal production; small, midsized, and large-scale operations; and local, regional, national, and international settings. The authors have no known personal connections to any of the study participants.

Results

Findings presented here highlight both similarities and distinctions in the impacts experienced by small farms during the first growing season of the pandemic, as well as farmers' explanations of driving forces behind why they experienced impacts or adapted in the ways they did.

Varied Impacts on Farm Businesses

This section describes areas where farmer experiences did not align around a common narrative but instead varied from farm to farm. Such heterogeneity of experience was evident when farmers discussed farm operations, business costs and prices, market channels, and revenue.

Production, inputs, and processing

While many farmers noted that production did not shift due to the pandemic, others explained that production was highly tailored to their market channels, and as market channels shifted, so did their production. For example, as one farmer tran-

sitioned from selling at the farmers market to CSA, they shifted to growing bell peppers and other "unique one-off things that you would find in a CSA that don't do well at market."

Interviewees reported experiencing both upstream and downstream supply chain disruptions, though none that caused significant changes to production. Two farmers explained it was difficult to obtain seeds in the first few months of the pandemic. However, one farmer was able to move forward by choosing different varieties of seed than usual, and the other was able to rely on saved seeds. The pandemic presented unique stressors for farmers selling meat products as they dealt with the fallout from bottlenecks in the meat processing industry. Farmers described challenges arranging on-farm custom slaughter, concerns around "if slaughter was going to shut down," and how they "were very limited on [the availability of] USDA processing." Despite these concerns, no interviewees reported major impacts on their meat production due to processing disruptions.

Labor

Labor-related experiences differed across farms. Many interviewees had a relatively small labor force of only one to two people to begin with; these operations did not make changes to their labor force in the 2020 growing season. Some who had larger workforces encountered challenges as a result of COVID-19 health and safety restrictions. One farmer explained that because they did not offer their work share program in the 2020 season, production quantity and quality decreased. A different farmer who typically relies on volunteer labor was worried about the increased amount of work but explained how their "super good core team" completed everything on its own.

Business costs and prices

While some farmers experienced no change in business costs associated with the pandemic, this was not true for all. One farmer reported increased costs associated with the logistics and implementation of handwashing stations, a farmworker safety program that they considered more relevant for large-scale agricultural operations in eastern Washington.

Two farmers who produced meat reported increases in processing costs. As one described:

The costs doubled between early in the pandemic and June, and so that, for a business our size, is huge. I'm not sure why, but it jumped from [US]\$1.10 per pound for processing to [US]\$2.79 a pound for processing in that time frame. F10

Prices interviewees charged for their products generally did not change, although there was variability. For example, one farmer explained they had increased the sales price of their beef due to the doubled processing costs, while another shifted to selling garlic at their farm stand instead of wholesale and therefore charged a higher retail price.

Market channels

Interviewees experienced significant reorganization of their market channels due to the pandemic. Generally, as restaurants and farmers markets closed, interviewees shifted to selling via CSA or farm stand. Shifting toward CSA sales was a common occurrence, and farmers often described this as an “easy” shift:

It just felt like a really natural, easy way to do the numbers. Like how many more CSAs would I need to make up the market income that I projected? Oh, I think I can do that, or close enough. F12

As many farmers markets closed or reduced capacity during the pandemic, some farmers opted out of markets entirely or decreased the number of farmers markets they participated in. Several interviewees explained that the risk of COVID-19 made them hesitant to participate in markets at all. One farmer implemented a completely new sales strategy during the pandemic:

When [farmers'] markets shut down, we occasionally just went down and sold on the streets of Seattle. It was by no means a worthwhile market, but it maintained the idea that we are committed to growing. F14

Eventually, farmers markets did reopen. While some stayed away, this same farmer chose to focus heavily on selling at farmers markets. They

reflected on the success they were able to achieve as a result:

If you look at our books, COVID is the best thing that's happened to us. This year... we're definitely in the black. But we did that through doubling down on selling at farmers markets. Really taking farmers markets and what we grow for farmers markets seriously. F14

Some farmers explained that new market channels emerged because of the pandemic. These new market channels were often facilitated by personal relationships. For example, a flower farmer explained how they were able to shift their drop site to the home of a personal contact and were invited to participate in a home delivery service organized by a friend responding to the closure of farmers markets.

Revenue and stifled growth

Changes in revenue experienced by farmers were not uniform across the board; interviewees reported increased, decreased, and unchanged revenue. Some farmers expressed that from a financial perspective, COVID-19 was particularly good for their business. However, some who experienced increased revenue also provided insight into what they described as “stifled growth.” In other words, they expected rapid growth for their business in the 2020 season, and actual growth was less than anticipated:

We were expecting a 25% increase in gross sales this year, and that was a conservative estimate. And this year, our gross sales are just under 12% higher than they were last year. ... If you look at other farms that have been established for longer and aren't going through periods of rapid growth, they aren't doing as well. So we are the odd scenario here where COVID definitely had a negative impact on markets however that's not reflected in our accounting. F14

Common Experiences of Farmers

This section describes themes that emerged around common experiences with perceived and actual uncertainty, stress, and attitudes about small farms.

Uncertainty

Many farmers expressed a general sense of uncertainty during the pandemic. Some wondered if the increase in demand they were experiencing would be maintained in future seasons or if they were just creating “insecure marketing streams.” Others explained how it was difficult to adapt if they did not know what the world would look like in a month or even a year. Farmers described how this pervasive feeling of uncertainty made decision-making more difficult. A farmer who produced raw milk, among other animal products, experienced an unprecedented boom in demand and faced a decision of whether or not to expand their herd size. They expressed concern about getting “stuck” with extra milk because “you can’t just turn a cow on and off” in response to consumer demand.

Stress and strain

Stress was a common feeling expressed by farmers. Some were stressed because COVID-19 greatly reduced their cash flow, particularly at the beginning of the season. Stress was exacerbated as farmers who relied on off-farm income were unable to work their other jobs. For one, this meant “living tightly” and temporarily suspending their house payments. Others were worried about the possibility of getting sick or having someone on their crew get sick. These fears strained social dynamics among farm employees as they had to navigate social distancing while working a job that required close contact with others. Some also noted that the pandemic was not the only challenge faced in 2020, hinting at the 2020 presidential election as well as social unrest and general public polarization. One farmer shared how this backdrop, combined with COVID-19, made work particularly uncomfortable:

Most of the folks out here where I live don't seem to care, or have very strong political opinions [against] things like masks and social distancing. That makes it challenging to get supplies and not feel like people are being nasty and giving you the stink eye. F12

Positive attitudes toward local food

Farmers reflected positively on some aspects of the pandemic, like consumer attitudes and increased

demand. Several interviewees described a collective “wake-up call” for the public as a result of the pandemic and connected this to a positive shift in attitude towards small farms. A pork producer described how they had huge success during the pandemic in part because they were able to begin selling half a pig a week to a market they felt would previously have been unavailable to them. This farmer described how people seemed to “be on a different wavelength” because of COVID-19 and how their market contact was “using the COVID craziness...to get some new things approved by her boss.” This positive shift in attitude was accompanied by an increase in demand experienced across market channels. In particular, farmers described large waitlists for their CSAs and how people “wanted to give [them] money.” The largest uptick in demand was noted for meat and animal products, including milk and eggs.

Farmers also reflected on a renewed appreciation for the benefits and feasibility of local food systems. In general, farmers reflected on how they felt the pandemic affirmed the “viability of a local food system,” and one predicted “a pretty dramatic shift in people’s willingness to consider [CSA] as a model.” Further, both farmers and customers saw how strong local food systems had the ability to address chronic problems, like climate change, and acute problems, like the pandemic. One farmer noted that “small farms are regenerative and hold carbon.” Another described how “having a local food source is critical” as natural disasters become more intense as the climate changes. Customers and farmers also saw how small farms were able to adapt to meet the unique challenges that arose during the pandemic. For example, several farmers noted that customers chose to shop with them because they felt safer being around fewer people.

Drivers of Impacts and Adaptations

This section describes farmers’ explanations of driving forces behind why they experienced impacts or adapted in the ways they did. Themes emerged around product diversity, flexibility and autonomy, support, values, and access to resources.

Product diversity

The majority of interviewees described themselves

as diversified farm operations, which proved to be particularly beneficial during the pandemic. Farmers noted that supplying diverse products attracted customers who were interested in buying multiple items from one location. Interviewees also contrasted themselves with farms with less diverse offerings that did not have other products or market channels to lean on if challenges arose anywhere along the supply chain of a particular product. One farmer compared their diversified operation to a fictional cucumber farmer who might be struggling during the pandemic:

If I was just a cucumber farmer growing cucumbers for a pickle packer, and that pickle packer had to cut their orders in half because of staffing issues, I would be in a world of hurt. But because we're diversified, because we're direct to consumer, we can find a channel to sell pretty much anything. F14

Flexibility and autonomy

In general, interviewees used words like “nimble,” “adaptable,” and “adjustable” to describe their operations, noting that if they needed to make changes, it was “easy.” This operational flexibility manifested most clearly as the ability to shift between market channels and having autonomy over decisions. One farmer recognized that not all operations have this flexibility and contrasted themselves to a family that had been in the dairy business for 90 years who was forced out of business because they could not find an alternative market for their milk:

They sold all of their milk to a wholesaler ... and they could not retool. They were dumping 250,000 gallons of milk per day because of their contract and because they were not allowed to sell directly to the consumer. ... They tried to keep as many [employees] as they could. They sold everything but their home, they liquidated their retirement, just to keep their employees going. And finally, they said the only thing we have left is our home. And just like that, they sold their cattle to the meat packer, and they were out of business. F8

In contrast, a dairy farmer interviewed for this study *was* able to make adaptive changes during the pandemic enabled by the independent, diversified

nature of their business. At one point, they found themselves with extra milk; however, instead of dumping the excess and incurring a loss, they chose to make and sell cream. This was in part possible because they had the autonomy to pivot to new production methods and were not beholden to rigid contracts.

Multiple forms of support

Across the board, interviewees expressed feeling supported by their community. This took many forms, including increased verbal support, supportive grocery product managers, and direct financial support from customers. One farmer described that they “always kind of feel and know” abstractly that the support is there, but as a result of COVID-19, they experienced “tangible evidence” of that support as customers reached out to them offering to buy products, contact county officials, or generally trying to be helpful.

For some farmers, community support manifested as access to new market channels. Some gained new market channels in more mainstream outlets like grocery stores, while others had opportunities to participate in novel partnerships with new mobile farmers markets, nonprofit organizations, or other local businesses working to support those in need.

Interviewees also described how farming communities supported each other by connecting people to resources, services, and even occasionally direct financial support. As detailed previously, farmers selling meat products encountered challenges due to bottlenecks in the meat processing industry. One farmer explained how their network helped them navigate challenges accessing slaughter and avoid major disruptions to production. A different farmer noted the only reason arranging slaughter was not a stressor this year was because they were a member of a co-op that supported their processing needs.

Farmers reported receiving both direct and indirect forms of government support. Indirect support included selling to institutions like food banks that had received government funds to purchase from small farms or receiving a larger amount of “local currency,” a resource akin to a market bucks matching program. Only a small

number of interviewees reported receiving direct government aid in forms such as the Paycheck Protection Program (PPP) or the Economic Injury Disaster Loan. Barriers to accessing direct aid included being “too small” to apply, having to have an absolutely clean criminal record, and difficulty with the applications themselves. One shared their frustrating experience of spending time filling out the PPP application, only to be disqualified because they did not have payroll expenses in February 2020.

Business values

Farmers described how farm mission and values influenced their operations, market channels, and price decisions. They described their desire to “be an asset to the community,” emphasizing the notion that they were not farming just to “get bigger,” but to provide quality food aligned with the values of their business. All the interviewees wanted to run a successful business at baseline yet seemed to broaden their definition of success beyond profit maximization. In fact, many farmers were explicit that money was not the only or even the most strongly held value of their business.

Nearly all farmers interviewed for this study emphasized the importance of values to their business, and environmental stewardship, producing nutrient-dense food, and feeding the community emerged as frequently shared core values (Table 2).

Thirteen of 15 (87%) farmers explicitly called attention to at least one of these core values either in their farm’s mission and values statement or elsewhere in the interview.

During the pandemic, farmers leaned heavily into their mission of feeding others, and several farmers explicitly stated the general importance of improving food access in their communities. Specific to the pandemic, many farmers reflected positively on how they felt they could fill gaps in food access when, for example, there were shortages at grocery stores and food banks, or people did not feel safe leaving their homes. One farmer shared a story of how the small Hispanic population in their community leaned on their farm stand for produce when they did not feel safe going to the store:

We found out they were feeling very fragile when things first started because some of them aren’t citizens and they didn’t know if they would have health care if they got sick, so they didn’t want to shop [at the store] at all. So they connected with our farm stand. There was one person who was basically buying for everyone and bringing it to a central location. F15

It also became particularly evident that values were tightly linked to decisions about setting prices. One farmer described seeing the needs of their friends—the people they wanted to feed—and reducing their prices accordingly.

Table 2. Core Values and Illustrative Examples as Expressed by Interviewees

Commonly shared core values	Number of farmers expressing this value (N=15)	Illustrative quotes from interviews
Environmental stewardship	11	<i>We aim to be good stewards of the land producing naturally grown products using sustainable, low impact farming methods. F8</i>
Feeding the community	11	<i>It’s a value of the farm to feed the folks that are nearest to us and keep those food systems supplied. F12</i>
Producing nutrient dense food	6	<i>[We have a desire] to be a provider of healthy food. F2</i>
Multiple core values expressed simultaneously		
2 core values	7	<i>[Our mission is] working with the land and the environment to create food access for our community. F7</i>
3 core values	4	<i>Our goal is to grow nutrient dense foods, whether that’s vegetables or proteins, as sustainably as possible, with community in mind. F12</i>

Interviewees reflected on perceived values held by their customers as well. This was most evident for meat producers who described the “reminders” customers received about industrial meat production. One pig farmer mentioned how the COVID-19 outbreaks experienced in slaughterhouses drew negative attention in the press and subsequently drove a spike in demand:

Any time something happens in the news with the big slaughterhouses, people get reminded that there are these big factories that process 10,000 pigs a day. And then they come and buy more from a small farmer. F1

Access to additional resources

Throughout the interviews, farmers identified resources that contributed to their ability to adapt and respond to the pandemic. Unsurprisingly, access to financial capital was beneficial. Social capital was also important to farmers as it facilitated access to new market channels, inputs, and services, including childcare.

Interviewees expressed gratitude for their access to water and fertile, productive, well-located land, which were vital assets. Others noted that existing infrastructure, including buildings used as farm stands or farm stores, greenhouses, and space for parking, was crucial for success. Interviewees also described resources they felt were currently lacking and would be most beneficial for future resilience. Top-named needs included improved access to collaborative aggregation and distribution solutions like food hubs, improved access to administrative resources and software, and enhanced public awareness of the relationship between food access and farm viability (see Appendix B for a complete list).

Discussion

This study explores the experiences of western Washington State directly marketing small farms during the COVID-19 pandemic, with a focus on the implications for farm resilience. The findings show that participants demonstrated resilience and illuminate the strategies that *promoted* resilience. Additionally, the findings serve to contextualize experiences where simplistic interpretations belie hidden costs and potential inequities.

Tempering Interpretations of Impacts

The results presented here suggest that caution is warranted in interpreting reports of increased demand and revenue experienced by farmers during the pandemic. For example, a survey examining impacts of COVID-19 on Washington State farm businesses reported that 43% of respondents saw revenue increases in 2020 compared to 2019 (Collier et al., 2021). However, farmers in the present study were able to contextualize that simply experiencing an increase in revenue was not necessarily an unconditional success. Stifled growth and loss of off-farm income were financial challenges for farmers that were hidden behind the “success” of increased revenue and demand. Similar results were reported in a survey of beginning specialty-crop farmers in Missouri, where there was consensus among participants that business expansion had been delayed as a result of COVID-19 (Patillo et al., 2021). It is also notable that two-thirds of farmers interviewed for the present study were considered beginning farmers, a group that may be especially vulnerable to financial disruptions (Key & Lyons, 2019).

Interviewees in the present study made enormous efforts to continue operations in 2020, and many were able to maintain production despite a smaller workforce. While on the surface these are heartening stories of success, it is possible that implementation of short-term workarounds contributed to the physical, emotional, and mental stress (i.e., burnout) experienced by farmers. As one interviewee relayed, farmers were “super, super stressed out” during the pandemic. This sentiment is consistent with reports that the pandemic took a toll on the mental health of U.S. farmers (American Farm Bureau Federation, 2020; Krebs, 2020; Pappas, 2020; Wypler & Hoffmeyer, 2020). Now, both timely assistance and further research are needed to address and understand the mental health impacts of the pandemic on farmers.

Another notable trend was the greater consumer interest and participation in the local and sustainable food movement that occurred during the first growing season of the pandemic (O’Brien, 2020; Patillo et al., 2021; Robinson et al., 2021; Schmidt et al., 2020). This boom was frequently noted by interviewees as a positive change, and

indeed the broader environmental and societal benefits of local and regional food systems have been widely discussed (Low et al., 2015). Both farmers in the present study and beginner specialty crop farmers in Missouri spoke broadly of the increased appreciation and importance of local food (Patillo et al., 2021). However, given that one of the benefits of operating a small, directly marketing farm is the ability to set premium prices (Walkinshaw et al., 2019), the boom experienced by this sector during the pandemic also invites examination of who is and is not typically able to participate in this movement. Research geared toward understanding barriers to participation in local food systems oriented toward sustainability and equity is warranted to help ensure that local and regional food policies promote equitable access to the benefits conferred by local food movements.

Resilience in Action

Identifying farm characteristics that contribute to resilience is of great interest for the development of policies and programs that will enhance the overall resilience of food systems to future challenges, and many such characteristics have been proposed (Darnhofer, 2014; Gardner & Ramsden, 2019; Meuwissen et al., 2019; Milestead & Darnhofer, 2003). Here, we analyze study findings in the context of three farm resilience capabilities outlined by Darnhofer (2014): buffer, adaptive, and transformative. Darnhofer (2014) calls attention to the notion that the term “capability” implies an active process rather than an asset or characteristic. In order to examine the characteristics that allow farms to demonstrate these capabilities, Meuwissen et al. (2019) propose utilizing resilience attributes as laid out by the Resilience Alliance (2010), among them diversity, openness, tightness of feedback, and systems reserves. The results of the present study demonstrate how some small directly marketing farms acted on these capabilities, and that flexibility and autonomy were important resilience attributes. The results also suggest an interplay between farm size and resilience and farm business values and resilience. Table 3 defines and provides illustrative examples from this study for Darnhofer’s (2014) three resilience capabilities and selected resilience

attributes from Meuwissen et al. (2019) and other sources.

Buffer capability

In this study, many respondents expressed that some parts of their operations shifted only minimally, if at all, which demonstrates resilience via buffer capability. Areas that did not change or shifted only minimally for some farm businesses included production, labor, expenses, product sales prices, and market channels.

Tightness of feedback, openness, redundancy, and access to social and financial capital were the resilience attributes that allowed farms in this study to demonstrate buffer capability. For example, one farmer showed tightness of feedback and openness as they clearly identified the gap left in farmers markets and chose to shift *to* this outlet while many others shifted *away*.

Access to financial and social capital were also critical attributes. For example, off-farm income from a spouse provided a second income stream that was critical to the farm’s ability to survive the pandemic. Farmers were also able to rely on social capital, or their networks, families, and friends for support in the 2020 season. Here, social capital can be understood as a type of systems reserve that was used to access a range of resources from childcare to new market channels and other services.

Adaptive capability

Farmers in this study nimbly adjusted parts of their operations in order to continue farming during the pandemic, demonstrating resilience via adaptive capability. Areas for some that shifted while maintaining the same essential system functions included production, labor, business costs, sales prices, and market channels.

Flexibility, diversity, and autonomy were key resilience attributes that allowed farms in this study to demonstrate adaptive capability. For example, the small farmer who had unsold milk at one point during the pandemic was able to make the decision to diversify their production and make cream; in contrast, the large dairy facing the same problem lacked the flexibility and autonomy to diversify and was forced out of business. In general, farmers were able to make the decision to grow different

and diverse crops, problem-solve in ways they saw fit, and, importantly, shift market channels. Market-channel pivots during the pandemic were common among small farms across the U.S. (Dankbar et al., 2021; Lemos & Ackoff, 2020; Local Food Research Center, 2021; White, 2021),

and in international studies have been associated with positive outcomes (Benedek et al., 2021; Hsiao et al., 2021; Mastronardi et al., 2021).

Openness was interrelated with autonomy, as farmers were deeply connected to their own operations and communities; this contributed to their

Table 3. Resilience Capabilities and Attributes with Demonstrative Examples Reported by Interviewees

Resilience capabilities and attributes	Definition	Example
Buffer capability^a	The ability to absorb a shock without a change in structure or function, like persistence or robustness (Darnhofer, 2014; Meuwissen et al., 2019).	Increasing the number of CSA shares sold to compensate for the loss of other market channels.
Adaptive capability^a	The ability to adjust and change in response to shock, but without changing essential functions or systems (Darnhofer, 2014; Meuwissen et al., 2019).	Planting more varieties of lettuce and other specialty items to meet demands of shifting market channels.
Transformative capability^a	The ability to implement significant changes, essentially creating a new system in response to severe shocks or enduring stressors. This could include changing functions, such as a transition from crop production to agritourism (Darnhofer, 2014; Meuwissen et al., 2019).	Creating novel market channels that emerged in response to the pandemic.
Diversity^b	Functional diversity, i.e., multiple species of crops grown on a farm; response diversity, i.e., a range of different reactions that contribute to the same outcome or function (Carpenter et al., 2012; Kerner & Thomas, 2014; Meuwissen et al., 2019; Reidsma & Ewert, 2008).	Producing a wide range of products protected against supply chain disruptions, like labor shortages causing processing delays.
Tightness of feedback^b	The ability of one part of a system to change in response to other parts of the system (Meuwissen et al., 2019; Walker & Salt, 2006).	Packaging flowers differently to accommodate the needs of new marketing channels.
Systems reserves^b	The resource stocks of a system, including natural, economic, and social capital (Biggs et al., 2012; Kerner & Thomas, 2014; Meuwissen et al., 2019).	Compensating for shortfalls in volunteer labor with a well-organized core team.
Openness^b	Connectivity between systems (Carpenter et al., 2012; Meuwissen et al., 2019).	Shifting to farmers markets in response to a gap as other farmers left farmers markets.
Redundancy^b	The extent to which elements of a system are replaceable or complete the same function (Tendall et al., 2015).	Relying on off-farm income during the 2020 growing season.
Autonomy^b	The degree of control producers have over production and their ability to observe and respond to feedback (Rotz & Fraser 2015).	Making the decision to produce cream when faced with excess milk supply.
Flexibility^b	The ability to modify behaviors or plans, or adapt existing resources to new purposes (Harris & Spiegel 2019).	Shifting swiftly to selling via CSA as other market channels became unavailable.

^a resilience capability; ^b resilience attribute

ability to make the appropriate decisions and shifts in their operation. The connection with communities also suggests that systems reserves were an important attribute, as many farmers used their personal networks to facilitate new market channels. Interestingly, only one farmer shared an experience of participating in a new market channel that was created by a public organization, suggesting that among those interviewed, personal connections played a larger role in accessing new market channels than did government support.

The findings that flexibility, diversity, autonomy, and openness were key resilience attributes for farmers during COVID-19 align with findings from Coopmans et al. (2021), Perrin and Martin (2021), and Mastronardi et al. (2021), who call attention to the same attributes, as well as agility and self-organization. There remains limited research on if and how small farms in the U.S. demonstrated resilience. Future research could fill this gap and focus on how to support farmers to foster key resilience attributes.

Transformative capability

Farmers in this study made major adaptations to their business during the pandemic: they shifted production, opened entirely new market channels, and managed with less labor. However, the idea of transformative changes was not often discussed at the level of individual farms but instead in the context of the collective power of small farms to shape future food systems. Transformations are likely to occur over a long period of time and can be triggered by a crisis (Darnhofer, 2014); therefore, it is possible that the COVID-19 pandemic will serve as a trigger for larger food systems transformation, as opposed to transformation experienced at the level of farm businesses. For example, one way the food system could shift is to more actively adapt and respond to environmental concerns. Time and again, interviewees spoke about their role as a farmer in addressing climate change. They articulated that because many small farms focus on regenerative and environmentally sound practices, they will be important players in combating and responding positively to a changing climate. In essence, interviewees are trying to lead by example and serve as a model for other farms to adopt these practices—

thereby serving to create transformative change in the food system.

Values and Resilience

Results of this study suggest that values, particularly those focused on “community,” are a driver of resilience at the level of farm businesses. For example, one farmer described their desire to be an asset to the community, which indicates an openness between this farm and its customers, local organizations, and other farmers. Results also suggest that values related to community could augment systems reserves, particularly social capital. This was highlighted in many ways but can be distilled down to how farmers, the farming community, and customers showed up for each other during the pandemic; farmers were dedicated to providing food, and customers stepped up to help facilitate new market channels. Simply put, these values serve as motivators beyond profit for farms to adapt and persevere through challenging times.

Size and Resilience

Several farmers attributed their ability to adapt during the pandemic to the size of their business, describing how having few employees and a small scale of production allowed them to manage logistics like market channel pivots with relative ease. Farmers also mentioned that having small work crews made it easier to manage safety protocols like social distancing.

However, a smaller workforce also meant a relatively higher per-capita cost of implementing some sanitation measures, like handwashing stations. Some interviewees also explained that they were “too small” to receive government financial aid and thus bore a relatively larger amount of the financial burden of adapting. While the broad safety regulations (Berton, 2020) and financial aid given to farm businesses (Washington State Department of Agriculture, 2022) during the pandemic were clearly warranted, their disproportionate impacts highlight a need for enhanced capacity in state government to shape policies and regulations with small farms in mind and help small farms navigate policies geared toward larger operations.

The dual role that farm size played in shaping

impacts of the pandemic opens an interesting avenue of investigation. Findings that small size in some cases played a mitigating or positive role stand in stark contrast to reports of how small businesses as a whole fared during the pandemic. In general, small businesses faced mass layoffs and closures, in part due to their financial fragility (Bartik et al., 2020), although impacts varied by sector (Dua et al., 2020). In the present study, small size may have had a protective effect for multiple reasons. For one, operations were often so small that there were no employees to lay off. Additionally, the essentiality of the sector and the flexibility of direct-to-consumer sales may have helped increase the likelihood of finding alternate markets. Finally, small size may have facilitated flexibility and thus the ability to shift market channels to those with less direct public contact (e.g., CSA or farm stand). In a case study of a small-scale dairy in North Carolina, Huber (2020) argues that small-scale producers are a necessary component of resilient food systems due to their agility and community connections.

Transferability and Significance of Results

To date, few qualitative studies have been published that center the experiences of small direct-marketing farms in the U.S. during the first wave of the COVID-19 pandemic (e.g., White, 2021). The present study, therefore, contributes foundational insights into what is becoming an otherwise robust body of literature on impacts on U.S. farms and farmers during COVID-19. Furthermore, considering that these exact circumstances are unlikely to repeat themselves, the focus of this study is on transferability as opposed to generalizability. The myriad unique experiences of small farms in Washington State are certainly not all captured among the 15 farmers who participated in this study. Indeed, the sample population for this study is not intended to be broadly representative of all small, direct-marketing farms in the state. Participating as an interviewee required an investment of time and effort by farmers at a time that was already challenging and stressful for many. One survey reported that 66% of farmers and farmworkers felt the pandemic affected their mental health during this time period (American Farm Bureau Federa-

tion, 2020). While participants in the present study reported experiencing negative emotions due to the pandemic, it is possible that those facing more severe mental health impacts declined to participate. Given that many interviewees expressed how tightly their personal and business lives were linked, those who were willing to participate in an interview may have had different experiences from those who did not have the capacity or inclination to participate. While this is not a problem per se for the present study, which seeks to understand drivers of resilience and focuses primarily on factors contributing to *positive* experiences, it is notable that the results presented here may not be fully transferrable to farms that were more negatively impacted during the pandemic.

It is also important to note that while the sample population for this study mirrored the majority white racial/ethnic makeup of small farms in Washington State (Table 1), the choice not to deliberately oversample from non-white farmers meant that some races/ethnicities were not included in the study at all. Notably, no farmers identifying as Black or Hispanic are part of the study population. Considering that minority farmers have historically faced racist policies (Figueroa et al., 2020; Horst & Marion, 2019), and in light of racial inequities reported in the distribution of federal COVID-19 farming aid (Reiley, 2021), it is unlikely that experiences of the majority-white sample population are fully transferrable to farmers belonging to racial and ethnic minorities, who continue to experience disparities in support systems and among whom higher frequencies of negative experiences during the pandemic have been reported (Otten et al., 2021). One criticism of resilience theory is that it can be applied to maintaining an inequitable status quo (Darnhofer, 2014; Olsson et al., 2015). It is therefore important to identify where underlying inequities may influence the continued development of resilience theory and application.

While we posit that these findings will be useful to many policymakers and other stakeholders in identifying lessons learned during the pandemic and planning for future food system disruptions, we leave the final determination of transferability to the individual.

Conclusion

This study sought to examine the experiences of small farms in western Washington State engaged in direct marketing during the first growing season of the COVID-19 pandemic. Findings provide deeper context to already-documented impacts that occurred in farm operations, marketing channels, revenue, demand, and general attitudes toward small farms. It is important for policymakers to understand the nuances of these impacts in order to better serve the needs of small farms in Washington State and beyond in the wake of the pandemic and in light of future uncertainties. This study also sheds light on the resilience capabilities

and attributes employed by small farms in response to the pandemic. Future research should focus on ways to both promote resilience attributes and facilitate the ability of farmers to act on resilience capabilities. Deeper understanding here can inform policies and programs that support farmers' ability to manage with resilience in mind.

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Appendices

Appendix A. Focused Codes, Categories, and Themes

Focused Codes	Category	Related Themes
<ul style="list-style-type: none"> - “Big meat” alternative - Increased demand for animal products - Accessing slaughter - Regulations are a barrier - Reminders 	Animal production	<ul style="list-style-type: none"> - Farm operations - Demand - Values
<ul style="list-style-type: none"> - Cost of business stayed the same - Labor costs more - Spending more on sanitation 	Business costs	<ul style="list-style-type: none"> - Farm operations
<ul style="list-style-type: none"> - Cash flow was tight - Challenge accessing labor - Complex decisions - Labor costs more - Difficulty accessing resources - Stress - Tense political times 	Challenges during covid	<ul style="list-style-type: none"> - Farm operations - Shifted attitudes or feelings
<ul style="list-style-type: none"> - Increased demand from covid - Increased demand for animal products - Uncertainty in demand - Reminders 	Demand	<ul style="list-style-type: none"> - Diversity - Support - Market channels - Shifted attitudes or feelings
<ul style="list-style-type: none"> - Donations are down because there’s no “extra” - Participation in hunger relief programs 	Emergency food system	<ul style="list-style-type: none"> - Market channels - Demand - Values
<ul style="list-style-type: none"> - Pivot - Social dynamics with employees - On-farm volunteers - Quick decisions - Small size made us flexible - Farm values influence operations - Expected change but didn't change 	Farm operations	<ul style="list-style-type: none"> - Farm Operations - Diversity - Flexibility
<ul style="list-style-type: none"> - I teach others - Social opportunity 	Farm/public interface	<ul style="list-style-type: none"> - Farm operations - Market channels - Values
<ul style="list-style-type: none"> - Farming as a career option - Farming is my full time occupation - Farming is not my full time occupation - Farming is my full time occupation, but not my partner's 	Farming as a career	<ul style="list-style-type: none"> - Shifted attitudes or feeling - Values
<ul style="list-style-type: none"> - Dissatisfaction with aid - Lack of information - Regulations are a barrier - “Too small” 	Government	<ul style="list-style-type: none"> - Farm operations - Support - Access to resources
<i>continued</i>		

Focused Codes	Category	Related Themes
<ul style="list-style-type: none"> - Things take more labor - We managed with less labor - Labor costs more - Challenges accessing labor - On-farm volunteers - Small number of employees - Small size made us flexible 	Labor	<ul style="list-style-type: none"> - Farmer operations - Flexibility - Access to resources
<ul style="list-style-type: none"> - Benefits of diverse market channels - Connection to new market channels - COVID market channels work better for me - Restaurant sales changed - Market channels lost to COVID - Instability of market channels - CSA predicted stability - Relationships facilitate market channels - On farm infrastructure is helpful 	Market channels	<ul style="list-style-type: none"> - Market channels - Diversity - Values - Flexibility - Access to resources - Support
<ul style="list-style-type: none"> - Perfect for the pandemic - Relationships facilitate market channels - Received government support - Pivot - Quick decisions - On farm infrastructure is helpful - Direct community support to farms - Flexible contracts - Ability to make changes - Small size - "No challenges during COVID" - Benefits of diverse market channels 	Positives/positive facilitators during covid	<ul style="list-style-type: none"> - Diversity - Flexibility - Access to resources - Support
<ul style="list-style-type: none"> - Prices have decreased - Prices have increased - Prices haven't changed - Prices vary by market channel - Farm values influence price decisions 	Prices	<ul style="list-style-type: none"> - Farm operations - Values - Support
<ul style="list-style-type: none"> - Production has not changed - Production has increased due to COVID - Change in production due to COVID - Benefits of diverse production 	Production	<ul style="list-style-type: none"> - Farm operation - Market channels - Diversity - Flexibility
<ul style="list-style-type: none"> - Revenue down in COVID - Revenue up in COVID - Revenue the same in COVID - Revenue stifled due to COVID 	Revenue	<ul style="list-style-type: none"> - Demand - Values - Diversity - Flexibility
<ul style="list-style-type: none"> - Customers don't feel safe at the store - Personal health scares - Spending more on sanitation - Social distancing 	Safety	<ul style="list-style-type: none"> - Demand - Market channels - Values

continued

Focused Codes	Category	Related Themes
<ul style="list-style-type: none"> - Luck - Stress - Uncertainty - Hopeful - “We survived” 	Sentiments	<ul style="list-style-type: none"> - Farm operations - Access to resources - Support - Shifted attitudes or feelings
<ul style="list-style-type: none"> - Litmus test - Catalyst - People thinking about things differently - Fire drill - Increased customer appreciation - People don't feel safe at the store 	Shifted attitudes	<ul style="list-style-type: none"> - Demand - Shifted attitudes or feelings - Values - Support
<ul style="list-style-type: none"> - Fire drill - “Big meat” alternative - Increased demand for animal products - Farming as a career option - Fill the gap 	The role of small farms	<ul style="list-style-type: none"> - Demand - Shifted attitudes or feelings - Values
<ul style="list-style-type: none"> - Uncertainty in demand - Predicted stability of customer base - Predicted stability of market channels - Litmus test - Viability of local food systems - More changes next year 	Thinking to the future	<ul style="list-style-type: none"> - Shifted attitudes or feelings - Values
<ul style="list-style-type: none"> - Farm values influence market channels - Farm values influence operations - Farm values influence price decisions - Money is not my only value - Value feeding the community 	Values	<ul style="list-style-type: none"> - Shifted attitudes or feelings - Values
<ul style="list-style-type: none"> - Reminders - Fire drill - Litmus test - “Big meat” alternative - People thinking about things differently - Fill the gap 	Driving consumers to small farms	<ul style="list-style-type: none"> - Demand - Shifted attitudes or feelings - Values
<ul style="list-style-type: none"> - Accessing slaughter - Direct community support to farms - Mutual support - Networks - Received government support 	Access to resources	<ul style="list-style-type: none"> - Farm operations - Market channels - Diversity - Support
<ul style="list-style-type: none"> - Diverse skillset - Quick decisions - No one got sick - We managed with less labor - On-farm infrastructure is helpful - Ability to make changes 	Well-managed farm operations	<ul style="list-style-type: none"> - Farm operations - Values - Diversity - Flexibility - Access to resources

continued

Focused Codes	Category	Related Themes
<ul style="list-style-type: none"> - Ability to make changes - Flexible contracts - Money is not my only value - Quick decisions - Relationships facilitate market channels - Value feeding the community 	Autonomy in decision making	<ul style="list-style-type: none"> - Farm operations - Values - Diversity - Flexibility - Access to resources
<ul style="list-style-type: none"> - Accessing slaughter - Benefits of diverse market channels - Catalyst - Commitment from customers - Relationships facilitate market channels 	A resilient/flexible environment	<ul style="list-style-type: none"> - Market channels - Shifted attitudes or feelings - Demand

Appendix B. Desired Resources and Illustrative Examples Reported by Farmers

Desired resource	Example quotations from interviewees
Access to aggregation, food hubs, co-ops, etc.*	<i>Increase in the centralized distribution for small scale growers. There's the Puget Sound Food Hub, but they only serve a handful of farmers.</i>
Access to bookkeeping, accounting, administrative resources*	<i>There's not really effective software. . . . I've got a bookkeeping system, but it's not really designed to keep track of my veg sales and stuff.</i>
Pairing food access and farm viability*	<i>I have been thinking a lot about the link between customers really wanting to support local farmers and farmers having an excess of whatever . . . how do you put those two things together?</i>
Employment benefits	<i>Health insurance for farmers.</i>
Reduced barriers to creating value-added products	<i>I don't have access to a processing kitchen. That's one thing I've been really hungering for because there's huge potential and the profitability goes up dramatically with value added.</i>
Mental health services	<i>But the thing I hear again and again and again from other farmers . . . it's just people are super, super stressed out. And I know that there are some mental health resources in the state of Washington for farmers but I have not seen them in any of the resource lists that have been passed around to me.</i>
Reduced barriers to access financial capital	<i>I think more capital that is not a loan.</i>
Support for farm internships	<i>I'd like to see the [Washington State Department of Labor & Industries Farm Internship Program] more robust.</i>
Farm infrastructure	<i>The biggest challenge is large infrastructure items. For instance, we don't have a [local] haying operation. And it's really expensive to own that equipment.</i>
Community outreach	<i>The public isn't aware of a lot of the farm products or farms that are out there trying to move product. . . . There's always work that can be done with outreach.</i>
Change in meat industry regulations	<i>There needs to be a change in the way small farmers do meat. There are very limited options, it's very costly, and they can't begin to compete.</i>
Funds for farmers who identify as Black, Indigenous, or other People of Color (BIPOC)	<i>I would like to see more dollars made available to help BIPOC farmers buy land and start their business.</i>

* Denotes resources that were mentioned by at least 5 farmers

Challenges for the agritourism sector in the United States: Regional comparisons of access

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Abstract

Agritourism has become a popular pursuit for farms and ranches in the United States, aiming to diversify revenue sources and meet agricultural education and community-building goals. However, there has been limited research around the challenges experienced by operators and limited access to resources that can help address these challenges. This article fills that gap in knowledge by examining the challenges agritourism operations currently face in the Northeast, Midwest, South, and West regions of the U.S. In this study,

we use a mixed-methods approach to the Five Dimensions of Access framework developed by Penchansky and Thomas (1981). We operationalize their model in an ordinal probit regression to analyze data from a national survey of agritourism operators, analyzed by region. Results from the quantitative analysis are substantiated using qualitative, open-ended comments from the same survey. The analyses show that agritourism operators encounter different challenges according to their region. We find that operators in most regions of the United States are concerned about agritourism liability. However, states in the West region experience more challenges with regulations, zoning, and permitting, while operators in the South have more problems with e-connectivity. These results can be applied in three ways: support services for agritourism, policy and regulations, and future research.

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Keywords

Agritourism, Challenges, Ordinal Regression, Five Dimensions of Access, Liability, Regulation, E-connectivity, Food System, Rural Tourism, Rural Development

Introduction

Agritourism—welcoming visitors on farms and ranches for agricultural experiences and product sales—has grown into a popular operational model for small and medium farms throughout the United States and around the globe. Through agritourism, primary production operations are retained while new on-farm activities show promise of increasing revenue streams (Barbieri, 2013; D. M. Brown & Reeder, 2008; Chase et al., 2018; Rilla et al., 2011; Tew & Barbieri, 2012; Giaccio et al., 2018). Additionally, farms with agritourism enterprises may be motivated by nonmonetary goals such as community engagement and improved quality of life (Quella et al., 2021). Agritourism also provides benefits to consumers, such as access to open space, recreation, and education (D. M. Brown & Reeder, 2008). However, some studies have shown that agritourism may not be profitable for all operations, as originally asserted (D. M. Brown & Reeder, 2008; LaPan & Barbieri, 2014; Schilling et al., 2012; Van Sandt et al., 2018). These alternative farm enterprises can face issues related to regulations and liability (Centner, 2010; Colton & Bissix, 2005), suggesting there are greater challenges to agritourism that have not yet been explored.

A majority of research about agritourism has come from studies focused on individual states (e.g., Bernardo et al., n.d.; Gil Arroyo et al., 2013; Schilling et al., 2012; Tew & Barbieri, 2012) or on countries outside the United States (e.g., Colton & Bissix, 2005; Giaccio et al., 2018). Though a few studies have been conducted on a national-scale in the United States (e.g., Barbieri, 2013), their sample size is small. By presenting this research, we hope to add to the breadth of agritourism research in the United States with a national scope, like that of Liang and Dunn (2014), Van Sandt et al. (2018), and Quella et al. (2021), but that is divisible by region. Additionally, while a few examples exist (e.g., Bagi & Reeder, 2012; J. P. Brown et al., 2014;

Liang & Dunn, 2014; Rilla et al., 2011; Van Sandt et al., 2018; Wilson et al., 2006), more effort and more current inquiry is needed to better understand the challenges experienced by agritourism operators. Together with previous research and this more recent study, we might better be able to highlight opportunities for state-level agritourism support, or opportunities for inter- or intrastate network building and collaboration (Che et al., 2005; Clarke, 1995).

Studies on agritourism have explored the place-based growth of agritourism (Van Sandt et al., 2018; Wilson et al., 2006), the economic benefits of agritourism (J. P. Brown et al., 2014), and the motivations and behavior of agritourism operators (Bagi & Reeder, 2012; Gascoigne et al., 2008; Liang & Dunn, 2014; Quella et al., 2021). More recently, the COVID-19 global pandemic has introduced more challenges for operators as consumers demand more local foods (Kolodinsky et al., 2020) and leave cities, flocking to rural spaces (Wojcieszak-Zbierska et al., 2020). These changes put pressure on agritourism operators, who experience these demands from both consumers of food and consumers of agritourism experiences. This increased pressure further highlights the need to understand the challenges agritourism operators face.

Due to geographic and cultural similarities of the USDA-defined regions of the United States, exploring data between regions provides a unique insight into trends that undivided national and state-level data cannot provide. The regions, broadly, have specific agricultural and land-based traditions which attract tourists (Che et al., 2005; Weaver et al., 1996). Utilizing these regions to analyze a large national dataset allows us to understand how agritourism support systems might be developed and how parties interested in agritourism development (rural development organizations, state agriculture departments, rural extension professionals, et al.) might be able to coordinate and collaborate. As seen with place-based growth (Van Sandt et al., 2018), economic benefits (Das and Rainey, 2010), and motivations and behavior (Chiodo et al., 2019), similar challenges may be experienced by operators within a specific region due to similarities in cultivation practices, demand,

available resources, culture, or even political viewpoints. Examining the challenges of agritourism operators between regions can help provide a better resource for implementing agritourism support in the United States.

Limited Access to Resources

Given that the challenges experienced by operators are centered on resources available to the farmer, analyzing these challenges can be framed by the concept of *access to resources*. In this study, resources include predominately information (about laws and regulations, and risks and liability, among others) and services (provided by extension professionals and government bodies, among others). Limiting access to these key sources of information and services can limit access to practical education, an operator's ability to scale, plan for the future, and attract and maintain consumers (Bagi & Reeder, 2012; Centner, 2010; Hardesty and Leff, 2020; Rilla et al. 2011).

E-connectivity

In 2012, access to e-connectivity services was found to be a significant factor in the motivations of farmers to participate in agritourism (Bagi & Reeder, 2012). Internet access increases a farmer's information resources, as well as expansion of their market both online and on-farm, as promotional materials can reach a wider audience. While Bagi and Reeder's (2012) study took place over a decade ago, together with the present study, it shows that access to this resource (e-connectivity) has been and still is an integral part of a successful agritourism enterprise. The rise of internet use by consumers has prompted Extension professionals across the country to develop resources for agritourism entrepreneurs to learn how to use online marketing strategies to their advantage (Colucci et al., 2011; Ferreira, et al., 2020; Rilla et al., 2011; Sullins et al., 2010).

As in many other sectors and industries, e-connectivity can greatly impact the viability of agritourism businesses. Consumers rely on online marketing to learn about agritourism activities (Sullins et al., 2010), which are a significant factor in operators' decisions to participate in agritourism activities (Bagi & Reeder, 2012). However, all these

assume that e-connectivity resources, such as broadband, are available and accessible to operators in rural areas.

Regulations and Liability

In a study of agritourism operators in California, Rilla et al. (2011) found that some operators who experience difficulties with permitting had inadequate information from the permit-granting organization. Other studies have found that new liability statutes offer little support for agritourism operators (Centner, 2010), which can lead to an inability to scale up and difficulty earning profits. Similarly, complex and difficult-to-understand regulations act as a barrier to operators' access to information (Sznajder et al., 2009). In California, on top of extant permitting requirements, agritourism operators must obtain official certifications before opening to the public (Keith et al., 2003).

In this paper, we examine challenges experienced by agritourism operators (including those that offer direct sales) in the United States to better understand regional differences and issues around access. In the following sections, we will discuss the theoretical framework employed and methods used, present the data results, and discuss our findings.

Theoretical Framework

Access has been defined most succinctly as an individual or a group's ability to benefit from services provided by another individual or group (Ribot & Peluso, 2003). This definition, however, is limiting as access can relate to more than simply a *benefit* or a *service*. The most comprehensive definition of access comes from the field of medical care, specifically from the work conducted by Penchansky and Thomas (1981), who posited five interrelated dimensions of access. These five dimensions are availability, accessibility, affordability, accommodation, and acceptability (Figure 1).

Availability of a resource refers to the existing supply of resources compared to the demand by users. While *accessibility* is focused on the physical location of a resource, it also considers the time, cost, and physical accessibility (e.g., is there transportation?). *Affordability* focuses on the cost of the resource and the ability of users to afford those

prices for the resource.

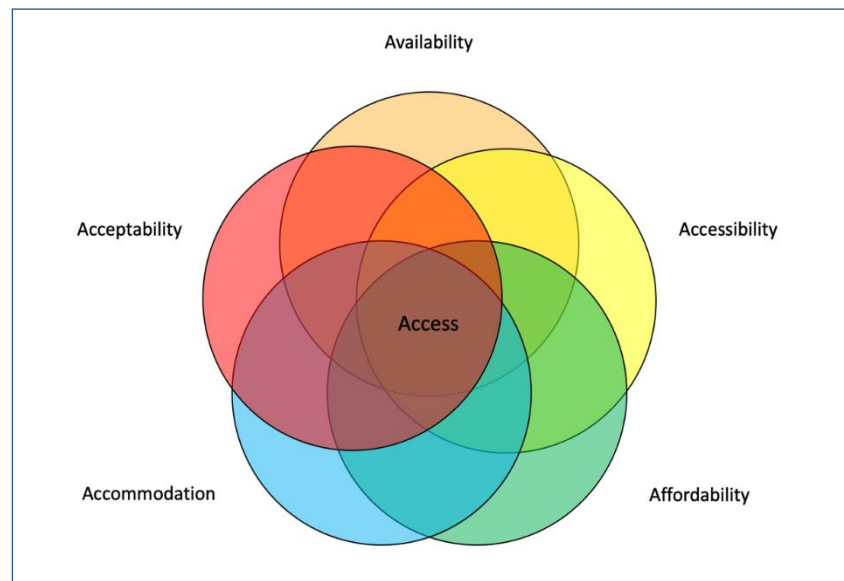
Accommodation looks at how a resource is developed with the user in mind and whether the user of the resource feels like the resource accommodates the limitations of their circumstances (e.g., hours of operation, physical access options). Finally, *acceptability* looks at the user's opinion of their experience using the resource. While the first three dimensions (availability, accessibility, and affordability) are more typical in assessing accessibility, these two final dimensions (accommodation and acceptability) consider the culture of a community and its associated needs.

Penchansky and Thomas' (1981) dimensions of access framework have been applied to food systems research (Caspi et al., 2012; Charreire et al., 2010). These studies offered a geospatial perspective on issues of access. More recently, scholarship on food systems has utilized the five dimensions of access to explore how the dimensions interact with low-income consumers of direct-to-consumer agricultural marketing (Wetherill & Gray, 2015; White et al., 2018). The framework has not yet been used within agritourism contexts. However, it is a useful frame for our continued development of a healthy agritourism ecosystem. By exploring the challenges indicated by respondents, the present study can compare access in the four regions in the United States. By further exploring issues of access to resources, we can continue to uncover the burdens agritourism operators face. The following sections are an attempt to understand these burdens, as indicated in our survey, and to what extent various challenges can be addressed by shifting access to resources for agritourism operators.

Research Methods

Data for this study were collected as part of an online survey developed under the USDA Critical Agriculture Research and Extension grant project

Figure 1. Adapted from Penchansky and Thomas' (1981) Dimensions of Access Framework



Critical Success Factors for Small and Medium-Sized Farms with Direct Sales and Agritourism, led by the University of Vermont in collaboration with the University of California Cooperative Extension, Oregon State University Extension, and West Virginia University. Qualitative data collected before the survey were used to guide instrument development (Quella et al., 2021). The project team designed and implemented an online survey using Limesurvey (Limesurvey GmbH, n.d.) to understand agritourism operations in the United States.

The survey was conducted between November 2019 and February 2020. Thus, all responses were completed prior to the onset of the COVID-19 pandemic. The research team used a snowball sampling method using known local, state, regional, and national networks. Agricultural service providers and operators were asked to forward the survey link to colleagues and other known operators. Additionally, press releases in local papers and notifications helped to capture additional respondents. This method is useful when surveying farming populations since this group is often hard to reach and has strong, internal group networking (Faugier & Sargeant, 1997; Morais et al., 2013). The snowball method also reduces the time and cost of locating hidden populations. However useful, this method resulted in a sample not representative of

the U.S. farming population, which limits the generalizability of the results.

The research team defined agritourism as any on-farm activity that attracts visitors (consumers) to the farm (Chase et al., 2018) for experiences or product sales. Examples include but are not limited to corn mazes, hiking, educational tours, and events. The team also included direct-to-consumer on-farm sales, as this is another method of attracting consumers to the farm. Respondents indicated the products and activities offered on their farm; quantitative visitor information; motivations and goals, challenges, supports needed, plans for the future, and helpfulness of available resources. Firmographic data, such as location, distance from cities, gross revenue and net income, and demographic data, including gender, education, and age, were also collected.

Variables

Dependent variables were selected from a list of twelve variables developed for the national agritourism survey and informed by qualitative interviews (see Quella, 2021). Respondents ranked each challenge as “not at all challenging” (0), “somewhat challenging” (1), or “very challenging” (2). For this analysis, we focused on four categories of challenges: *city and county zoning and permitting, concerns about agritourism liability, e-connectivity, and state and local regulations*. These variables provide insight into the challenges operators experience in accessing resources that might contribute to the success (or failure) of an agritourism enterprise (Centner, 2010; Rilla et al., 2011). Additionally, these variables constitute access to resources (such as capital, consumer markets, education, and information) that can greatly impact agritourism operators. Independent variables include the USDA-defined regions of the United States, self-identified gender, and years of experience with agritourism operations. The *regions* variable allows the data to account for regional similarities, e.g., culture and traditions, agricultural practices, and policies. We used USDA Agricultural Research Service (ARS) classifications to identify four regions in the US: Northeast, Midwest, South, and West (USDA ARS, n.d.). The survey offered binary gender choices (male=0, female=1) which, along with (continuous) years in agritourism, acted

as a control variable in the regression. Gender (Ball, 2014; Pilgeram & Amos, 2015; Schmidt et al., 2021) and experience (Sutherland & Burton, 2011) are factors that can impact the outcomes of challenges, hence their use as a control. Female-identifying operators are more likely to have smaller operations and concerns about sustainability and the environment (Ball, 2014). However, female operators may face greater challenges, such as a lack of cultural capital, and knowledge of resources and services available to them (Ball, 2014; Daigle & Heiss, 2020; Schmidt et al., 2021). Similarly, the number of years working in agritourism undoubtedly has its benefits; an operator with generational knowledge of an area and a wealth of cultural capital may fare better than a new operator in the same geographic area (Inwood, 2013; Scott & Richardson, 2021; Sutherland & Burton, 2011). This is particularly true for small farms (as defined by the USDA (2021)), which describe many agritourism farms, that rely on resource gathering from community ties (Van Sandt & Thilmany McFadden, 2016). We could not find any evidence that this generational knowledge varies regionally; however, the data set we employed might offer the chance for future studies to explore this.

In addition to the quantitative data mentioned above, the survey asked respondents to comment on the listed or other challenges to agritourism, including direct sales. This qualitative data complement the findings from the quantitative responses, helping identify the barriers to access for each challenge that might hinder operations’ success (Vaughn & Turner, 2016). Operators were provided space to respond in an open-ended response format.

Analysis

All analyses were completed using IBM SPSS Statistics (Version 27). We conducted descriptive analysis for the basic demographic variables and ordinal regression using the selected dependent and independent variables. For the ordinal regression, we transformed the region variable into three dummy variables (Midwest, South, and West), where Northeast was omitted to create a baseline for analysis (Suits, 1957). Gender (male=0, female=1) and (continuous) years in agritourism acted as control variables. The following are the results

from the descriptive analysis and ordinal regression.

Qualitative response data were open-coded by researchers on the team. Quotes were first grouped by region (Northeast, Midwest, South, and West), and then coded by alignment with the four challenges selected for quantitative analysis (*city and county zoning and permitting*, *concerns about agritourism liability*, *e-connectivity*, and *state and local regulations*). Each of these excerpts was then analyzed for its relationship to each of Penchansky and Thomas' (1981) dimensions of access (availability, accessibility, affordability, accommodation, and acceptability) and coded into the appropriate dimension(s). The following are the results from the descriptive analysis, ordinal regression, and coding of open-ended responses.

Results and Discussion

Analysis Results

There were 1,834 full or partial responses to the survey, with at least one respondent from each state. The average age of respondents was 55 years old. Most of the respondents (57.5%) identified as

female, with a college degree or higher (70.5%), and operated less than 100 acres of land (61.2%) that were located 30 miles or more from a city of at least 50,000 people (51.6%). Most responses came from the South (29.2%) and West (25.8%), with the fewest responses coming from the Northeast (24.2%) and the Midwest (20.9%). The sampling method allows us to make internal statistical generalizations, but care should be taken to make broader generalizations of the findings (Collins, 2010).

We created four ordinal probit regression models based on the selected challenge-dependent variables (*city and county zoning and permitting*, *concern about agritourism liability*, *e-connectivity*, and *state and local regulation*) using the following equation:

$$\text{Challenge}_i = \text{Threshold1} + \text{Threshold2} + \beta_1 \text{West} + \beta_2 \text{Midwest} + \beta_3 \text{South} + \beta_4 \text{Gender} + \beta_5 \text{Years in Agritourism} + \varepsilon_i$$

Region, *gender*, and *years in agritourism* were included as independent variables, with gender and years in agritourism included as control variables, as noted in the Variables section above. Table 1 presents the

Table 1. Ordinal Regression Output of Challenges by Region Where Northeast Is Omitted

	City and county zoning and permitting	Concern about agritourism liability	E-Connectivity	State and local regulation
<i>n</i>	1,254	1,334	1,330	1,281
Predicated response category	1 (Somewhat challenging)	1 (Somewhat challenging)	0 (Not at all challenging)	1 (Somewhat challenging)
Predicated Probability	0.51	0.55	0.42	0.44
Actual Probability	0.39	0.41	0.36	0.36
Threshold likelihoods				
<i>Not at all challenging</i>	1.084	0.564***	0.963	0.608***
<i>Somewhat challenging</i>	2.579***	2.609***	2.691***	2.028***
Regions				
West (\square_1)	2.067***	1.603***	1.054	1.511***
Midwest (\square_2)	1.142	1.292**	1.191	1.020
South (\square_3)	0.851	1.329***	1.594***	0.835*
Gender (\square_4)	1.089	1.067	1.073	1.020
Years in Agritourism (\square_5)	0.998	1.003	1.001	1.002

Note. * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

outcome of the ordinal regression. Included are the predicted response category and both the predicted and actual probabilities of each response category, respectively. Threshold and independent variable odds ratios (Exp(B)) are included with significance level.

For *city and county zoning and permitting, concerns about agritourism liability*, and *state and local regulation*, the predicted response category was “1” (Somewhat Challenging). This indicates that, for most operators, these issues were somewhat challenging for their operations. *E-connectivity* was the least challenging of the four variables as most operators selected “0” (Not at all challenging), meaning this was a less challenging issue for most operators.

The results indicate that each region’s experience with each challenge carries varying levels of significance. Responses from the West show that farmers in this region experience difficulty with all challenges except for *e-connectivity*. For the South, all but *city and county zoning and permitting* were significant. Responses from the Midwest were more likely to have *concerns about agritourism liability* than any of the other challenges we highlighted.

Discussion

Our findings on the regional differences in challenges to operations were supported by open-ended responses from operators. As one West Coast operator wrote, “This has been one of the hardest jobs and ventures I have ever been involved in, and I make little to nothing to show for all the effort and work put into this business.” Low levels of access to key resources like appropriate zoning/permitting and liability legislation, reliable and affordable *e-connectivity*, and suitable regulations can significantly impact farm operations and their viability.

City and County Zoning and Permitting

The analysis shows that operators are 2.6 times more likely to experience some challenges associated than many challenges related to zoning and permitting. Operators were also likely not to have any challenges with zoning and permitting as they are to have many challenges. Regionally, the West was 2.1 times more likely to have challenges with zoning and permitting than Northeast. There was

no significant difference between the Midwest and the South compared to the Northeast. Neither gender surveyed nor years in agritourism were significant in the model employed.

The operators’ comments corroborated and expanded on the quantitative results. Operators in the West are frustrated with “city-based bureaucrats who govern sweeping restrictions on ag-zoned operations,” including restrictions on “on-farm dwellings for farm helpers and visitors” that can have a strong impact on the financial health of an operation. Operators in the West were particularly concerned about the land-use laws as they “block innovation” from within the agritourism community. “Getting visitors from 50 miles away requires more lodging in our area, but agricultural zoning precludes this. [The regulators] need to give farmers/ranchers flexibility to provide on-site overnight accommodations if land-use doesn’t allow other entrepreneurs to develop in rural zones.” Without the ability to host guests from further distances, operators may not be able to obtain the financial stability that leads to success.

Similarly, respondents from the Northeast felt the pressure of local “building codes and requirements” as well as “conservation land restrictions” that hinder their operation’s ability to provide more facilities for staff and visitors. In the Midwest, county regulations were “a huge obstacle” and the “process was exceedingly difficult” for operators. These challenges have led operators to feel “snubbed” by regulators and to feel “very limited” due to these restrictions.

However, other operators wanted stricter enforcement of zoning regulations. In some areas of the West, large operations with event venues without agricultural output have hindered the production capacity of other farms due to a higher volume of traffic to more rural areas. For these farmers, “farm operations and spraying [has] become more difficult” due to proximity near the fields. Northeast operators agree that “regulatory changes ... don’t recognize rural or zoning constraints.”

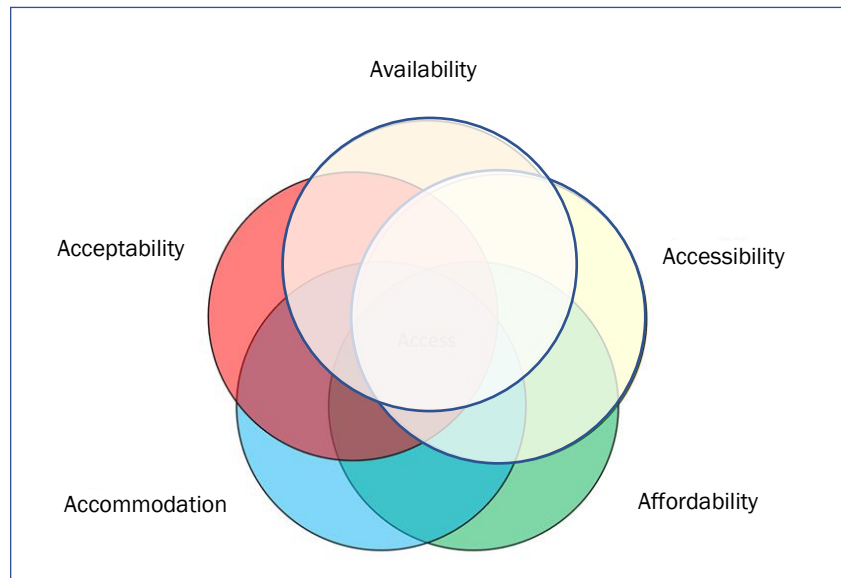
A common difficulty among respondents has been the lack of transparency regarding what types of permits they need to comply with regulations,

indicating a lack of availability of and accessibility to the information needed for success. Where greater direct assistance from government entities, such as easy-to-find information on web-based resources, use of clear language in written materials, or informed local government staff may have eased access issues. Operators in the West region felt that local government officials were giving them “the run-around, no one seems to know the answers, and each gives a different interpretation of nonsensical, bureaucratic rules.” This lack of transparency has also made agritourism an untenable model for some because there is an “unknown ‘how’ or ‘what’ to plan [for] let alone investing more capital into agritourism” even though operators “need to invest to make [a] plan better.” These struggles with zoning and permitting (Figure 2) indicate a lack of accommodation afforded to agritourism operators when local policies are set, leading to difficult business environments, particularly in the West region.

Additionally, the lack of accommodation leads to affordability problems because operators must obtain permits to comply with the local regulations. However, local regulatory bodies are perceived to be under-educated about agritourism, causing a barrier to information for operators that can lead to frustration, non-compliance, and loss of operators’ time for business development. This is possibly due to a one-size-fits-all approach many take to regulations. Different types of agritourism businesses (e.g., orchards, corn mazes, event barns) might require different regulatory frameworks. Exploring the challenges and access broken down by business type would be a beneficial area of future study.

Increasing the level of access, both in terms of availability and physical accessibility, to information and informed government officials can reduce the amount of work for operators as well as the

Figure 2. Limits to Access Due to “City and County Zoning and Permitting”



cost of unnecessary permits. By creating access to the clear and digestible city and county zoning and permitting laws, agritourism enterprises can better plan their available resources, whether financial capital, employee-related, operational, or otherwise.

Concerns about Agritourism Liability Issues

The second ordered probit model focused on concerns about agritourism liability issues, which impacts the way a farm operates in terms of the activities it can offer onsite. We found that, in all, operations were 2.6 times more likely to experience some concerns about agritourism liability compared to many concerns. However, they were more likely to have many challenges with liability than none. The West (1.6 times more likely), Midwest (1.3 times more likely), and South (1.3 times more likely) were all more likely to experience challenges with liability compared to the Northeast.

In line with the regression findings, operators from all regions noted that liability was a concern, particularly due to visitor behavior patterns and lack of insurance availability. Inappropriate visitor behavior due to lack of knowledge about farm and land operations or general disregard for farm rules was a stressor for all operators, as many could not find insurance policies that covered their various activities. In the Midwest, operators found that

“Insurance is a challenge because most companies don’t have a real idea about the actual risk factors, or how to write [the policy].” Others agreed, saying that “... very few [insurers] have any experience with what we do, and are therefore reluctant to provide the necessary insurance to help us thrive safely.” Certain issues with liability and lack of insurance stem from the issues around how agritourism is defined or not defined at the federal, state, and local levels. As a result, insurance companies are less likely to cover agritourism activities, or there are significant barriers to getting coverage (due to cost and time).

According to our survey, problems with insurance can be broadly broken into the high cost and the lack of understanding on the part of the insurer. Many operators noted the high cost of coverage due to the various on-farm activities they offer. One operator noted that their yearly income was US\$5,000 while the insurance policy for their on-farm transportation cost US\$4,000 per year. In the West, operators also wrote of dropped insurance policies because of conflicting on-farm offerings, such as combining lodging and cut-your-own tree operations. Cases like this were experienced by many respondents across regions.

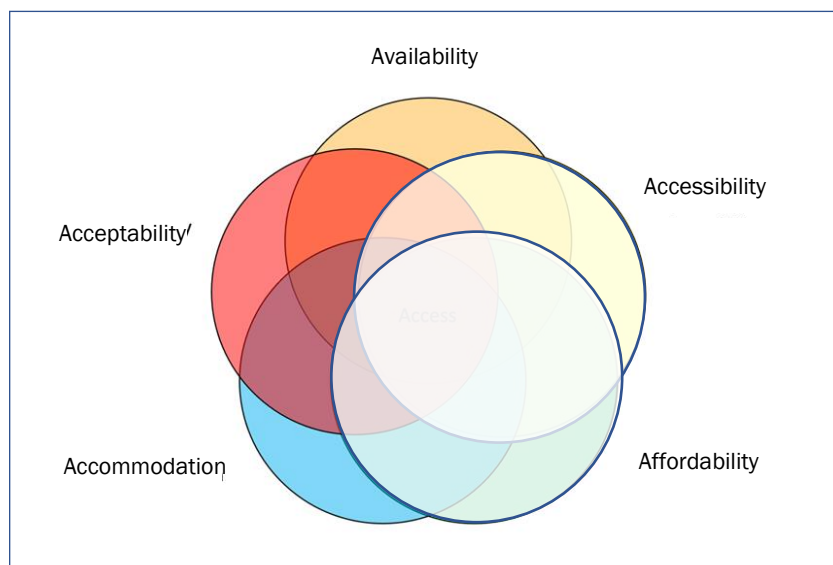
Challenges of liability result from the lack of accommodation of regulations for operators (Figure 3), which provides evidence found by

Centner’s (2010) analysis of agritourism liability statutes. This is coupled with the lack of awareness on the part of both visitors and insurers. Visitors are not always cognizant nor attentive of the guidelines of operators on their farms, leading to concerns about injury and other risks. Operators also have trouble finding insurers who can accommodate the needs of such multi-operational enterprises. Where there are available and willing insurers, the overwhelming cost is prohibitive for operators, particularly small-scale operations. State policies are also limited; some operators noted that states require enterprises to meet baseline requirements that are hard to achieve for small and mid-sized operations. Educating the voting public can help to alleviate some of these issues in the long term. However, broad state and federal support for agritourism operations around liability can also alleviate some of the burdens for operators.

While creating a unified definition of agritourism is a daunting task, a tangible step toward increasing accessibility is to educate the public, insurance carriers, and policymakers about agritourism on-farm liabilities. Through education, visitors may gain more respect for operators and have more fulfilling on-farm experiences. At the same time, insurers may redesign insurance models and policies that are more affordable and more accessible to agritourism and direct-sales operators.

In doing both, operators may experience more visitors and become more financially stable.

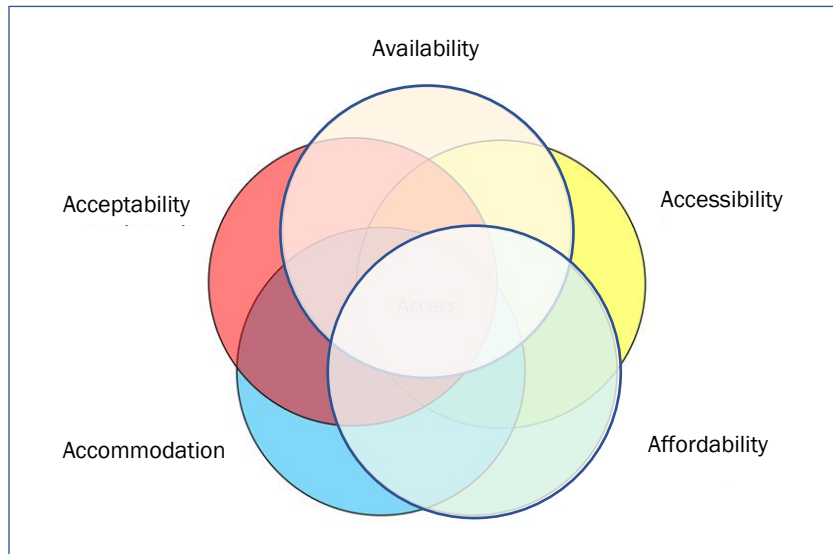
Figure 3. Limits to Access Due to Liability and Insurance



E-connectivity

Our results support the importance of e-connectivity to agritourism, as previously noted by Bagi and Reeder (2012). Reliable e-connectivity was less of an issue for agritourism operators compared to other challenges regression models, yet respondents were 2.7 times more likely to have at least some challenges compared as to none at all. We found that the South is 1.6 times more likely to have challenges with *e-connectivity* than

Figure 4. Limits to Access Due to E-Connectivity



the burden on operations in rural areas as it can cut into operational budgets. In the Midwest, operators find that the “internet has become so commercialized that it is almost unaffordable ... without spending considerable amounts of money.”

The lack of *e-connectivity* also has implications in the era of the COVID-19 pandemic. Although the survey was conducted pre-pandemic, the dependence on e-connectivity is likely to have increased since COVID-19 restrictions were implemented in the U.S. begin-

ning in March 2020. Evidence indicates that operators might rely more on online services to help keep potential customers informed about changes, particularly regarding COVID-19 mandates (Schmidt et al., 2020; Smith, 2020; Wicks, 2020).

For farms in the U.S., this means that not having connectivity to update their farm information, hours, and activities or being unable to accept wireless payment could be a setback for their operation. By increasing e-connectivity across all regions, operators may improve consumers’ awareness of their business and gain access to information and resources that may have previously been difficult to acquire.

In many locations, particularly in the South, challenges with *e-connectivity* result from availability and affordability of service (Figure 4). Most often, e-connectivity options are unavailable; where it is available, it is often costly and unreliable. However, in the modern e-connected world, not having this access reduces operational potential. Operators are frustrated with the lack of available services for areas where agritourism operations are located. As an operator in the American South wrote, “the lack of reliable high-speed internet is a huge issue for my education and also for the promotion of our farm and small business.” The lack of available, affordable e-connectivity services hinders operational growth and has implications for the finances of agritourism operators.

Open-ended responses from operators in the South support the results. Operators lamented that the “lack of reasonable priced internet access is almost crippling” because it hinders their ability to “provide connectivity for overnight guests” and for their ability to “handle business operations and business development.” The lack of internet access makes it harder for operators to attract guests to their operations and harder to advertise and conduct regular business. Moreover, the inability to connect online limits the operator’s ability to educate themselves on changes in local or state regulations and agritourism innovations.

For some operators, it is harder to operate without internet access as they are dependent on wireless options for all their business activity. In the Midwest, one operator noted they “started to accept credit cards but our internet is not reliable, so we have trouble with the system.” Others in the Northeast note that “since Airbnb is an online service, everything we do to manage our reservations, communication with guests, etc. depends on our internet to function. Unfortunately, it often does not.” As more and more operational management is dependent on internet access, the lack of affordable and reliable connectivity heightens

By having access to reliable internet service, operators can seek personal education, market their operations via digital platforms to draw in a broader consumer base and provide visitors with more offerings. Improved *e-connectivity* may also increase the ability for operators to be more innovative with their business models, which may help to improve financial stability.

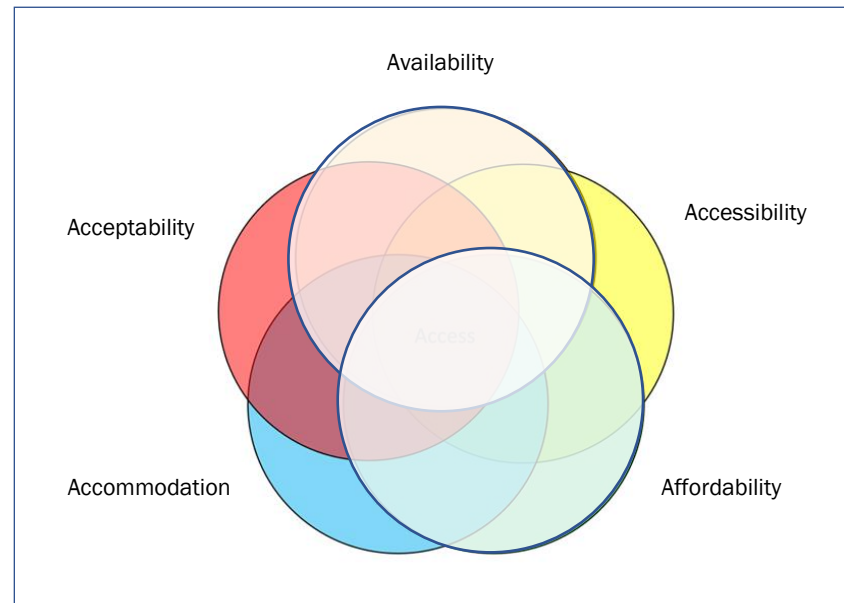
State and Local Regulations

The fourth ordered probit regression model sought to find differences *in state and local regulations* across regions. The results of our analysis support previous findings from Rilla et al. (2011) and Centner (2010), who emphasized the challenges created by state and local regulations and the resulting lack of access. Recent studies have shown that these regulations can be a hindrance outside of the U.S. as well (Paniccia & Baiocco, 2021). Our analysis shows that operators are 1.6 times more likely to have some challenges with regulations than not, but they are more likely to have many challenges compared to no challenges at all. The West was 1.5 times more likely to have such challenges compared to the Northeast. While the responses from the Midwest were similar to the Northeast, the South is less likely to have challenges around regulations compared to the Northeast.

Qualitative analysis found that the availability of information to both the operator and regulators was a key reason for challenges experienced in the West. An operator in the West explained, “Finding out, and then implementing the local regulations is very difficult. They [the local officials] give us the run-around, no one seems to know the answers, and each gives a different interpretation of non-sensical, bureaucratic rules.” These experiences hinder operators’ access to this resource.

Although agritourism operations can be a financially robust part of the local economy, many

Figure 5. Limits to Access Due to State and Local Regulations



regulators appear to be uninformed about agritourism, causing confusion among operators. This has led, in some cases, to payment for multiple certifications that do not meet the actual requirements of regulations. Operators can end up paying for extraneous fees to expand their enterprises, similar to issues seen with *zoning and permitting*. An operator in the West expressed these costs: “Between state and county regulations (and expenses) and focused insurance availability (and expenses), it’s usually been impractical to pursue larger events that would generate more revenue.” The cost of following local and state regulations mean that operators must choose between scaling up and gaining more revenue or maintaining their smaller, less-profitable enterprises (Figure 5).

Without the availability of regulatory information, it is particularly difficult for new operators start their businesses and operate legally. In the case of one operator in the West, they “have just stayed under the radar” of local rules and regulations but noted that “if they ever do [become an issue] (water, permits and permit application fees exceeding [US]\$1200) we will close instantly. Not enough margin in money or energy to deal with all of that.” As they made clear, for some operators, it is easier to operate without the required permits because the

permitting fees alone would drive them out of business.

Many operators also expressed confusion, as evidenced by one Midwest operator who commented on our survey, “From the research I’ve done, it sounds like the state laws supersede the county laws, is that correct?” This type of confusion is indicative of the problems many operators are experiencing and serves as yet another burden to their enterprise.

The challenge of *state and local regulations* is that, although there is an abundance of regulations, information on them is not easily available and the cost of compliance is high. Increasing accessibility information and increasing accessibility to service providers and officials who can provide timely and accurate guidance to operators can mitigate challenges. Additionally, scaling regulatory fees to reflect the farm’s size may reduce headaches for new and/or smaller operations that do not generate as much income.

Conclusions

This study’s purpose was to understand better the differences in challenges faced by agritourism operators in four regions of the United States. The quantitative analysis offered a deeper understanding of the various extents to which zoning and permitting, liability, e-connectivity, and regulations present challenges differently within three regions of the U.S. Specifically, we found operators in the West region were most likely to experience challenges around city and county zoning and permitting, concerns around agritourism liability and state and local regulations compared to other regions. We also found that operators in the South were 1.6 times more likely than those in the Northeast to experience challenges around e-connectivity, while the West and Midwest were not significantly burdened by the resource.

Qualitative comments made by operators support our quantitative findings. Operators felt that zoning and permitting were significant obstacles in their daily operations and sought more assistance from local officials to understand the complexities of these rules. Increased access to clear and timely information can reduce the costs associated with the inaccurate application of permit and zoning

laws. Liability challenges across the regions, and particularly in the West, Midwest, and South, were perceived to exist because visitors and insurers lack the necessary education. Where visitor education can reduce on-farm risk factors, insurer education can mitigate the problems caused by visitors on-farm. Operators, particularly in the South, noted the difficulty of running their operations without the availability of reliable internet, ranging from problems with credit card payments to the inability to educate themselves on new marketing and promotional tactics to expand their consumer base. Improvements to e-connectivity, including availability and accessibility, increase the opportunities for agritourism enterprises to expand their offerings to visitors and attract new consumers. The complexity of navigating state regulatory systems means low accessibility for operators, and a high cost of compliance, even where regulations are not flexible enough to fit the needs of an operation. Greater availability and accessibility to information can ease this burden for operators.

This study was limited by the use of in-network contacts, which increases bias in the responses, self-selection bias, and positive responses. It is also important to emphasize that these results are anecdotal. The snowball convenience sampling approach we took limited the number of responses in states with less active participation, resulting in a sample unrepresentative of the agritourism operator population in the U.S. Future studies using different sampling methods could provide insight into challenges that may better inform national-level policy and support mechanisms. It is also possible that the challenges we emphasized here are similarly significant to all small businesses, and not necessarily unique to agritourism. This study is not equipped to explore this comparison. Finally, the research team predetermined the variables we explored, which means that emergent challenges were ignored. Any possible emergent challenges from this data set should be explored in future studies.

The results of this study help to inform the field in three ways: support services for agritourism (e.g., Extension professionals, agritourism advocacy groups, and organizations), policy and regulations (policymakers), and future research (academ-

ics). Each of these three groups can increase access for operators by working in coordinated efforts, as discussed previously in the paper. Where service providers can increase the availability and accessibility of informational resources, policymakers can improve accommodation in regulations and e-connectivity services, and affordability of resources such as liability insurance and academic efforts can explore the acceptability of existing conditions that continue to create barriers to success. Agricultural service providers across the United States, particularly in the West, should offer understandable resources related to agritourism policies for operators. These resources must also be kept up-to-date, affordable (i.e., amount of time and effort to access), and easily available to operators. Additionally, a state-by-state resource should be developed to help operators find their state's policies and local key contacts who can interpret legal jargon and regulatory information.

Policymakers at community, state, regional, and national levels can use this information to understand better the impact of policies and regulations on agritourism operators. While policymakers may understand that agritourism aids farm profitability (Hollas et al., 2021), they may not understand how policy influences an operation's viability, particularly as related to liability concerns. Government officials and regulators need to be more aware of how policies are interpreted and applied, as well as how they are meant to be interpreted and applied, to ensure that operators are not overcommitting funds on unnecessary permits and

other requirements in order to comply. Policy-makers should consider the cost of operations as agritourism enterprises are often caught between multiple needs, often at the cost of either quality of life or production output. Creating policies that accommodate the needs of agritourism operators can have positive outcomes for local communities as money flows into rural communities from farm visitors.

Additional research and regional assessment are needed to understand the issues in availability, accessibility, and affordability of reliable e-connectivity in the South, as well as the economic implications for operators. This is particularly important as the COVID-19 pandemic continues to influence indoor activities, and there is greater interest in experiencing outdoor recreation, particularly on farms. Without adequate access, operators may lose customers due to the inability to market to a wider audience. Our study does not take into consideration the political and socioeconomic perspectives of farmers. Future research should also look at these perspectives and how they affect responses to surveys such as this one. Research is also needed on the impact of zoning and permitting and state and local regulations on operators in the West. The high cost of compliance and lack of accommodation of policies hinder the innovation and scalability in both directions for operators. Policymakers, service providers, and researchers like us must consider all the dimensions of access as we work with and for agritourism.



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Farmer attitudes and perceptions toward gleaning programs and the donation of excess produce to food rescue organizations

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Abstract

Food waste and food insecurity are two concurrent major public health issues. To address them, gleaning programs can reduce waste and enhance food security by diverting produce to food pantries. To understand the experiences of farmers and gleaning programs, interviews were completed with 12 farmers who had participated in a gleaning pro-

gram and 16 farmers who had not donated produce through a gleaning program within the Greater Kansas City metro area. For farmers who had participated in the gleaning program, the ease of donating and tax incentives were primary benefits. Inadequate experience and inefficient volunteers were cited as challenges. Farmers without experience with gleaning programs cited safety and liability issues as concerns. Because farmers communicate frequently with other farmers, food rescue organizations should consider enlisting their support. Communities and government agencies should provide financial support to improve the resources and infrastructure of gleaning organizations to improve farmer-gleaner relationships.

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Keywords

Food Insecurity, Food Waste, Food Loss, Gleaning Programs, Communication, Community Food Security

Introduction

Food waste and food insecurity are two concurrent and systemic public health, economic, and social issues in the United States (Lee et al., 2017). The U.S. Department of Agriculture defines food waste as wasted food, beginning at the farm and occurring anywhere in the supply chain (Minor et al., 2020). While it has been difficult to estimate a baseline for U.S. food waste due to variations in methodologies and measurement, a comprehensive analysis conducted by the nonprofit Rethink Food Waste Through Economics and Data (ReFED) estimates that the annual amount of food wasted in the U.S. is 62.5 million tons (ReFED, 2016). Much of this food thrown into landfills is nutritious, edible food (Gunders, 2012) that could provide much needed nourishment to food-insecure individuals and families. Defined as limited access to nutritionally adequate and safe foods obtained in socially acceptable ways (Anderson, 1990), food insecurity (FI) is a major public health concern which has been further exacerbated by the COVID-19 pandemic (Gundersen et al., 2020; Holben & Marshall, 2017). In 2020, it was estimated that 10.5 percent, or 13.8 million American households, struggled with FI (Coleman-Jensen et al., 2021). Moreover, it is estimated that an increased number of people in certain subgroups of the population, including among children, experienced FI in 2020. FI rates were higher over a 30-day period from mid-November to mid-December 2020 for households in which an adult family member was unable to work as a result of the pandemic (16.4% FI in the 30-day period), or was unemployed and unable to look for work because of the pandemic (20.4% FI in the 30-day period) (Coleman-Jensen et al., 2021).

In 2015, the Environmental Protection Agency (EPA) developed the evidence-based Food Recovery Hierarchy, a model prioritizing the actions that communities and organizations can take to prevent and divert food waste (U.S. Environmental Protection Agency, 2015). Each tier of the Hierarchy focuses on different management strategies, with

the top levels representing the most ideal methods to prevent and divert wasted food. For example, the second tier emphasizes addressing food insecurity through food donations to food banks, soup kitchens, and homeless shelters, thereby reducing food waste and supporting local communities.

Although composting in farming operations does not itself contribute to food waste, composting falls near the bottom of the Food Recovery Hierarchy, just above the last resort of sending food to landfills. It is estimated that 10.1 million tons of potentially edible fruits and vegetables are lost at the farm level each year, representing 16% of total food waste (ReFED, 2016). Though the reasons for lost or wasted food at the farm level are complex, it is important to note that very little waste is sent to landfills. Instead, unharvested crops are typically composted on-site or left to be tilled into soil (Kowalczyk et al., 2020; Sönmez et al., 2016). Thus, this potentially edible food from the farms could be used to address FI. In recognition of this, in recent years there has been increasing emphasis on resource conservation and more sustainable farming practices, to meet intensifying population demands (Kowalczyk et al., 2020; Minor et al., 2020; Rose et al., 2019). The American Academy of Nutrition and Dietetics released a position statement in 2017 advocating for systemic and sustained action to achieve food and nutrition security in the U.S, which included initiatives to promote access to fresh produce and food recovery programs (Holben & Marshall, 2017).

A possible solution that has gained attention in promoting food security is gleaning programs (Beyranvand et al., 2017; Hampl et al., 2005; Hoisington et al., 2001; Kowalczyk et al., 2020; Lee et al., 2017). Gleaning dates back to Biblical times, when Hebrew farmers were encouraged to leave a portion of their crops in their fields for poor community members and for travelers. Today, gleaning can be defined as gathering leftover fruits and vegetables after a harvest (Lee et al., 2017). Many gleaning programs recover leftover produce items as efforts to reduce food waste and address FI in their communities (Hoisington et al., 2001). Non-profit and religious organizations often serve as the backbone for the efforts (Hoisington et al., 2001; Vitiello et al., 2015). Gleaning programs are con-

sistent with the EPA Food Recovery Hierarchy, as gleaning promotes the second tier of the pyramid, to utilize potentially wasted food to feed hungry people (U.S. EPA, 2015). However, despite the feasibility and growing popularity of on-the-farm-gleaning programs, only a small portion of potentially edible food at the farm level is recovered through such programs (Minor et al., 2020).

Just as the reasons for food waste are complex, the reasons for the lack of U.S. gleaning programs are equally complex. At the forefront of many farmers' minds are liability concerns and legal ramifications of food donations (Minor et al., 2020). In an effort to address some of these concerns, in 1996 President Bill Clinton signed the Bill Emerson Good Samaritan Food Donation Act (Bill Emerson Act, 1996), which aims to absolve individuals, organizations, and businesses of potential civil and criminal liability for injuries, such as food-borne illness, resulting from the use of the donated items, with the exception of cases of gross negligence or intentional misconduct (Haley, 2013). Gleaning is a covered activity under this act. In addition to liability protections offered to farmers through this Act, in December 2015 Congress passed the Protecting Americans from Tax Hikes (PATH) Act, which permanently extends an enhanced deduction for tax-paying businesses, including farms, that donate food to food banks or other charitable organizations (Harl, 2016).

Despite the push to expand gleaning programs throughout the U.S. with the added liability protections and potential tax deductions, there is still a greater need to understand why there are only minimal food recovery rates at the farm level. Much of the literature thus far has focused simply on measuring and quantifying food losses at the farm level (Lee et al., 2017; Sönmez et al., 2016). Therefore, the purpose of this study is to explore facilitators and barriers among farmers to participate in gleaning and produce donation programs.

Methods

This study is part of a larger program evaluation of a food rescue organization in the Greater Kansas City metro region, After the Harvest (ATH), a non-profit that aims to fight hunger, improve nutrition, and reduce food waste. ATH provides a

volunteer program in which leftover produce is gleaned from fields and delivered to agencies feeding hungry people (ATH, 2021). As part of the program evaluation, telephone interviews were conducted with farmers who had donated produce to the gleaning program, as well as farmers who had never donated.

Participants

This study took place within the Greater Kansas City metro area and included farmers who had donated their excess produce to ATH, as well as farmers who had never donated produce. ATH program staff provided contact information for both groups of farmers.

Instruments

Two separate interview guides were developed and used for the phone interviews with each group of farmers. Questions were formulated based on an extensive literature review of other gleaning studies and reports, and specifically to conduct a program evaluation of ATH's gleaning program. For the farmers who had donated, a 23-item interview guide was developed that included questions involving the decision to donate, the facilitators and barriers to participating in the ATH gleaning program, the likelihood of continuing to donate, and demographic questions. An 8-item interview guide was developed for the farmers who had not donated to assess their knowledge of the ATH gleaning program, to understand what they had done with leftover produce in the past, and to assess their likelihood of participating in the gleaning program.

Procedures

ATH staff provided contact information for 116 farmers who donated to ATH in 2017 and 2018 via five different methods, with many farmers donating through multiple avenues. Table 1 provides a summary of each of the donation method categories. Within each category, farmer contacts were stratified by total number of pounds of produce donated to ATH and were categorized as low, medium, or high donors. Once stratified, contacts were randomly selected to determine which farmers to interview, which allowed for each farmer to

Table 1. Farmer Donation Methods

Donation Method	Description
Gleaning	Volunteers helped harvest donated produce at a farm or garden
Market Salvage	ATH picked up already harvested produce at the end of a farmers market
Farm Salvage	ATH picked up already harvested produce at a farm
Distributor Salvage	ATH picked up already harvested produce at a large-scale distributor or wholesale
Truckload Program	Large farmers or distributors that donate semi-truckloads at a time

have an equal chance of being chosen and which provided an unbiased representation of farmers. Multiple attempts were made to contact each farmer via phone, with some contacts also receiving emails from the evaluation study team.

In addition, ATH staff members shared contact information for 136 area farmers who could potentially donate produce to ATH but had yet to do so. Based on calculations of the number needed to provide an estimate that would accurately represent these other farmers, 56 farmers were randomly selected to participate in phone interviews. If a potential donor did not have a telephone number listed, then the farmer was replaced with another farmer contact among those remaining on the original listing. Of the 56 farmers selected, evaluation staff members attempted to contact each farmer three times.

Data Analysis

Audio recordings of the interviews were transcribed verbatim and were checked by researchers for completeness and accuracy prior to data analysis. Transcripts and field notes from the interviews were analyzed using the constant comparative method and data triangulation in order to identify recurrent themes (Denzin, 2017; Strauss & Corbin, 1990). After transcription, an open coding process was carried out. A priori codes were based on categories within the semi-structured interview guides, and exploratory codes were established during the open coding process. Researchers conducted a simple thematic analysis using immersion and crystallization techniques to finalize the themes (Crabtree & Miller, 1999). All data was analyzed separately and then brought back together to find convergent themes across both transcripts and field notes and all research team members.

Results

Twelve farmers who had participated in ATH's gleaning program and sixteen farmers who had never donated through the gleaning program were interviewed. For clarity, we have organized the interview results according to those farmers who had participated and those who had not.

Experience with Gleaners

Twelve farmers reported that they had had ATH gleaners come to their farm or orchard to glean excess produce. Table 2 provides demographic information of the farmers who had participated in ATH's gleaning program. Results from the interviews were categorized into four main themes. A summary of key interview quotes for each theme can be found in Table 3.

Theme #1: Decision to Donate. Farmers who had donated produce through the program had learned about it primarily through word of mouth from other participating farmers. Farmers also commented that they had received information through direct mailers from ATH providing information about their programs and services. Unequivocally, the decision to participate in the ATH gleaning program was attributed to three primary reasons: to reduce waste, to put the unharvested produce to good use by donating to an organization dedicated to addressing FI, and for the tax incentives that are offered to farmers for food donation. Many of the farmers were acutely aware of the FI problem within their region because as farmers, their own livelihood of food production had often strained their own budgets. As one farmer explained:

I like to see it [produce] get used. It's always a shame to till-in, you know, that you just

Table 2. Farmers Who Had Donated Demographic Information

Farmer Characteristics	Farmers Who Had Donated (n)
Race/Ethnicity	
African American/Black	1
Caucasian/White (not Hispanic)	11
Total Years Farming	
<10 years	4
10–20 years	5
>20 years	3
Farm/orchard income (past year)	
<\$10,000	2
\$10,000–\$99,999	3
≥\$100,000	3
Size of Farm	
<5 acres	7
5–10 acres	2
>10 acres	3
Number of years donated	
≤2 years	2
2–9 years	7
≥10 years	2
Produce Grown	
Variety of fruits and vegetables	4
Variety of vegetables	7
Fruit	1

destroy a crop that has a calorie value to somebody...I'm fortunate that with the ability to grow I'm not food insecure, but I also live on a budget, you know, and on an income that many people would be considered food insecure with. And so I know how tight it can be as an individual in food so the least we can do is give back what we can to our community.

It is also important to note that farmers indicated that without the gleaning program much produce would have been left in the field to be tilled into the soil. Farmers left product in their field often because of the poor appearance of the produce, which they knew would not sell at farmers markets or other local businesses. While the

nutritional quality of these products was the same as other produce, farmers admitted that many of these products would have been left in the field to be tilled into the ground or for composting. Farmers reiterated that with the gleaning program, they knew they were able to put this produce to better use by meeting a social need within their community.

Theme #2: Benefits from Donating. For this theme, farmers once again emphasized that one of the primary benefits of gleaning was putting unharvested produce to good use within their community. Specifically, farmers focused on the ease of donating through the gleaning program. The farmers appreciated the efficiency and communication efforts of ATH staff and volunteers to facilitate the process. Farmers commented that it was extremely easy for them to participate, as they did not have to expend their own time, effort, and staffing to harvest the unused crops. As one farmer indicated: "I know the produce is being used and I know that the people who come to do the gleaning have been trained so they're respectful of my garden. They're not stepping on everything and they follow the instructions that I request. So they only harvested the pieces that I asked them to." Additionally, the consensus among the farmers was that there was accurate reporting by ATH staff on their produce donations, which facilitated their use of the federal tax incentives.

Theme #3: Barriers to Donation. Interestingly, farmers cited very few barriers to participating in the ATH gleaning program. The barriers that were cited were more the result of a short window of time to glean specialty crops and a shortage of volunteers showing up to glean the larger crops. In addition to a shortage of volunteers, two farmers also reported staff showing up with inadequate resources, such as pallets or containers, to collect the harvested produce; in these instances, the farmers provided what was needed from their own supplies. Farmers also cited constraints on their own operational side, in that they were extremely busy, especially during the growing season, and sometimes lacked oversight on their end to think ahead to schedule gleaners to come to their farm. One farmer reported that during the growing season he regularly gets over 100 phone calls a day, and he

had missed a call or voice message from gleaning staff. Another farmer indicated feeling that communication was poor with ATH staff, as the information the farmer provided them from year to year was not taken into consideration or followed up

upon in subsequent years.

Theme #4: Likelihood of Continuing to Donate Through the Gleaning Program. The farmers were asked if they would continue to donate through the ATH gleaning program. Of the

Table 3. Experience with Gleaners: Themes, Subthemes, and Key Quotes

Themes and Subthemes	Key Quotes
Theme #1: Decision to Donate	
Subtheme 1.a. To Reduce Waste	<ul style="list-style-type: none"> ▪ "I just thought it was a better use than just letting it go to waste." ▪ "Because we don't believe in wasting food."
Subtheme 1.b. To Help Food Insecure Individuals and Families	<ul style="list-style-type: none"> ▪ "I feel good about having more options to get our produce into people's hands." ▪ "I knew that they [ATH staff] would distribute it [produce] where it was needed" ▪ "They [ATH staff] distribute [the food] to all different pantries around the town...They share the wealth."
Subtheme 1.c. For Tax Incentives	<ul style="list-style-type: none"> ▪ "Well, primarily because there's a tax break...you can write it off on your taxes. I think they would do a much better job if they would market to the growers that way." ▪ "Tax deductions."
Theme #2: Benefits to Donating	<ul style="list-style-type: none"> ▪ "With their gleaning crew we can just tell them where it's at and if it's in a field we're working in at the time, we can just kind of show them and walk away and continue our stuff on the other side of the field or something...And so that makes it easy to donate on our end when we aren't having to dedicate much staff time to, you know, caretaking the volunteers." ▪ "Well number one, we know that this is the right thing to do...because we believe in what they're doing. And it's the most valuable use of that produce." ▪ "Well, what's there not to like? I mean it's mostly volunteers, people who are doing a good deed and seeing that things don't go to waste. Doing it for people that need it. So, it's a no brainer, really." ▪ "[I appreciate] just how efficient they [ATH volunteers] are...and it's just a way to feel like I'm giving back without really doing the effort."
Theme #3: Barriers to Donation	<ul style="list-style-type: none"> ▪ "I guess my biggest barrier/complaint is we raise a lot of specialty produce, a lot of fruits and berries. They have a very short shelf life and if we have extra or in the past have wanted them [ATH volunteers] to glean, a lot of times they can't get here soon enough. Or, I'll donate something and they'll need ten people to harvest and they'll show up with two [volunteers]." ▪ "I'd say the barrier on our end is just being too busy. Sometimes it can be hard to coordinate something...at 50 acres we're one of the largest vegetable producers in our area. And we're with a limited staff...and so it just comes down to labor constraints and timing and all of that. It can just be hard for me to look two weeks ahead and go, 'oh, we're going to have extra spinach' and then call them and get it all coordinated. Usually we have a quick turnaround time of when we decide a crop is done, terminate it, and get something else planted...and we can miss out on opportunities just frankly because of timing." ▪ "Here in the past year or two they've had some containers and stuff. I think they finally have a budget for that. A lot of times we've had to supply boxes and picking stuff."
Theme #4: Likelihood of Continuing to Donate Through the Gleaning Program	<ul style="list-style-type: none"> ▪ "[I'm] very likely [to have ATH gleaners come back to my farm]. Because I know the produce is going to be used. Because I believe in their mission, and because they're well-trained staff and nice people." ▪ "100 percent [I will continue to use the ATH gleaning program]. So we don't waste food...because they [ATH volunteers] were very capable and they get through things fast and they show up at even a last minute call- they'll send somebody over." ▪ "Not as likely as in the past. Sometimes it's just not worth the hassle, to be quite honest with you...the last few years [we] haven't been contacting them as much as we had. We'll just find an alternative use for it or just let it rot."

twelve farmers, ten indicated they were very likely to continue to donate, one indicated they would likely not continue to participate, and one farmer did not respond. All the farmers reported that they would recommend other farmers to participate in the program and had done so in the past.

Of the ten farmers that indicated they would continue donating through the program, their responses echoed much of what has been indicated in the previous themes. First, the convenience and efficiency of having someone else come to their farms to do the harvesting made their continued participation likely. Second, they knew that the food was going to an organization that would distribute it to food banks. As one farmer explained, “They’re [ATH] an amazing resource and I just hope other farmers would take advantage of such a program. This food has to be ... used and valued by other people and it’s not when we end up wasting it.”

For the one farmer who indicated that they most likely would not continue to participate, their reasoning included the need to harvest specialty crops within a short timeframe, and the lack of experience of volunteers that were sent to do the gleaning. The latter was cited as one of the barriers to participating in the gleaning program. The farmer explained, “Sometimes their [ATH] intentions and what actually gets done are a little ways apart.”

Farmers Who Had Not Participated in Gleaning Programs

Of the 56 farmers who had never donated to ATH and were contacted, sixteen farmers (28.6%) were interviewed. Among the 40 potential donors who were not interviewed, one farmer declined to be interviewed, 18 farmers did not answer or return calls after repeated attempts, ten telephone numbers were incorrect or no longer in service, seven farmers were no longer growing produce, and four contacts were not produce growers. Table 4 provides farm characteristics of the 16 farmers who were interviewed. Interview transcripts were categorized into themes including current farming and donation practices, knowledge of ATH, and likelihood of participation in the ATH gleaning program.

Current Farming and Donation Practices.

When asked what share of their produce the farmers sell, a variety of responses were received. Eleven of the 16 farmers (67%) reported selling their produce. Eight farmers stated they sell all the produce they grow, one reported selling about 90%, one farmer sold about 75%, and another farmer sold about 50%. One farmer reported being unsure of how much produce is sold because they operate a “you-pick” farm and they do not harvest the produce.

For the growers who reported not selling their produce, three farmers reported they donated all their produce to schools, educational initiatives, local churches, or social service organizations, such as Catholic Charities, Salvation Army, and food pantries. A different grower was affiliated with a private raised-bed community garden that rents out space to individuals.

Nine potential donors reported having excess produce that they were not able to sell. When asked what they did with their excess produce, seven of the nine potential donors reported having destinations for it. Six farmers reported donating

Table 4. Farm Characteristics for Farmers Who Had Not Participated in Gleaning Program

Farm Characteristics	Farmers Who Had Not Donated (n)
Type of Farm	
Farm	11
Urban farm	2
Raised-bed community garden	2
Orchard	1
Total Years Farming	
<10 years	5
10–20 years	8
>20 years	2
Size of Farm	
<5 acres	10
5–10 acres	2
>10 acres	4
Produce Grown	
Variety of fruits and vegetables	10
Variety of vegetables	5
Fruit	1

the produce to food pantries and other agencies, and one farmer provided their excess produce to family members. For the farmers who were not already donating excess produce, they were somewhat to very willing to donate to local food pantries.

Knowledge of ATH and Future Likelihood of Donating to the ATH Gleaning Program. Farmers were asked if they had heard of ATH, and thirteen farmers indicated that they were familiar with the organization. When asked if they would be interested in having volunteer gleaners come to their farm to harvest excess produce, most farmers indicated that they would. Eleven (67%) indicated that they would potentially be willing to participate in the program if they had excess produce in their fields, one farmer indicated that they did not have excess produce, one farmer was not asked, and three farmers responded that they would not be interested. For the three farmers who reported that they would not want to participate, one farmer indicated that they had plenty of help to harvest excess produce. A second farmer explained, “I just don’t want somebody out here fooling around.” The third farmer indicated that “there’s a little bit of a liability issue. My tax people and attorneys told me about that. I think that’s a good program, but I don’t think we’re much of a fit for it...”

Discussion

While food waste at the farm level appears to be much less compared to consumer-facing industries (ReFED, 2016), current research suggests that unharvested produce items could be donated to address FI within communities, and to meet the second tier of the EPA Food Recovery Hierarchy (Hoisington et al., 2001; Kowalczyk et al., 2020; Lee et al., 2017; Minor et al., 2020; Sönmez et al., 2016). Gleaning has been proposed as one method to recover leftover produce items from the fields. While it is important for communities to understand the infrastructure and support in place necessary to develop efficient gleaning programs, it is equally important to understand the perceptions of donation through gleaning programs, both from the viewpoint of farmers who have donated through gleaning programs in the past, and from those farmers who have not donated. This study

attempted to fill in some of the current gaps in the literature by interviewing both groups, and to further explore and understand farmer perceptions of gleaning programs, and the facilitators and challenges to participating in such programs.

In this study, the feasibility and efficiency of participating in a gleaning program were two of the more consistent findings from the farmers who had donated. However, farmers also acknowledged how busy they were, particularly during the growing season, and that it was sometimes difficult to coordinate with gleaning program staff the times that volunteers could come to glean their fields. One primary barrier reported by farmers was lack of time to communicate with ATH staff about excess produce that needed to be gleaned. While farmers reported that ATH staff was generally consistent in reaching out throughout the year to extend their volunteer services, responding to forms of communication such as phone calls and mailers was not prioritized due to the daily operations of overseeing and running a farm. Although some farmers reported they already donated their excess produce to food pantries and other agencies, they potentially could partner with ATH to simplify the donation process without needing to have volunteer gleaners come to their farm. Through their market salvage and farm salvage programs, ATH is able to have volunteers travel directly to farmers markets and farms to pick up excess produce that has already been harvested, which would allow farmers to donate their produce without additional time or effort added to their already busy schedules. With the mechanisms that they already have in place, ATH ensures produce already harvested can reach food pantries and other agencies in a timely and efficient manner without an added burden to the farmers.

While most farmers in this study reported satisfaction with the efficiency of gleaning volunteers, a couple of farmers indicated some issues with the volunteers who came to their farms. Lack of efficiency and training of volunteer staff, inadequate number of volunteers, and insufficient resources were cited as primary concerns. Farmers noted that they had very little time to oversee the gleaners, so trust in the gleaning organization and its volunteers to be well-trained and efficient was critical for

them to continue their participation in the program. This aligns with prior research from Lott and colleagues (2020) that successful gleaner-farmer relationships were grounded in trust and a farmer-centered process. Although gleaning programs often heavily rely on volunteer staff, it is advantageous for the organizations to properly and rigorously train staff and volunteers prior to gleaning, and to ensure that the appropriate amount of resources, such as pallets and crates to hold the produce, are available. Adequate training of volunteers, along with signing liability waivers, protects farmers from liability concerns and is a vital aspect of gleaning programs (Kowalczyk et al., 2020). Furthermore, it is important for staff to understand the types and amounts of produce to be gleaned, so that an adequate number of properly trained volunteers are on site to relieve farmers from having to oversee such activities. In sum, efficient processes are needed to optimize gleaning schedules so as to improve gleaning operation performance and to scale up programs, increasing the amount of crops rescued. Allocation of funding from communities and government agencies to improve the resources and infrastructure of food rescue organizations would facilitate this process (Lee et al., 2017).

It is worthwhile to note that nearly all farmers in this study, both those that had participated in gleaning programs and those who had not, are interested in reducing food loss and providing healthy food for vulnerable individuals and families in their communities. This aligns with prior research in which farmers agreed or strongly agreed that gleaning programs are useful in helping to increase access to fruits and vegetables in low-income areas (Lanier & Schumacher, 2017). However, as research has indicated, farmers are concerned with liability issues, and many are unaware of the tax incentives available from participating in such programs (Kowalczyk et al., 2020). For farmers that had participated in gleaning programs, they emphasized that this is important information to communicate. Furthermore, there should be emphasis on helping farmers to understand liability protections that are in place to reduce their concerns about donating food to organizations, or having volunteers glean produce from their farms.

One notable finding from this study is the amount of communication between farmers. Many farmers had heard about the ATH gleaning program through other farmers, and they also spoke with one another about their experience with the program. Farmers discussed the ease or difficulties of participating in the program, which could further facilitate or impede other farmers to participate in gleaning programs. Discussion could also serve as an opportunity for farmers to understand more about the tax incentives and liability protections through conversations with one another. As communication was a key factor that farmers cited in either participating in the program, or fully participating throughout their harvest season, the communication between farmers could serve as an important facilitator to foster the use of gleaning programs among farmer communities. This finding is rooted in foundational research on communication within social systems or specific populations (Valente, 1993; Valente & Rogers, 1995). The communications theory of the diffusion of innovations is grounded in rural sociology, describing the adoption of new practices or ideas that gain momentum and spread throughout a social system. The interpersonal communication between farmers about farming practices and new technologies served as the foundation for this theory (Rogers, 2010). Though gleaning itself is not considered an innovation, the very nature of communicating with other farmers about gleaning programs, liability protections, and tax incentives are enough to consider applications of this theory to recruit farmer stakeholder recruitment and participation.

Limitations

There are limitations to this study that should be taken into account by future research studies. First, our study sample included farmers within a specific geographic region, limiting the generalizability of our findings to other areas. However, we randomly selected farmers to enhance representation of low, medium, and high donors to approximate what would have been obtained if we had interviewed all listed farmers. Although our sample size was small, other researchers have found similar findings when examining gleaning facilitators and challenges. The main purpose of the farmer interviews was to serve

as a program evaluation tool for ATH's gleaning program, while the original intent of interviewing farmers who had never donated was to gauge interest in donating to ATH in the future. Subsequently, only limited information about demographics and crops grown were collected. Future research efforts should collect important farmer characteristics and type of major crops grown. In addition, the use of both quantitative and qualitative approaches to explore farmer perceptions, attitudes, and participation in gleaning programs would strengthen and add richer detail to our study's findings. Third, this study only gathered data from the farmer perspective. Future research should incorporate perspectives from both farmers and gleaning agencies to understand how successful relationships can be built and sustained between these two entities.


Conclusions

Food waste in the U.S. is a significant environmental, economic, and social issue that warrants much more attention. Likewise, increasing rates of FI, which are projected to rise even further due to the COVID-19 pandemic, remain a critical public health issue (Gundersen et al., 2020; Wolfson & Leung, 2020). By addressing food waste and food loss, communities could help to create a more sustainable food environment in which potentially wasted food items are used to provide nutritious and healthy food for vulnerable populations (Galanakis, 2020). Field gleaning is one potential solution that could help address FI within communities, while simultaneously reducing food waste, creating a more sustainable environment, and thus fulfilling the second tier of the EPA Food Recovery Hierarchy. Moreover, gleaning leftover produce from fields to donate to food banks facilitates the availability of healthier food options for food insecure individuals and families, who typically have poorer diet quality and an increased risk for diet-related diseases than their food-secure counterparts (Gundersen & Ziliak, 2015; Holben, 2010).

Results from this study present two noteworthy findings that community agencies should consider when developing and overseeing gleaning programs. First, it is critical for agencies that oversee gleaning programs to ensure that volunteers are

well-trained and that adequate staffing and resources are available to glean the produce. This alleviates burdens on the farmer side to oversee gleaning operations. Furthermore, agencies should be more proactive in keeping records of different farmers and the type of produce they grow and when it is most likely available for gleaning.

Second, it is important to emphasize the extent of interpersonal communication that occurs between farmers. Gleaning agencies should consider recruiting a farmer champion within their community who has worked with gleaners and would be willing to speak with other farmers about the programs that are available, including the liability protections and tax incentives. Perhaps this could help to further facilitate the growth and use of gleaning programs by farmers.

Both food waste and FI are complex issues, and communities must take on a more collaborative and holistic approach to strengthening their food system. One such method is for community agencies to work with farmers in the development of gleaning programs. The literature supports the acceptance and feasibility of gleaning programs as simultaneously reducing food loss at the farm level while providing nutritious foods to low-income families (Hoisington et al., 2001; Kowalczyk et al., 2020; Vitiello et al., 2015). However, it will take a thoughtful and collaborative approach that entails building relationships with farmers and advocating for a strong farmer voice to support the growth of such programs. Likewise, agencies need to ensure that they have the infrastructure, support, resources, and volunteer network in place to facilitate a strong gleaning program. This will require collaborative action from multiple community agencies and farmers, but is a feasible way to reduce food loss and promote food recovery efforts at the farm level. 

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Community food systems resilience: Values, benefits, and indicators

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Abstract

There is increasing awareness that community food policies and programs can address issues of equity, sustainability, profitability, and resilience in food systems. Community coalitions, local governments, food policy councils, cooperative extension, and

other stakeholders seek to improve community food systems through policy and programmatic development. However, these groups often do not know what types of policy or program models exist to help achieve their goals. This research identified expert consensus on three important topics related

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Conflict of Interest Disclosure

JAFSCD Editor in Chief Duncan Hilchey participated in the early conceptualization of this project and later as a member of the Delphi panel of experts. He managed the JAFSCD peer-review process of this manuscript, but he did not serve as a peer reviewer.

to community food systems resilience: (1) values that should guide adopting and implementing policies and programs to facilitate community food systems resilience, (2) benefits of adopting policies and programs that support community food systems resilience, and (3) policies, programs, and initiatives that are indicators of resilience. These indicators can be used to assess the resilience of communities and to help communities identify policy options to achieve specific goals and objectives. The results of this study were used to create a community food system resilience audit tool that community groups can use to assess the current resiliency of their food system, identify priorities, and set goals. The audit tool focuses on seven core themes that contribute to community food systems resilience: agricultural and ecological sustainability, community health, community self-reliance, distributive and democratic leadership, focus on the farmer and food maker, food justice, and place-based economics. The individual indicators in this audit tool provide specific policies and practices that can be adopted by local governments, supported by cooperative extension agents, and advocated for by food policy councils and community-based organizations.

Keywords

Local Food Policy, Resilience, Equity, Indicators, Sustainability, Community Health, Food Justice, Values, Regional Economics, Local Government

Introduction

There is increasing awareness that effective community food policies and programs can address issues of equity, sustainability, profitability, and resilience in food systems (Béné, 2020; Calancie et al., 2018). Community coalitions, local governments, food policy councils, cooperative extension, and other stakeholders seek to improve community food systems through policy and programmatic development. However, often these groups do not know what types of policy or program models exist that could help achieve their goals—from the broad goal of increasing the overall resilience of their community food system to targeted goals, such as increasing food access or reducing food insecurity in their community. While policies alone

do not create resilient community food systems, policies can create a supportive environment in which producers, consumers, and community groups can work alongside local governments to develop initiatives and pursue mutual goals.

The purpose of this study was to identify expert consensus on three important topics related to community food systems resilience. First, we identified the most important values that should guide adopting and implementing policies and programs that facilitate community food systems resilience. Second, we identified the benefits of adopting policies and programs to support community food systems resilience. Third, we identified policies, programs, and initiatives that are salient indicators of resilience, capable of both assessing the resilience of communities and helping communities to develop specific goals and objectives.

The results of this study were used to create a community food system resilience audit tool that community groups can use to assess the current resiliency of their food system, identify priorities, and set goals. The policies and programs that are indicators in this audit tool provide specific policies and practices that can be adopted by local governments, supported by cooperative extension agents, or advocated for by food policy councils or community-based organizations. While communities differ in the extent to which they use formalized policies to achieve goals, we sought to identify resilience-strengthening policies broadly applicable to communities, because food systems resilience should not be available only to those communities with the resources or support required to implement policies. This audit tool is intended to be applicable to any community—rural or urban, well- or under-resourced.

We begin with an overview of the concept of resilience and the key characteristics of resilient systems, focusing on how the concept and characteristics apply to food systems resilience. The overview of how the concept of resilience applies to food systems is organized based on the key themes in the community food system audit tool that was created from the results of this study. We then briefly discuss previous examples of food system resilience indicators and frameworks to frame the purpose of this study. Finally, we discuss the

results of the community food system resilience Delphi study, which provides a list of the key values, benefits, and indicators of community food systems resilience based on expert consensus.

Review of Literature

Applying the concept of resilience to communities is relatively new, as the concept's historical roots are in biological systems. Following COVID-19, there is increased discussion about community food systems resilience (Béné, 2020; Dou et al., 2021). Below, we discuss the historical roots of the concept of resilience and trace its path to its application to community food systems. Since this literature is extensive and wide-ranging, the literature review is organized to provide readers with a foundational understanding of the evolution of the concept of resilience, which we believe is necessary to understand the community food system resilience audit tool.

In the wake of increasing environmental, economic, and social challenges, food system resilience is important because of its adaptive capacity to address acute and chronic disturbances (Tendall et al., 2015). Strategies to strengthen and improve the food system frequently take a sustainability approach by seeking to ensure that food production, distribution, and consumption meet community nutritional needs without depleting or harming future resources (Willett et al., 2019; Worstell & Green, 2017). However, as sustainability measurements have been developed, resiliency takes a complementary approach: "sustainability is the measure of system performance, whereas resilience can be seen as a means to achieve it" (Tendall et al., 2015, p. 18). Thus, sustainability and resiliency are integral to meeting goals associated with individual health outcomes, community development, and environmental sustainability (Worstell & Green, 2017).

Background

The concept of resilience is predicated on the understanding that "uncertainty and surprise is part of the game and you need to be prepared for it and learn to live with it" (Folke, 2006, p. 255). Resilience concepts have been operationalized to explain consequences of disruptive processes in

individuals or populations since the 1970s, drawing from the ecological and biological sciences to describe how low- and high-stability populations in biological systems (e.g., insects, mammals) adapt, transform, or maintain equilibrium in the face of environmental disturbances (Holling, 1973). Since its emergence and widespread application in the sciences, resilience has been characterized across a variety of disciplines as an attribute of systems that describes capacity to perform under adversity. Definitions and indicators have been adapted to apply to psychological, developmental, social, community-based, and economic domains (Lesnick et al., 2013).

Examples of resilience indicators include: buffer capacity (Ifejika Speranza et al., 2014), resource allocation and availability (Worstell & Green, 2017), adaptation and transformation (Folke et al., 2010), diversity (Bousquet et al., 2016; Cabell & Oelofse, 2012), and capacity for learning (Bousquet et al., 2016; Cabell & Oelofse, 2012; Ifejika Speranza et al., 2014). How these indicators are manifested in specific communities is based on the unique needs, culture, or geography of the people, animals, families, or institutions that inhabit those systems (Lesnick et al., 2013).

It is important to note that food systems resilience is not one-size-fits-all. The specific resilience goals for any food system depend on community consensus and expert opinion, and the extent to which a system or community can meet goals depends on its willingness to self-evaluate and employ relevant measures (Ifejika Speranza et al., 2014; Tendall et al., 2015). Resilience itself is not a "finite or objective outcome, but rather a continually contested process of responding, adaptation, and livelihood making" (Walsh-Dilley et al., 2016, p. 6). In this sense, resilience itself is an emergent property of a system whose "capacities are linked and act together" (Faulkner et al., 2018, p. 1).

Social Ecological Systems Resilience

Social-ecological systems (SES) perspectives on resilience focus on the interdependency of humans and the environment (Folke et al., 2010). The functioning of a social system impacts the ecological-environmental outcomes of water sources, soil health, and climate, while engaging in a reciprocally

deterministic relationship with the physical and mental health outcomes of people in the system (Cabell & Oelofse, 2012; Worstell & Green, 2017). From this perspective, ecological or social resilience on their own without integrated support exacerbate the other's weakness. SES resilience focuses on strengthening social and environmental systems together, buffering against both social and environmental disturbances, and utilizing disturbances as windows of opportunity to meet community needs (Folke, 2006).

Food systems are SES by nature—they require integrated management of land, soil, and human capital to produce essential goods. Their ecological success is enhanced by social constructs: “self-organization capacity, governance capacity, transformability, transparency, learning capacity...as well as the existence of an appropriate institutional framework with equitable rights, entitlements and decision-making processes” (Tendall et al., 2015, p. 20). As SES resilience perspectives have evolved within food systems research and practice, a number of approaches have been advanced to build SES-informed frameworks and indicator models for use by practitioners, researchers, and local governments (Worstell & Green, 2017). These approaches include: community and livelihood (Faulkner et al., 2018; Ifejika Speranza et al., 2014), agroecosystems and agriculture (Cabell & Oelofse, 2012; Ludden et al., 2018), food security (Tendall et al., 2015), and sovereignty (Walsh-Dilley et al., 2016).

To improve or strengthen SES food systems resilience, indicators must be identified, validated, and measured (Tendall et al., 2015). In Baltimore, for example, the city integrated the food system into an all-hazard mitigation plan with the ultimate goal of improving chronic and acute food insecurity by addressing “preparedness, response, recovery, and adaptability of stakeholders across the system, from farms to processors and distributors, food pantries and stores, and communities” (Biehl et al., 2018, p. 41).

General resilience and specified resilience

General resilience refers to how the elements of a system cooperatively cope with all types of disruptions, while specified resilience refers to the partic-

ular values that compose the system's overarching goal, posing the question: “resilience *of* what, *to* what”—e.g., resilience *of* aquaculture *to* algae blooms, or resilience *of* fruit and vegetable access *to* global pandemics (Folke et al., 2010, p. 4; Walsh-Dilley et al., 2016, p. 5). Examples of specified resilience indicators include systems of leadership or the ability to self-organize, the extent to which community members experience place attachment, bonds between community networks and community cohesion, knowledge of the system or recent memories of overcoming previous disasters, and the capacity to learn new things (Faulkner et al., 2018). Specified resilience indicators together help achieve the general goal of the system, addressing broad social and ecological indicators, including environmental sustainability, community self-reliance, leadership and decision-making, focus on food producers, and place-based economics (Cabell & Oelofse, 2012; Ludden et al., 2018; Worstell & Green, 2017). The absence of any of these indicators in reaching resilience goals may not only weaken resilience, but indicate system failure (Cabell & Oelofse, 2012; Walsh-Dilley et al., 2016).

General and specified resilience goals are particularly important to identify at the outset of policy formation because general goals, pursued without specified goals, can undermine resilience (Tendall et al., 2015). Food security, defined as when food is sufficient, appropriate, and accessible to all members of the community (Bousquet et al., 2016; Tendall et al., 2015), and food sovereignty, defined as a person's “right to define their own food and agricultural systems in culturally and ecologically appropriate ways” (Walsh-Dilley et al., 2016, p. 1) have been considered general goals of resilient food systems by those working in local governments (Biehl et al., 2018). However, in some cases, a resilient system can exacerbate inequality or poor community health through rigidity or poverty traps (Bousquet et al., 2016; Folke et al., 2010; for example, in underserved neighborhoods when there is a consistent supply of food, but the foods are calorie-dense, nutrient-poor, and only available at convenience stores. The availability, access, stability, and proper utilization of resources should follow the central principles of both resilience and food security, reflecting the natural conceptual par-

allels between them (Bousquet et al., 2016; Walsh-Dilley et al., 2016).

Adaptability and transformability

Adaptability and transformability are innate characteristics of resilience (Lesnick et al., 2013). When faced with adversity, resilient systems meet their general and specified goals as a result of effective adaptation and/or transformation. Adaptability is the extent to which individuals or the community can influence and make adjustments when faced with shocks or disturbances (Folke et al., 2010; Lesnick et al., 2013). Transformability, on the other hand, is a system's ability to perform robust systemic change, either by choice or because a disturbance is great enough to require it (Folke et al., 2010). Systems that are sufficiently prepared can utilize crises as windows of opportunity and transform themselves to be resilient in new ways (Bousquet et al., 2016). While the question of when to adapt versus when to transform continues to be investigated (Bousquet et al., 2016), some contend it depends on the system's self-reflective capacity and organizational leadership (Worstell & Green, 2017). There is also the question of *what* to change: will the system require shifts in social perspectives and attitude, or tangible inputs such as a seed or a tool, or both? Is the community willing and prepared to do what needs to be done?

Diversity

Diversity in a well-managed system can ensure contingencies and promote innovation (Cabell & Oelofse, 2012). Resilient communities have a diversity of complementary enterprises to strengthen the bonds and bridges within networks that allow them to work harmoniously and support the growth of one another, rather than compete (Duncan et al., 2018; Walsh-Dilley et al., 2016; Worstell & Green, 2017). Resilient communities are diverse in landscape and seascape, institutions, actor groups and networks, governance support, forms of collective action, and learning platforms (Folke et al., 2010). Racial, ethnic, and gender representation, explicitly inclusive of female and/or non-white principal farm operators, are also critical indicators of diverse approaches to strengthening resilience (Ludden et al., 2018).

Diversity thresholds vary among individual food operations. Too much diversity, such as growing an unmanageable number of crops, or relying on too many different market channels to remain economically viable (Sanderson Bellamy et al., 2021), can drain resources and human capital, and thus reduce resiliency (Cochrane & Cafer, 2018). Although farm livelihood and survival is dependent on a diversity of income streams to enhance overall revenue (Bousquet et al., 2016), the ability to diversify depends on the farmer's resources, assets, and ability to make investments towards diversification (Cochrane & Cafer, 2018).

Agricultural and ecological sustainability

Effective management of agricultural and ecological sustainability is a central theme of resilient food systems, prominent in food systems resilience literature (Cabell & Oelofse, 2012; Duncan et al., 2018; Ludden et al., 2018; Worstell & Green, 2017). Progressive agriculture, a concept developed from both resilience and sustainability, is a "multidimensional, evolving agricultural system that benefits the social, economic, and environmental conditions of communities" (Ludden et al., 2018, p. 167), which aptly centers agriculture within the SES perspective and operationally demonstrates the importance of its influence.

Actors within a resilient food system, driven by environmental conscientiousness (Duncan et al., 2018), work "with nature to minimize imported manufactured inputs, moving toward ecological integration" (Worstell & Green, 2017, p. 37). Improved soil health, water retention, and ecological biodiversity allow farms to produce foods sustainably with minimal inputs and reduce adverse environmental impacts (Worstell & Green, 2017). Using organic growing practices (Ludden et al., 2018), promoting conservation innovations, supporting and building soil and water resources, and facilitating ecological self-regulation using cover crops, perennial plants, and polycultures make up the sustainable agricultural and ecological contributions to resilient food systems (Cabell & Oelofse, 2012).

Community health

Community health has generally not been consid-

ered an indicator of food systems resilience. Rather, policies or programs often are implemented because of a deficit in community health, such as lack of access to nutritious foods or prevalence of nutrition-related chronic disease. For this reason, strengthening food systems resilience can be a means to address that deficit (Biehl et al., 2018). It has been suggested that community health indicators are results or outcomes of food systems resilience, rather than a measure of resilience (Worstell & Green, 2017). Community health and resilience exist in a cyclical relationship, in which individual health and well-being begets a more active contribution to and perpetuation of resilience within the community. A resilient food system provides accessible and affordable nutritious foods that provide community members with the “physical, mental, and emotional benefits of being nourished properly, longevity, and optimal health, and hence not only survive but thrive” (Alesso-Bendisch, 2020, p. 29).

Community self-reliance

Defined as the adaptability, dependability, and capacity of the community to effectively respond to disruptions, community self-reliance is dependent on strong community networks and social cohesion (Faulkner et al., 2018). The ability to establish community self-reliance can occur from the top-down and the bottom-up, and/or autonomously among actors, with system restructuring happening explicitly among those directly affected to protect the community during times of acute or chronic crises (Worstell & Green, 2017). Community food systems can be locally organized and/or locally owned, but more importantly, a long-term and self-reflective ability to “periodically transform” strengthens community self-reliance in its contribution to social dimensions of resilience (Worstell & Green, 2017, p. 37). In food systems, an example of community self-reliance is the interdependent relationship between food consumers and producers, as farmers produce food with the understanding that community members are seeking nutritious, locally grown food, and consumers are concerned with supporting those farms as a way to contribute to the local economy (Duncan et al., 2018).

Finally, self-reliance is determined by the community’s ability to prepare for contingencies and establish access to resources. Developing and accumulating reserves, physical infrastructure, sufficient redundancies, and “diversity of complementary enterprises” (Worstell & Green, 2017, p. 37) further enhance community self-reliance.

Distributive and democratic leadership

A resilient food system is “independent yet tightly connected to other communities, markets, and government policy systems” (Worstell & Green, 2017, p. 37). Therefore, resilient systems of leadership tend to be distributive and democratic, utilizing local and/or decentralized governance (Walsh-Dilley et al., 2016). While resiliency is enhanced by an “institutional framework with equitable rights, entitlements, and decision-making processes” (Tendall et al., 2015, p. 20), formal leadership has been thought to be less important in establishing community resiliency (Faulkner et al., 2018), in which regular turnover and mandatory retirement of leadership positions promote innovation (Worstell & Green, 2017). In fact, the concept of leadership can be a precarious aspect of resiliency due to its potential to cause distrust, or “legitimately block or undermine certain trajectories of change” (Bousquet et al., 2016, p. 9). Thus, leadership should emerge from the community rather than outside sources (Faulkner et al., 2018). Assessing the power dynamics of SES is rooted in the community’s ability to question “representation, authority, and accountability” (Walsh-Dilley et al., 2016, p. 6), regularly innovating while simultaneously conserving “the tried-and-true qualities that built it” (Worstell & Green, 2017, p. 37).

Focus on the farmer and food maker

A resilient food system has the capacity to buffer against individual or family-based crises experienced by food producers. Investments in human capital through contribution to education and skill-building, as well as through social supports for farmers and farm families, are a commitment to sustaining a resilient food system and strengthening the adaptive capacity of the stakeholders within the system (Cabell & Oelofse, 2012). These invest-

ments include efforts—such as deploying a skilled network of community members to step in to manage farm operations if necessary (Worstell & Green, 2017)—to support farmers when they experience their own personal crises and disturbances. Sufficient human or social capital is an integral part of what makes a food system resilient, and supports farmers in their primary role of producing food (Tendall et al., 2015).

Food justice

Establishing food justice as part of a resilient food system encourages challenging the status quo to compel a focus on equity, to foster active contributions from historically marginalized populations, and to align with other forms of social activism (Gottlieb & Joshi, 2010). Actions to support food justice include enforcement of livable farm worker wages and centering of female and non-white farmers, as indicators of progressivism (Ludden et al., 2018). The COVID-19 pandemic highlighted existing inequities among food producers and food system workers by impacting market channels, job security, and safety in the workplace. The pandemic also enhanced the need for mutual aid to meet the nutritional needs of consumers in response to exacerbated economic disparities among food and agricultural stakeholders, illuminating where injustice weakened SES resilience (Sanderson Bellamy et al., 2021).

Power is central to assessing how food justice and food sovereignty—the ways in which “people have the right to define their own food and agricultural systems in culturally and ecologically appropriate ways” (Walsh-Dilley et al., 2016, p. 3)—contribute to resilience in SES and require questioning “representation, authority, and accountability” in social ecological governance (Walsh-Dilley et al., 2016, p. 6). In addition, understanding historical power structures that have contributed to contemporary outcomes is critical to adequately evaluating the ways that current power structures contribute to or weaken resilience. Due to social and economic inequities, not everyone in the food system is equipped to pursue their own resilient livelihoods, but with access to various forms of capital, resilient livelihoods may be achieved. Promoting community food justice is intertwined with per-

petuating self-reliance, given that food justice paradigms frequently grapple with the question of whose responsibility it is to support agricultural producers and provide access to healthful food. The expectation that resources beget resilience has been thought to perpetuate lack of larger governmental support for marginalized communities, all too often expected to advocate on their own behalf rather than receive the support they need through a resilient system that centers their needs (Walsh-Dilley et al., 2016).

Place-based economics

Similar to community self-reliance, place-based economics contributes to resilience by focusing on the local capacity of the system (Faulkner et al., 2018). Resilience is strengthened by the social cohesion and dedication to the local economy and the success of local systems (Faulkner et al., 2018). Indicators of place-based economics are designed to reflect the scale of the system, where the number of indicators needs to be implementable in order to allow for adequate comparisons across communities (Ludden et al., 2018). Integrated place-based food networks lead to entrepreneurship and innovations, and consequently to social, economic, and ecological resilience. Further, a focus on the locality or regionality of food hubs, and associated market opportunities, can support food systems resilience, especially with respect to institutional purchases across operation scales (Duncan et al., 2018).

Community Food System Resilience Indicators and Frameworks

A number of resilience frameworks have been developed to assess food and agriculture systems. The New Natural Resource Economy, an economic development framework, was used in Oregon to assess the resiliency of regional food systems in the state to make policy recommendations at the local, regional, and federal levels. Findings indicated a need for mandatory funds to improve capacity among small farms (Duncan et al., 2018). Duncan et al. also concluded that current evaluation and measurement tools at the regional, state, and local food system levels are “expensive and complex” (2018, p. 5), but those processes play

a significant role in assessing food systems resilience.

Cabell and Oelofse (2012) developed a behavior-based indicator framework to assess agroecosystem resilience. The framework is intended to enable communities to identify existing vulnerabilities within the SES and to assess where action can be taken to strengthen resilience. Indicators were developed based on SES resilience theory, spanning social, economic, and environmental categories, and were subsequently applied to an agricultural, or food system, context. While the framework was developed to consider systems greater than the individual, it also ensured that individual voices can be heard (Cabell & Oelofse, 2012).

Ludden et al. (2018) developed the Progressive Agriculture Index using indicators from existing data sets across more than 2,900 U.S. counties. These indicators included, for example the percentages of female or non-white principal farm operators, the average wages of farm workers, and the number of farms using direct-sale methods per 10,000 residents, to measure how an agricultural system impacts social, economic, and environmental conditions (Ludden et al., 2018).

Some studies have sought to determine which qualities contribute to and are most important in determining resilience in specific locales (Faulkner et al., 2018; Worstell & Green, 2017). These studies support the notion that indicators of specified resilience are community-contingent, and that concepts within community and food systems resilience frameworks are beginning to merge. For example, the sustainability/resilience index used case studies in Tennessee, Arkansas, and Mississippi to assess the common qualities of resilient self-organized food systems in the U.S. South (Worstell & Green, 2017). Worstell and Green (2017) developed the acronym *CLARDIET* to describe the characteristics of a resilient food system, highlighting eight concepts of resiliency: Connected, Local, Accumulates reserves, Redundancy, Diversity, Innovation, Ecological integration, and Transforms itself. They further described how each indicator can be achieved, through federal policy, regional networks, communities, groups of farms, farm families, and individuals.

Methods

The purpose of this study was to develop, based on expert consensus, an indicator framework—in the form of a community food system resilience audit tool—that can be used by community stakeholders to assess their community’s current level of resilience and identify opportunities for improvement. The tool was developed to highlight the above-discussed themes in food systems resilience: agricultural and ecological sustainability, community health, community self-reliance, distributive and democratic leadership, focus on the farmer and food maker, food justice, and place-based economics.

We conducted a three-phased Delphi study (Hsu & Sanford, 2007) from June through October 2021 to identify expert consensus on the core indicators to assess community food systems resilience. We chose the Delphi technique because it provides a means for “structured anonymous communication between individuals who hold expertise on a certain topic with a goal of arriving at a consensus in the areas of policy, practice, or organizational decision making” (Birdsall, 2004; Brady, 2015, p. 1). The panel assembled for this study included a purposive sample of 15 experts. Purposive sampling identifies the group members from whom the practitioner can learn the most and is based on a set of specific criteria (Dooley, 2007). We invited 41 experts to participate based on their expertise and contributions to food systems resilience. The invited panelists had professional foci and expertise related to small, medium-size, and large farms, and to food systems and public health, rural sociology, and local food marketing. While Delphi studies differ in the number of panelists they engage, a panel with 10–15 similar panelists has been recommended as the ideal number (Delbecq et al., 1975). The panelists represented a breadth of organizations, including nonprofits and universities in the U.S. and Canada, with representation from urban and rural areas and from minority and under-served populations.

Delphi Panel

A working group for the community food system resilience audit tool was assembled by North American Food Systems Network (NAFSN) and

included researchers from several academic institutions, including both land-grant and non-land-grant universities, and representation from non-profits and community-based organizations. The purposive sample for the Delphi panel included the original working group members and was bolstered by nationally recognized independent scholars, authors, food systems advocates, and members from other U.S. and Canadian universities, including the following:

Universities

- First Nations Technical Institute (an Indigenous-run higher education institution)
- Indiana University, Center for Rural Engagement
- Iowa State University
- Johns Hopkins University, Center for a Livable Future
- Kwantlen Polytechnic University, Institute for Sustainable Food Systems
- Lakehead University
- Middlebury University
- Ohio State University, Initiative for Food and Agricultural Transformation (InFACT)
- University of Florida, Institute of Food and Agricultural Science
- University of Virginia, Institute for Environmental Negotiation

Nonprofits

- American Farmland Trust
- Cultivate Charlottesville (Charlottesville, Virginia)
- Florida Food Policy Council
- Lyson Center for Civic Agriculture and Food Systems, a project of the Center for Transformative Action, a nonprofit affiliate of Cornell University
- McIntosh Sustainable Environment and Economic Development (S.E.E.D.) (Darien, Georgia)

Data Collection and Analysis

Although various formats exist, the majority of Delphi studies adhere to three structured rounds, starting with open-ended questions that advance

towards more structured questions in subsequent rounds “in order to verify previous consensus, test prepositions, and finalize decision-making models” (Brady, 2015, p. 3). Our study modified this standard format, as the items that were presented to the panel in the first round were developed by the above-mentioned working group of food systems experts, who worked independently and collaboratively over the course of 18 months to identify policies, programs, and initiatives that are salient indicators of resilience. The large working group contained subgroups focused on developing indicators based on group members’ areas of academic expertise or practical experience.

The initial indicators were developed and discussed by the subgroups, and then discussed, ranked, and revised by the whole working group. After multiple rounds of revisions, the working group identified six core values which support and animate efforts to improve community food systems resilience and that should be used to guide community food systems resilience policy and program adoption. The panelists were asked to rate the importance on a Likert scale (1=Not at all important to 5=Very important) of values that inform efforts to improve community food systems resilience. These values can be understood as the foundational goals or motivations of food systems approaches to community development. The initial six values that the working group identified were: community health, community self-reliance, distributive and democratic leadership, focus on the farmer and food maker, food justice, and place-based economics.

The working group identified 38 benefits of adopting these policies and programs. These perceived benefits serve as the reasons for adopting these policies—they provide the justification for pursuing policies to improve food systems resilience by highlighting the outcomes or impacts that can be expected. In practical terms, these perceived benefits can be derived from implementing the policies included in the community food system audit tool in the Appendix. While any specific benefit would likely only be achieved in connection with a specific policy—for example, the benefit of maintaining productive and sustainable use of farmland would only follow from adopting policy

that supports maintenance—these benefits can be understood as the suite of benefits that could be realized by adopting a range of policies to support community food systems resilience. In keeping with the overall purpose of this study, identifying the potential benefits of policy adoption can help to justify local governments devoting time and resources to policy development and adoption. The expert panel was also asked to rate their level of agreement on the potential benefits of implementing policies to support food systems resilience (1=Strongly disagree to 5=Strongly agree).

Finally, the working group identified 109 indicators of community food systems resilience, such as the presence of specific policies, programs, and initiatives that could be adopted or enacted by local governments. Thirty-six are primary indicators and 73 are sub-indicators. The sub-indicators can be thought of as policies, programs, and practices that can be implemented as a means to achieving primary indicators. For example, a primary indicator is “Jurisdiction takes steps to keep food and agricultural waste out of landfills and demonstrates commitment to recycling/reusing food and agricultural waste.” In the initial round of review, this primary indicator had four sub-indicators: agricultural composting, residential composting, food rescue, and gleaning.

The indicators of community food systems resilience were organized into seven core themes, which align with, but are not equivalent to, the six values the expert panel identified, based on their knowledge and experience of how such policies have been used effectively at the community level, that are important to guiding community food systems development. The seven core themes for policies and programs were:

1. **Agricultural and ecological sustainability**—Conservation of natural resources in local agriculture and ecosystems.
2. **Community health**—Access to nutritious, affordable, and culturally appropriate foods.
3. **Community self-reliance**—Protecting against instability of and external threats to the food supply chain.
4. **Distributive and democratic leadership**—Providing broad access to leadership

and decision-making authority among all stakeholder groups in a community, including those that have been historically marginalized.

5. **Focus on the farmer and food maker**—Protecting farmland and including concerns of farmers and processors in planning decisions, and providing financial resources toward local food system development.
6. **Food justice**—Improving food access to all segments of the population and bringing an end to the structural inequalities that lead to unequal health outcomes.
7. **Place-based economics**—Enhancing local control and ownership of food system resources and influencing the development of relevant infrastructure.

In the first round, expert panelists were presented with the six core values, 38 benefits, and 109 indicators that had been developed by the working group using a 5-point scale (1=Not at all important to 5=Very important, and 1=Strongly disagree to 5=Strongly agree). We used an a priori definition of consensus as two-thirds of the expert panel selecting a 4 or 5 (Important or Very important, Agree or Strongly agree) for a value, benefit, or indicator to be retained in the study.

The first round of review occurred between June and July 2021. Unique to this round, in addition to answering the Likert-scale questions, participants could suggest new values, benefits, and indicators. They were also given the opportunity to make comments and propose revisions to existing values, benefits, and indicators. In each section of the Delphi instrument—values, benefits, and each of the seven indicator groups—there was an open response box provided for the panel to suggest new items or propose revisions to items in the section. Items that did not meet the two-thirds threshold were deleted. Two members of the research team independently reviewed the open responses. Each reviewer developed their own wording for new items and revisions to existing items to account for cases when more than one panelist suggested additions or revisions. The two researchers compared their analyses of the proposed additions and revisions. In cases of disagreement, the

researchers reviewed the comments from other sections of the study to see whether proposed changes had already been accounted for. For example, some panelists suggested adding items related to justice and equity early in their review of indicators (e.g., in the section on community self-reliance), but those indicators were already present later in the food justice category. Since there were two more opportunities for the panel to provide feedback on the items, the researchers were inclusive in adding new proposed items that were not already included elsewhere. In most categories, some items were revised, new items added, and some were deleted. These changes are discussed in more detail in the results section.

Twelve respondents completed round two of the study between August and September 2021. We used the second round to refine the list as it had been revised and added to from the panel's feedback to the initial set of indicators provided in round one. The panelists again indicated their level of agreement on the importance of each item using a 5-point Likert-type scale of importance. In this round, panelists could no longer suggest new indicators, but they could provide general comments. Fifteen indicators were eliminated.

Ten respondents completed round three of the survey in October 2021, in which they again rank-

ing the remaining items using the 5-point Likert-type scale. Another twelve items were removed. We used the results from this round to develop the final community food system resilience audit tool. This research was approved by University of Florida Institutional Review Board (IRB #202101143).

Results

The total number of core values after round one held constant at 10 for the remaining rounds. The perceived benefits of community food systems policies were whittled down each round, from 38 to 20. The community food system indicator list ended with 96 indicators. Only one category maintained the same indicators throughout: the five place-based economic indicators. For the categories of agricultural and ecological sustainability, community health, and community self-reliance, there were both additions and deletions after round one, with continued attrition in the subsequent rounds yielding final tallies of indicators that were just slightly below the total number of initial indicators. Only one category, distributive and democratic leadership, had a final tally of indicators (11) that was higher than the initial list (9), and the indicators in that category held constant from after the first round to the end. Table 1 gives an overview of

Table 1. Summary of Indicators by Category and Round

Category	Number of indicators after			
	Initial	Round 1	Round 2	Round 3
Core values	6	10	10	10
Perceived benefits	38	30 [+7] [-15]	25	20
Agricultural and ecological sustainability	23	22 [+2] [-3]	21	18
Community health	13	14 [+2] [-1]	14	12
Community self-reliance	14	14 [+6] [-6]	12	11
Distributive and democratic leadership	9	11	11	11
Focus on the farmer	17	17 [+1] [-1]	15	14
Food justice	28	30	25	25
Place-based economics	5	5	5	5
Total	153	153	138	126

the numbers of indicators by round of review. For round one, the only round in which there were additions, we have noted in brackets the number of indicators added and those deleted to yield the total in that category, such as the addition of 7 and the removal of 15 perceived benefits in round one to yield a net reduction of 8 benefits from the 38 on the initial list.

Core Values

The expert panel's ranking of the values underpinning policies to support community food systems resilience yielded a final total of 10. As stated above, to be retained all items needed to be rated as important or very important (4 or 5) by at least

two-thirds of the panelists; the mean score for each item is in parenthesis, with 5 the highest possible score. Table 2 gives the 10 values, listed in descending order by the panel's mean score.

Perceived Benefits of Policies to Support Community Food System Resilience

The expert panel reached consensus on 20 core benefits of implementing policies to support community food systems resilience. To be included, at least two-thirds of respondents needed to agree or strongly agree (rate as 4 or 5) that it was a benefit; the mean score is included for each item, with 5 the highest possible score. The final list of perceived benefits and mean scores is in Table 3.

Table 2. Core Values Guiding Community Food Systems Policies and Programs

Topic	Mean Score
Agricultural and ecological sustainability Promotes conservation and wise use of natural resources in local agriculture and supports ecological integrity by stewarding and protecting thriving ecosystems	4.8
Community health Improves community residents' wellness through education and enhanced access to nutritious, affordable, and culturally appropriate foods	4.8
Place-based economics Enhances local control and ownership of food system resources	4.7
Human Infrastructure Having a population equipped with the knowledge, skills, practices, tools and other equipment, relationships, and other food system components that enable production of food in the local ecosystem and cultural context, and enhances capacity for realizing other values	4.6
Food sovereignty Supports self-determination of BIPOC peoples in regenerating and stewarding their chosen foodways	4.5
Focus on the farmer and food maker Builds and strengthens local family farms and food-based businesses by adopting agriculture-friendly policies and championing market access and diversification strategies	4.4
Community self-reliance Protects community members against instability of and external threats to food supply chain	4.3
Distributive and democratic leadership Provides broad access to leadership and decision-making authority among all stakeholder groups in a community, including those that have been historically marginalized, and institutional transparency to build trusting relationships	4.3
Food justice Regards access to nutritious food as a human right and seeks both to improve food access for all segments of the population and bring an end to the structural inequalities that lead to unequal health outcomes	4.3
Racial justice Incorporating and operationalizing Justice, Equity, Diversity, and Inclusion (JEDI) principles in the food system	4.1

Indicators of Food Systems Resilience

All the indicators in the audit tool were subject to the same rating criteria for inclusion—two-thirds of the expert panelists viewed them as important or very important. We ended with 35 primary indicators and 61 sub-indicators, which was a net reduction in one primary indicator and 12 sub-indicators. These results indicated robust consensus regarding primary indicators, with less support for the importance of specific means to achieve those goals.

It is important to note that while the remaining sub-indicators were supported by expert consensus, there are a number of

additional policies, programs, and initiatives—beyond those included in the community food system resilience audit tool—that if adopted could also potentially foster development of the 35 primary indicators. Therefore, this list of sub-indicators should not be regarded as comprehensive, but rather broadly suggestive of the types of policies, programs, and initiatives that could be adopted by community stakeholders to bolster the resilience of their local food system, depending on the specific local conditions. An overview of the primary indicators that correspond to the seven core themes is provided below, while the full list of the indicators and

Table 3. Perceived Benefits of Adopting Community Food Systems Resilience Policies and Programs

Benefit	Mean Score
Supports agricultural and ecological sustainability	4.6
Has the potential to retain and expand food and farming-based livelihoods and employment opportunities.	4.5
Increases sense of community and creates social capital	4.5
Accumulates productive infrastructure, from healthier soils to processing and storage facilities	4.4
Maintains greater stability and reduces vulnerability to food supply chain disruptions	4.3
Helps maintain productive and sustainable use of farmland	4.3
Keeps greater share of revenue recirculating in local community	4.3
Fosters community participation in decision-making processes and promotes shared leadership	4.2
Increases prospects for local job creation	4.2
Gives residents/communities the right to define and assert greater control over their own food systems	4.2
Supports culturally significant and community-valued foodways	4.2
Addresses legacy contamination and depletion of land, soil, and water resources and works to preserve and improve their condition	4.2
Creates a healthier working environment for farmers and farm workers	4.2
Protects and restores wildlife and wildlife habitat	4.1
Addresses historic disparities in human exposure to environmental contaminants and reduces exposure for all	4.1
Increases opportunities for food systems awareness and education	4.1
Creates community wealth and shared prosperity by investing in community assets and infrastructure, prompting increase in multiple forms of community capital formation	4.1
Addresses disparities in food access and quality of life among various population segments	4.0
Increases redundancy and diversity of supply chain components to reduce dependence on a single or few sources	4.0
Promotes development of realistic standard operating procedures for storing, delivering, and distributing food, and the provision of logistical support to needy residents and food businesses, especially during emergency periods	3.8

sub-indicators, with the mean score for each indicator and sub-indicator in parentheses, may be found in the Appendix.

Agricultural and Ecological Sustainability

Indicators in this section focus on promoting conservation of natural resources in local agriculture and ecosystems. Primary indicators in this theme include policies supporting water quality, animal welfare, food waste reduction, and soil conservation; policies reducing erosion, maintaining marine and wildlife habitat, and increasing carbon capture; and policies encouraging the adoption of food production and distribution practices aimed at reducing greenhouse gas emissions and fossil fuel dependence.

Community Health

Indicators in this section seek to improve wellness through enhanced access to nutritious, affordable, and culturally appropriate foods, and are further supported by indicators related to disaster and emergency management and planning. These indicators also specify that jurisdictions should monitor food system-related community health indicators as a partial measure of public health status, incorporate food availability as part of their general disaster/emergency planning responsibilities, and support greater equity and inclusivity by providing richer opportunities for collaboration and connection between local government and public health officials and communities of color on all levels: academic, professional, and grassroots. Primary indicators for this theme include policies supporting healthy food retail and procurement of local food by food banks and institutions, programs providing nutrition education and youth education, as well as fresh food access for limited-resource and limited-mobility residents.

Community Self-Reliance

Indicators of community self-reliance represent factors protecting against potentially destabilizing external threats to food supply chains, and provide opportunities for additional local food production. Primary indicators for this theme include: farmland protection strategies like development rights pro-

grams, conservation easements, and land trusts; policies to permit hunting and foraging; reducing barriers to starting new food production enterprises; implementing policies, ordinances, and zoning regulations that allow a greater variety of food production and small-scale processing within the community; affordable access to fresh water, mulch, compost, and other resources for community food growing programs; promoting increased consumption of locally produced food by households, public institutions, and commercial enterprises; and identification and utilization of land for food production across urban, suburban, and rural areas.

Distributive and Democratic Leadership

Indicators of distributive and democratic leadership are exemplified by communities providing broad access to leadership and decision-making authority among all stakeholder groups, including those that have been historically marginalized, building diverse stakeholder coalitions and networks, and building economic resilience and enhanced risk management through cooperation and partnership. Primary indicators for this theme include providing targeted education by the jurisdiction to build capacity of stakeholders in the community to become more actively engaged in the local food system; taking active steps to ensure that stakeholder groups are appropriately diverse and broadly representative of the communities they serve, based on race, ethnicity, age groups and gender; providing formal organizational support of local food system activities; and fostering the creation/growth of cooperatives, collective marketing networks, and expanded local control of food production, processing, distribution, and marketing.

Focus on the Farmer and Food Maker

Primary indicators for this theme include jurisdictions taking active measures to protect and preserve farmland for agricultural production purposes, establishing policies and programs to ensure that farmer/processor concerns are included in community and emergency planning decisions, and directing available financial resources toward local food systems development.

Food Justice

Indicators in the food justice category address access to nutritious food as a human right and seek both to improve food access for all segments of the population and bring an end to the structural inequalities that lead to unequal health outcomes. These policies acknowledge the inequities and injustice in the food system; strive to build stronger communities by responding to people's needs in all population segments; provide opportunities for Black, Indigenous, People of Color (BIPOC) farmers and food purveyors to strengthen their position within the local food supply chain and obtain better access to infrastructure and market outlets; promote and support the informal agricultural sector to enhance household and community self-sufficiency, entrepreneurship, and food sovereignty; and create mechanisms, such as local food policy councils, that ensure regular communication and mutual exchange between governmental, business, non-profit, and community-based entities. Primary indicators under this theme include jurisdictions identifying and publicly acknowledging inequities and injustice in the local food systems, developing programs and policies that provide direct support to lower-income households struggling with food insecurity, investing in BIPOC-owned and operated farms and food businesses, establishing ordinances that support household-level food production and related allowable and accessible uses, and operating local food policy councils to elevate the concerns of local food system stakeholders as a matter of public policy.

Place-based Economics

Indicators for this theme focus on ways to enhance local control and ownership of food system resources: advancing policies and programs that develop both a skilled and capable labor force that can participate successfully in the local agricultural or food sector, and relevant scale-appropriate infrastructure in support of more efficient local food processing and distribution. Primary indicators include investing in workforce training and professional development for jobs needed to sustain and expand local food supply chains and providing financial support and resource commitments toward the development of local food infrastructural assets.

Discussion

There is considerable variation in community food systems, including differences in climate, social and cultural norms, resource availability, and the degree of urbanization. Each of these dimensions creates unique challenges for developing shared values, positive outcomes of adopting community food systems policies, and identifying indicators that can be applied to all communities. Recognizing these potential obstacles, our expert panel consciously aimed to develop indicators that would be broadly applicable. In fact, some of the initial indicators identified—particularly certain sub-indicators—did not reach two-thirds consensus and were removed precisely because they failed to have broad applicability. For example, an indicator about requiring food production on university campuses was removed because the threshold number of panelists did not consider it to be applicable to most community food systems. The panelists noted that such a policy was beneficial but not what they viewed as most important in policies to support community food systems resilience. The general stability of the number of values, benefits, and indicators through the three rounds of the Delphi study highlight the expert panel consensus on the items that were eventually included in the values, benefits, and the audit tool.

We intend for the audit tool to be used by individuals and groups who are seeking to assess the resilience of their community food systems and identify goals that can improve their overall resilience. We also see this tool as useful for communities who have already identified an issue that they would like to address, such as community health, but would like guidance on specific policies and programs that could help support their goal(s). We intend for this tool to be useful to a range of audiences and communities. We anticipate it being most useful for local governments, food policy councils, and cooperative extension agents who work to support food systems and community health.

A research opportunity following from this project is to pilot test the use of the audit tool. The pilot test could focus on its use by different groups—including local governments, cooperative extension, food policy councils and others—as well

as communities ranging from urban to suburban to rural. The pilot test may identify opportunities to modify the audit tool to improve its practical applicability. An additional research opportunity would be to utilize the tool in conjunction with other sorts of community food systems assessments, such as asset mapping, to yield a potentially richer picture of the overall status of the resilience of community food systems. Indeed, while jurisdictions having policies and programs in place is an important factor in food systems resilience, there are often activities undertaken by community groups, cooperative extension, health departments, and economic development councils that also play important roles in the overall resilience of community food systems. Finally, conducting a longitudinal study that includes baseline and follow-up assessments of social and ecological indicators in the community following the implementation of policies and programs recommended by the audit tool involving areas such as food security, community nutrition, and soil and water quality, would be helpful in measuring the efficacy of the audit tool.

Limitations

Conducting a study that utilizes an expert panel yields results that are rooted in the quality of the assembled panel, and thus is beneficial to the extent that the perceptions of experts are sufficient to address the research question (Dooley, 2007). In the case of this study, while the members of our panel collectively brought both depth and breadth of expertise across the range of topics addressed in the tool, and represented small, medium-size, and large farms and various dimensions of food systems such as food access, equity, public health, and economic and community development, it is still the case that the audit tool was developed based on the selected group of panelists and not by assessing the outcomes of the adoption or implementation of policies.

While there is an inherent risk of excluding minority or historically marginalized viewpoints when doing a study based on expert consensus, our team sought to ensure that we had BIPOC representation on the expert panel. We also sought to ensure that we had representation not only from academic research experts on topics, but also

nationally recognized leaders from nonprofits and community organizations who have practical experience working on community food systems policy advocacy, development, and implementation.

For the final round of the study, we only received participation from 10 members of the 15 original members of the expert panel. While 10 is an acceptable number of expert panelists for a Delphi study, the research team had hoped to have greater participation in the final round. However, the consistency of responses through the three rounds—following the year-long, iterative process of developing the initial list of indicators which preceded the three rounds of anonymous ranking—provides additional support for the validity of the audit tool, despite the more limited participation in the final round.

It is important to note that the mere existence of a policy without associated activities or support may have no practical impact; conversely, there may already be activities occurring in a community which do not have a formal policy associated with them. While a policy alone does not yield outcomes, identifying policy options to support community goals can be an important way to facilitate community engagement by providing a supportive environment for individuals and groups to work collaboratively alongside policy makers to achieve shared goals.

Finally, this study relies on assimilating existing views on improving community food systems; it does not present novel ideas about challenging the dominant perspectives on progressive food systems. However, while there is a need for novel ideas that challenge the status quo, the purpose of this study was to create a tool to align current viewpoints on resilience and to translate them into a useable tool for practitioners to conduct food systems assessments.

Conclusion


In the wake of the COVID-19 pandemic and increasing prevalence of natural disasters, awareness of the importance of community food systems resilience has become a part of public consciousness. Furthermore, with increasing awareness of the systemic injustices in our community food systems and their impacts on health disparities, it has

become clear that it is necessary to adopt policies to support food systems resilience that take into account both general *and* specific resilience so that the support of one goal does not reinforce inequality or reduce resilience in another part of the food system. The results of this Delphi study provide a comprehensive framework to address community food systems resilience to address the seven core themes we have identified that contribute to community food systems resilience: agricultural and ecological sustainability, community health, community self-reliance, distributive and democratic leadership, focus on the farmer and food maker, food justice, and place-based economics.

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Appendix: Community Food System Resilience Audit Tool

Indicators of Community Food System Resilience

Please mark whether these indicators are present in the community.

Theme 1: Agricultural and Ecological Sustainability

Promoting conservation of natural resources in local agriculture and ecosystem

- ☐ Jurisdiction adopts policies to support water quality, water conservation, watershed management. (4.7)
- ☐ Jurisdiction encourages the adoption of practices to address animal welfare. (4.3)
- ☐ Jurisdiction takes steps to keep food and agricultural waste out of landfills and demonstrates commitment to recycling and reusing food and agricultural waste. (4.1)

If so, has the jurisdiction enacted the following initiatives?

- ☐ Agricultural composting (4.0)
- ☐ Residential composting (3.8)

Soil conservation measures

- ☐ Jurisdiction encourages the adoption of soil health-promoting and conservation practices in agriculture. (4.7)

If so, does the jurisdiction encourage the following?

- ☐ Cover crop use (3.9)
- ☐ Crop diversification (4.1)
- ☐ Crop rotation (4.2)
- ☐ Use of windbreaks (3.8)

- ☐ Jurisdiction encourages preservation of natural land resources to reduce soil and land erosion, maintain marine and wildlife habitat, and increase carbon capture. (4.6)

If so, does the jurisdiction do the following?

- ☐ Preserves coastal wetlands (e.g., salt marshes, seagrasses, mangrove forests) to create a buffer against floodwaters and maintain carbon sequestration. (4.3)
- ☐ Preserves and creates vegetative buffer zones in riparian areas, using native trees, shrubs, grasses and plants, to reduce erosion and maintain water quality and wildlife habitat. (4.6)
- ☐ Facilitates the adoption of agroforestry practices, which integrates management of forested lands with livestock and crop production, improves soil health, reduces soil erosion and increases carbon capture. (4.5)

- ☐ Jurisdiction encourages the adoption of food production and distribution practices aimed at reducing greenhouse gas emissions and fossil fuel dependence. (4.4)

If so, has the jurisdiction enacted the following policies?

- ☐ Promotes use of renewable energy sources and/or electric vehicles in food transport and logistics. (4.2)
- ☐ Restricts types of fertilizers that may be used on commercial farms. (4.1)
- ☐ Restricts types of fertilizers that may be used on public or residential properties. (4.3)

Theme 2: Community Health

Improves citizen wellness through enhanced access to nutritious, affordable and culturally appropriate foods

- ☐ Jurisdiction supports equity and inclusivity by providing opportunities for collaboration and connecting with communities of color on all levels: academic, community, professionals, and grassroots organizers. (4.2)
- ☐ Jurisdiction monitors public health indicators as a measure of food system-related community health. (4.2)
- ☐ Jurisdiction has one or more farm-to-institution procurement programs (school, day care, hospital, prison). (4.2)
- ☐ Jurisdiction has policies promoting healthy food retail. (4.4)
- ☐ Jurisdiction provides fresh food access for limited-resource and limited-mobility residents (e.g., via mobile farmers market, fresh produce delivery van, etc.). (4.1)
- ☐ Community-based nutrition education and youth education programming is available in jurisdiction. (4.3)
- ☐ Jurisdiction encourages food bank(s) to source fresh food from local farms. (4.2)

Disaster and emergency management and planning

- ☐ Jurisdiction incorporates and prioritizes food availability and access issues as part of its general disaster and emergency planning responsibilities. (4.1)

If so, has the jurisdiction done the following?

- ☐ Emergency and disaster plans are integrated and coordinated with other emergency relief and food access activities slated to take place in the jurisdiction and broader region. (3.9)
- ☐ Emergency provisions include specific acquisition and storage recommendations for household members, food retailers, public agencies, and relevant nonprofit organizations. (3.8)
- ☐ Information about disaster and emergency plans, the conditions that trigger their adoption and their expected impact is regularly and widely shared with local government officials, non-governmental stakeholders, and members of the public. (3.8)
- ☐ Disaster and emergency management planning is informed by feedback solicited from as wide a range of local stakeholders as possible to reduce the chances of overlooking critical information. Stakeholder engagement is facilitated by meeting people where they are, through public meetings, interviews, and outreach activities. (3.8)

Theme 3: Community Self-Reliance

Protects community members against instability of and external threats to food supply chain

- ☐ Jurisdiction actively supports farmland protection strategies like development rights programs, conservation easements, and land trusts, among others. (4.7)
- ☐ Jurisdiction adopts policies to allow hunting and foraging. (4.1)
- ☐ Jurisdiction takes steps to reduce barriers to starting new food production enterprises. (4.6)
- ☐ Jurisdiction adopts policies, ordinances, or zoning regulations to allow food production, the cottage food industry, and small-scale processing within the community. (4.8)
- ☐ Jurisdiction actively supports affordable access to fresh water, mulch, compost, and other resources for community food growing programs. (4.5)
- ☐ Do the producers in your community produce food for local consumption? This includes personal household consumption, food service use, commercial sale, and donations to food insecure residents, produced within the boundaries of the jurisdiction.

If so, has the jurisdiction done the following?

- ☐ Community produces food on privately operated commercial farms (over \$1,000 in annual sales volumes). (3.9)

Opportunities for additional local food production in the jurisdiction

- ☐ Does the jurisdiction have property that has the potential to be used for additional food production? This includes food production by local growers and ranchers for local consumer markets.

If so, does the jurisdiction take on opportunities for additional local food production in the following ways?

- ☐ Unplanted, arable land is available in the jurisdiction that could be used by current farmers for additional food production. (4.0)
- ☐ Unplanted, arable land is available in the jurisdiction that could be used by Community land bank programs give new or beginning farmers for additional food production. (4.5)
- ☐ Jurisdiction actively supports soil remediation measures and construction of raised beds to enable food production in contaminated locations. (4.0)

Theme 4: Distributive and Democratic Leadership

Provides broad access to leadership and decision-making authority among all stakeholder groups in a community, including those that have been historically marginalized

- ☐ Jurisdiction provides education to build capacity of stakeholders in the community to become leaders, champions, ambassadors, or otherwise become more actively engaged in the local food system by fostering links with mentors and leadership training opportunities. (4.5)
- ☐ Jurisdiction actively involves a broad range of stakeholders including individuals from all races, ethnicities, age groups, and gender identities. (4.3)

Building diverse stakeholder coalitions and networks

- ☐ Jurisdiction provides formal organizational support of local food system activities. (4.5)

If so, has the jurisdiction enacted the following initiatives?

- ☐ Operates a food policy council devoted to creating and/or promoting a more resilient local food system through information exchange, networking, identification of priority needs, and program development and implementation. (4.4)
- ☐ The food policy council strives for its membership to be demographically representative of the jurisdiction's population. (4.5)
- ☐ The food policy council observes protocols for maximizing transparency (such as advertising open public meetings, and issuing and archiving public minutes). (4.3)
- ☐ Local industry representatives provide mentoring guidance to new business entrants on food business development and operations. (3.7)

Builds economic resilience and enhances risk management through cooperation and partnership

- ☐ Jurisdiction fosters the creation and growth of cooperatives, collective marketing networks and expanded local control of food production, processing, distribution, and marketing. (4.4)

If so, has the jurisdiction enacted the following initiatives?

- ☐ Jurisdiction fosters the creation and/or growth of formal agricultural cooperatives that sell local food to local markets. (4.2)
- ☐ Jurisdiction fosters the creation or growth of marketing networks (other than formal cooperatives) that enable multiple producers to share equipment, packing, distribution, and/or transportation expenses involved in supplying locally produced food to local markets. (4.4)
- ☐ Jurisdiction fosters the creation and/or growth of cooperatively owned food retail venues that showcase locally grown foods, promote socially responsible practices in the food supply chain, and provide economic benefits to members. (4.4)

Theme 5: Focus on the Farmer and Food Maker

Protects and preserves farmland

- ☐ Jurisdiction takes active measures to protect and preserve farmland for agricultural production purposes. (4.5)

If so, has the jurisdiction enacted the following initiatives?

- ☐ Agricultural overlay zones have been established that preserve agricultural land from increased residential or commercial development, and/or identify specific permitted, accessory, and conditional agricultural uses. (4.5)
- ☐ Administers programs that actively match new or beginning farmers with farmland available for lease or purchase. (4.4)
- ☐ The jurisdiction works closely with and supports cooperative extension to provide for the critical needs of farmers and food-makers. (3.8)

- ☐ Jurisdiction has policies or programs to ensure that farmer and processor concerns are included in community and emergency planning decisions.

If so, has the jurisdiction enacted the following initiatives?

- ☐ Jurisdiction operates an agricultural advisory board, composed primarily of farm representatives, that provide guidance to local government on policy decisions. (4.1)
- ☐ Local industry representatives (current or retired) provide formal mentoring guidance to new business entrants on food business development and operations. (4.1)
- ☐ Jurisdiction offers food business accelerator or food technology programs that provide an economical mechanism for testing the feasibility of value-added food products for the retail market without requiring substantial upfront capital investment. (4.2)

- ☐ Jurisdiction directs available financial resources toward local food system development.

If so, has the jurisdiction enacted the following initiatives?

- ☐ Entities in the jurisdiction administer a grant program or low-interest loan fund that provides affordable capital to small and beginning agricultural enterprises. (4.2)
- ☐ Stakeholders from local governmental or nonprofit organizations collaborate with local food supply chain actors to secure targeted grant funding from State or Federal agencies. (4.1)
- ☐ Stakeholders from local governmental or nonprofit organizations within the jurisdiction collaborate with local food supply chain actors to secure targeted grant funding from private foundations or mission-driven financial institutions. (4.1)
- ☐ Community Development Financial Institutions (CDFIs) in the jurisdiction provide funding to local food system initiatives, either with the help of financial assistance awards offered by the Healthy Food Financing Initiative or other means. (4.1)
- ☐ Private agricultural lending institutions, such as members of the Farm Credit Council, provide financial support to local food producer or processors in the jurisdiction. (3.8)

Theme 6: Food Justice

Acknowledgement of the inequities and injustice in the food system

- ☐ Does the jurisdiction identify and publicly acknowledge existing inequities and injustice in the local food system?

If so, does the jurisdiction participate in the practices below?

- ☐ Jurisdiction uses information obtained during public listening sessions to plan and implement corrective steps related to inequities in the food system. (4.1)
- ☐ Jurisdiction connects people from historically disadvantaged backgrounds with resources in their community. (4.1)

- Jurisdiction seeks input from historically marginalized farmers to ensure that their needs and preferences are included in policies and activities. (4.5)
- Jurisdiction supports land back and land reparations for BIPOC farmers. (4.1)

Building stronger communities by responding to people's needs in all population segments

- ☐ Do the programs and policies in the jurisdiction provide direct support to lower-income households struggling with food insecurity?

If so, has the jurisdiction enacted the following initiatives?

- Public or nonprofit entities within the jurisdiction conduct programs that coordinate the provision of healthful, fresh food to food-insecure households. (4.4)
- Nonprofit or public agencies within the jurisdiction have either adopted incentives or relaxed procurement rules to encourage a greater share of food purchases from local sources. (4.5)

Provides opportunities for BIPOC farmers and food purveyors to strengthen their position within the local food supply chain and obtain better access to infrastructure and market outlets

- ☐ Does the jurisdiction invest in BIPOC-owned and operated farms or food businesses?

If so, does the jurisdiction participate in the following practices?

- Invests in BIPOC-owned and operated farms and food businesses through direct grants or low interest loan funds. (4.5)
- Targets the reduction of the BIPOC unemployment rate (especially among youth) as an explicit policy goal by identifying potential job opportunities within the local food system. (4.2)
- Invests in training for aspiring BIPOC farmers and food producers. (4.3)
- Helps secure targeted grant funding from State or Federal agencies that supports the development of BIPOC-owned and operated farms or food businesses by identifying funding opportunities and/or providing grant writing resources. (4.3)
- Helps secure targeted grant funding from private foundations or mission-driven financial institutions that supports the development of BIPOC-owned and operated farms or food businesses by identifying funding opportunities and/or providing grant writing resources. (4.4)
- Facilitates lending to BIPOC-owned and operated farms and food businesses by public lending institutions (such as the U.S. Department of Agriculture Farm Service Agency). (4.2)
- Facilitates lending to BIPOC-owned and operated farms and food businesses by private agricultural lending institutions, such as members of the Farm Credit Council. (4.3)

Jurisdiction promotes and supports the informal agricultural sector to enhance household and community self-sufficiency, entrepreneurship, and food sovereignty

- ☐ Zoning, licensing, and permitting ordinances support household-level food production and related allowable and accessible uses.

If so, does the jurisdiction allow the following?

- ☐ Backyard poultry (4.1)
- ☐ Farm stands (4.2)
- ☐ Household composting (4.1)
- ☐ Vegetable gardens in lieu of lawns (4.4)
- ☐ Community land bank programs give residents a formal voice and input in determining neighborhood land use (often with the help of community advisory boards composed of local residents) (4.4)

Jurisdiction provides formal organizational support of local food system activities

- ☐ Jurisdiction operates a local food policy council to elevate the concerns of local food system stakeholders. (4.3)

If so, does the food policy council do the following?

- ☐ Local food policy council creates and promotes a more resilient local food system through information exchange, networking, identification of priority needs, and program development and implementation. (4.6)
- ☐ The food policy council strives to make its membership demographically representative of the jurisdiction's population. (4.6)

Theme 7: Place-Based Economics

Takes steps to develop skilled and capable labor force that can participate successfully in the local agricultural or food sector

- ☐ Jurisdiction invests in workforce training and professional development for jobs needed to sustain the local food system. (4.4)

If so, has the jurisdiction enacted the following initiative?

- ☐ Stakeholders from local jurisdiction pursue educational credits and/or certificates in local food leadership curricula or similar professional credentials aligned with the labor and skill requirements of local food systems (offered by many land-grant institutions online or in person). (4.0)

Develops relevant infrastructure in support for local food distribution

- ☐ Jurisdiction provides financial support and/or resource commitments towards the development of local food infrastructural assets. (4.2)

If so, has the jurisdiction enacted the following initiatives?

- ☐ Support for local food distribution infrastructure (e.g., food hubs and aggregation sites, shared warehouses and cold storage facilities). (4.3)
- ☐ Support for local food packing and processing infrastructure (e.g., shared-use kitchens, co-packing operations, permanent and mobile meat and poultry slaughter facilities). (4.2)

Planning toward sustainable food systems: An exploratory assessment of local U.S. food system plans

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Abstract

National planning and health organizations agree that to achieve healthy and sustainable food systems, planners must balance goals across a spectrum of sustainability issues that include economic

vitality, public health, ecological sustainability, social equity, and cultural diversity. This research is an assessment of government-adopted food system plans in the U.S. that examines which topics, across the three dimensions of sustainability (social, environmental, and economic), are included in local food system plans and conducts an exploratory analysis that asks whether the community capitals (built, cultural, social, financial, human, and natural) available in a community are associated with the content of food system plans. The research team first developed a Sustainable Food System

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Policy Index made up of 26 policy areas across the three dimensions that, in aggregate, define and operationalize sustainable food systems. With this index we evaluated a sample of 28 food system plans for inclusion of these policy impact areas. We then performed an exploratory regression analysis to examine whether the availability of community capitals was associated with the content of food system plans. Findings indicated that jurisdictions integrated a broad range of issues into their food system plans; however, there are certain issues across every dimension of sustainability that are much less frequently included in plans, such as strategies related to participation in decision-making, financial infrastructure, and the stewardship of natural resources. Regression analysis identified statistically significant linear relationships between particular capitals and the proportion of policy areas included in plans. In particular, higher metrics associated with poverty were associated with the inclusion of fewer policy areas and with a potentially narrower policy agenda. This study adds to the plan evaluation literature as one of the first attempts to document the content of a sample of U.S. food system plans through a sustainability lens, contributing to the knowledge of what types of issues are advanced by local food system plans and the policy implications of current gaps in planning agendas.

Keywords

Food System Evaluation, Food System Plans, Food Policy, Food Security, Urban Planning, Regional Planning, Sustainability

Introduction

Current forms of food production and distribution fail to deliver what is expected or needed to ensure their contribution to full societal wellbeing. The negative impact of the modern food system on Earth's limited resources has been recognized internationally as "one of the most important drivers of environmental pressures, especially habitat change, climate change, fish depletion, water use and toxic emissions" (Hertwich, 2010, p. 2). The shortcomings of the globalized food system have additionally generated escalating rates of obesity and diet-related chronic disease worldwide (Ritchie & Roser, 2017). The crop inputs for much of these

calorically rich but nutritionally deficient diets are fueling ongoing consolidation across agricultural sectors (MacDonald et al., 2018). This vertical and horizontal integration of commodity markets restricts access to farm inputs (seeds, fertilizer) and processing infrastructure, making it more difficult for small and medium-size farms to operate independently, resulting in even more concentration of wealth. Collectively, the health effects resulting from the abundance of cheap, unhealthy foods, the economic effects (as in the shift from secure livelihoods in small food businesses to low-wage food system jobs with few benefits), and environmental degradation from industrial food production and processing practices are causing a well-documented decline in quality of life (American Public Health Association, 2007).

Through the combined efforts of advocates, institutions, and researchers with those of community members and practitioners, the local food movement has pervaded public awareness and entered the public policy agenda. Food systems planning attempts to shape "more sustainable, just, equitable, self-reliant, and resilient community and regional food systems for present and future generations. ... [It] emphasizes, strengthens and makes visible the interdependent and inseparable relationships between individual sectors from production to waste management ... [while] leveraging connections to other health, social, economic and environmental issues" (American Planning Association, 2007). Pothukuchi and Kaufman (1999) were among the first to advocate for the formal integration of food systems into the planning field: "food is very much an urban issue, affecting the local economy, the environment, public health, and quality of neighborhoods. ... Responses to food system issues need to be bolstered by planning and policy initiatives at regional, national, and even global levels" (p. 217). In 2007, the American Planning Association (APA), which represents urban and rural planning practitioners, released its first policy guide for community and regional food planning, recommending balancing the needs for an "efficient food system with the goals of economic vitality, public health, ecological sustainability, social equity, and cultural diversity," thus creating an imperative for the profession (APA, 2007).

Also in 2007, the American Public Health Association (APHA) emphasized the relationship between a number of interrelated food system themes in a position paper encouraging the APHA to promote more sustainable, healthier, and more equitable food systems (APHA, 2007). Alignment between planning and health organizations culminated in the 2010 APA position statement “Principles of a Healthy, Sustainable Food System,” which asserted that a healthy, sustainable food system “emphasizes, strengthens, and makes visible the interdependent and inseparable relationships between individual sectors (from production to waste disposal) and characteristics (health-promoting, sustainable, resilient, diverse, fair, economically balanced, and transparent) of the system” (APA, n.d.). A broad body of literature has developed since then that traces the evolution of planning inquiry into food systems research (Brinkley, 2013), details the work and makeup of the groups engaged (Bassarab et al., 2019; DiGiulio, 2017), and interrogates the competing discourses around food system objectives (Candel & Pereira, 2017; Moschitz, 2018). Although far from being a standard practice, many local governments are beginning to include food in planning practice. Governments, from the city to the region scale, are transforming food systems structurally through changing land use codes or incorporating food into existing government comprehensive plans, sustainability plans, and standalone food system plans (Neuner et al., 2011). The call for coordinated food system policy is growing across industries and interdisciplinary groups (Mande et al., 2020).

Haysom et al. (2020) argue that although “there are a number of options open to local governments [for institutionalizing food systems planning], one of the most strategic and transversal approaches is through planning and urban design” (p. iv). Despite the role of food in city planning for the local economy, the environment, public health, and quality of neighborhoods (Pothukuchi & Kaufman, 1999), urban planners are rarely the first to launch food systems policies and plans (Hoey, in press; Mui et al., 2018). A more common scenario is that urban planners are brought into the food planning fold as targets of policy entrepreneurs coming mainly from public health departments and

coalitions of scholar-activists and grassroots groups (Hoey, in press; Mui et al., 2018). Local governments seldom have a department of food, and few jurisdictions can dedicate a full-time staff member to the subject even when this blind spot has been identified (Harper et al., 2009). Consequently, much local food policy work at the substate level is undertaken by food policy councils, which often exist outside formal government or as a hodgepodge of local agencies that try to coordinate (Bassarab et al., 2019). By convening stakeholders from across the food system (e.g., farmers, grocers, food processors, educators, government, consumers) and across sectors (e.g., health, planning, transportation, nonprofit, community, for-profit, government actors) to define and organize around food system goals, food policy councils act as a “voice for system-wide changes in governance for food policy and planning ... and facilitators in the networking and implementation capacity of other organizations” (Schiff, 2008, p. 216). The groundwork laid by these councils (e.g., conducting local food assessments and developing collective policy priorities through engagement with community stakeholders) is often incorporated into official government plans. There were 282 councils in 2018 in the U.S., up from fewer than 25 councils in 2000 and 125 in 2010 (Bassarab et al., 2019).

However, if a food strategy is made more comprehensive by the diversity of disciplines and stakeholders informing it, it is also challenged by the diversity of definitions, values, and goals that these actors bring along with them. M. C. Campbell (2004) maps the various tensions and conflicts that exist between food system stakeholders; some tensions are based on differences in scale, fundamental values, and positions of power, while others are a function of actors with compatible interests failing to develop a common language and agenda. Each actor has their specific ways of thinking, speaking, and acting. They also bring with them their own interests, which may or may not be stated explicitly in interactions between actors but may underlie decision-making (Moragues-Faus et al., 2013).

Ultimately, whose views are reflected in a food policy agenda is influenced by a number of factors: funding and political and public support are potent

forces, in addition to who is sitting at the decision-making table (Bassarab et al., 2019). Food policy councils often work with limited or no formal authority, and without the funding that comes with formal structures or frameworks (DiGiulio, 2017); some are disbanded after not being able to manage this (Coplen & Cuneo, 2015). In turn, food system agendas are highly malleable, bending to the current political and funding climate (Santo & Moragues-Faus, 2019). Institutionalized food policy councils are not spared from these forces. Government-embedded food policy councils appear to have the same problems with lack of funding and staff as those structured as nonprofits or grassroots organizations (DiGiulio, 2017).

The type of assessment tool used to gather information about a local food system will influence the food agenda as well. Freedgood et al. (2011) detail a number of community-based assessments (e.g., foodshed, comprehensive food system, asset mapping, land inventory, food deserts, food industry) used in conjunction with stakeholder participation to develop a vision and an actionable plan for local food systems. Besides its specific purpose, each has its own limitations, which affect the intended solutions.

Based on a number of case studies of food system policy development in the U.S. and other countries, Hoey (in press) reflects that including food in local government tends to be gradual, characterized by small, incremental wins with rare windows of opportunity that allow more dramatic leaps forward. With dogged persistence, individuals or groups inside or outside government pursue varying “entry points” into food systems planning. Examples of their strategies include molding policy champions across sectors who put their time, effort, and reputations into moving an idea forward, growing a broad base of support, codifying a focus on food in policies (like zoning or procurement), and using strategic framing to appeal to people’s interests.

How food is incorporated into planning takes a number of pathways. Over the last ten years, it has become much more common for communities to integrate food system elements into comprehensive and master plans, sustainability plans, healthy community plans, and sector-specific plans (urban

agriculture or food access), and to adopt related stand-alone policies such as zoning changes (Cabannes & Marocchino, 2018; Hodgson, 2012; Hodgson & Moreau, 2019; Neuner et al., 2011; Robert & Mullinix, 2018). The development of stand-alone food system plans is much less common (Neuner et al., 2011) but is a growing trend.

According to Wayne Roberts, a Canadian advocate and leader in the development of food policy, “when situations truly ripen for food policy, it is expressed as a strategy not a (stand-alone) policy, for the simple reason that a policy without a strategy is a wish list without a plan” (Roberts, 2016, p. 196). While individual policies can be highly influential on the food system, as when zoning is amended to allow for agricultural uses and the construction of small structures that do not require a permit or engineer approval, stand-alone food system plans address a more comprehensive set of food system issues and components than individual policies can. Food system plans also tend to include issues that other plans may leave out, such as topics related to food waste reduction and management (Robert & Mullinix, 2018; von Massow et al., 2019), food and farm labor, local food aggregation and processing infrastructure (Clark et al., 2021), and food distribution and transportation (Mui et al., 2018). These plans are also more likely to represent broad coalitions of support across the food system that are important for enacting sustainable food systems and practices (Hoey, in press). The food-specific focus of these plans is well suited for the investigation of issues included in the food system agenda in the framework of the three dimensions of sustainability: environment, society, and economy.

Despite the increasing use of food system plans in driving sound policies, regulations, and investment to improve the food environment, there is little empirical evidence regarding the topical scope of goals and policies in food system plans. This study investigates which issues food system plans are addressing in pursuit of healthier, sustainable food systems and tests the null hypothesis: plans address each of the three dimensions of sustainability with an equal proportion of policy areas. While we recognize that a food system plan may not represent every initiative or focus area that the

stakeholders in a community are already or intend to address, this document serves as a reflection of what topics have gained support on a government level and are outwardly acknowledged as important issues for a community.

Research has shown a relationship between levels of community capitals¹ (built, financial, human, social, cultural, natural) and community outcomes. Schmit et al. (2020) develop a comprehensive set of indicators associated with stocks of community-based wealth at the county level and use these indicators to evaluate a specific community outcome: the percentage of farms selling through direct-to-consumer channels in both metro and nonmetro counties. Their results demonstrate clear differences in the association of capital stocks and the percentage of farms' direct-to-consumer channel adoption, suggesting that the success of food system interventions, policies, and strategies for local economic development may hinge on the preexisting levels of community capitals and/or the need for planners to develop them further. In another study, Fey et al. (2008) compare 57 communities to determine the impact of different investments across community capitals and learn from their successes. They identify a host of actions and investments that set the most successful communities apart from lower-outcome

communities. Unlike the less successful communities, higher-outcome communities employed a number of strategies that targeted the development of social and human capital through strategies like encouraging new partners to actively participate in economic development efforts and encouraging the emergence of new community leadership. These findings led us to ask whether the resources available in a community can influence the content of food system plans, and so we have conducted an exploratory analysis, testing the null hypothesis of no association between the existence of community capitals and the proportion of policy elements included in food system plans.

In summary, we described a simple evaluative tool that measures the inclusion of a set of characteristics that are known from the literature to be important to the food system and that span the three dimensions of sustainability. We then used this tool to evaluate the breadth of policy impact areas in a sample of U.S. food system plans, assess whether plans address each of the three dimensions of sustainability with an equal proportion of policy areas, and test for associations that exist between plan scales and policy inclusion as well as associations between the breadth of policy impact areas and community capitals. We addressed four basic questions:

¹ According to the concept of community capitals, which emerges from the discipline of rural sociology, there are things beyond monetary wealth (financial capital) that matter for the wellbeing of a community. These include the stock of trust, relationships, and networks that support civil society (social capital) (Pender & Ratner, 2014), stocks of physical or produced capital, including outputs of firms, public agencies, and durable goods used in production and consumption (built capital) (Pender & Ratner, 2014), stock of education, skills, and physical and mental health (human capital) (Pender & Ratner, 2014), stock of practices that reflect the values and identities rooted in place, class, and/or ethnicity (cultural) (Pender & Ratner, 2014), and the stock of natural resources that yields a flow of goods and services into the future (natural capital) (Costanza & Daly, 1992). Although the value of place is expanded in this conceptualization, some argue that this view still defines people, land, and resources as capital, working within the limitation of the larger macroeconomy; therefore, because this view is tied to people and nature as assets (a concept related to ownership and dominance), it is a framework ultimately limited in its ability to drive sustainability. Economists McGregor and Pouw (2016) argue that to address problems of human wellbeing in the globalizing and rapidly changing world, it is first necessary to understand "the economy" as an instituted process of resource allocation (as opposed to a simple place of exchange). Understanding the economy as a social construction is the departure point for adopting an expanded conception of the person that is fundamentally different from the individualistic and reductionist notion of "rational economic agent." To truly measure progress in wellbeing, McGregor and Pouw offer a multidimensional concept of human wellbeing: the relationship between the wellbeing of the person and the collective. Kimmerer's (2020) nonacademic exploration of the gift economy is a good complement to McGregor and Pouw. In her essay, Kimmerer describes the gift economy of indigenous communities as built on the foundation of cooperation. In the gift economy, the world and everything in it—a sweet berry, a pheasant successfully hunted, or clean water—are gifts, not objects to be possessed. The currency of exchange in a gift economy is made up of gratitude, relationships, and reciprocity. These exchanges in turn build community relationships, networks, and trust (social capital), strengthen cultural identity (cultural capital), and improve the quality of natural habitats for many species (natural capital). Kimmerer suggests that by shifting from a worldview based in scarcity (that drives competition and results in exploitation of resources and labor) to one of abundance, collective wellbeing can be greatly improved.

- Which topics, across the three dimensions of sustainability, are included in food system plans?
- Are social, environmental, or economic policy areas included at equal frequencies in plans?
- Is there an association between plan scale (city, county, region) and the policy impact areas included in plans?
- Is there a relationship between greater inclusion of policy areas in plans and documented levels of community-based capitals (human, cultural, economic, built, financial, natural)?

Methods

For the first phase of research, the research team focused on identifying a sample of comprehensive U.S. food system plans and the criteria for selecting plans for further analysis. We then developed a sustainability policy area index using a grounded approach to group topics into categories across the dimensions of sustainability. We used this index deductively to evaluate the inclusion of topics in the plans (Chun Tie et al., 2019).

Food System Plan Selection

We used the elements for conducting a systemic literature review described by Xiao and Watson (2019) to identify food system plans. Initially, we performed a search with two key terms, “food system plan” and “food action plan,” using Google Scholar and the Google general search engine, and thoroughly reviewed results until no new plans could be identified. A personal account was utilized for this step, which may have resulted in biased searches influenced by Google’s paid algorithms. We therefore performed additional searches in October 2021 using DuckDuckGo, a nontracking search engine, for the terms “food charter,” “food system vision,” and “food system roadmap” to ensure that plans by these names were not overlooked. The research team supplemented this search by seeking out peer-reviewed articles with the same terms, searching backwards and forwards, examining the grey literature, and soliciting feedback via the Johns Hopkins national food policy email list. We then used twofold criteria to finalize a sample of plans for analysis.

First, we were interested in local plans, including city, county, and regional plans, that had been formally adopted by a government body. Adoption was assumed to have taken place when the primary party responsible for constructing the plan was a government entity and a resolution of adoption was included in the plan document itself. If nothing within the document referred to adoption, we contacted a local official or organizer involved in the development of the plan to verify its status. We assumed that adoption represented a commitment of resources to the public policy issues included in the plan. The formalization of strategies into a public policy is an indication of political willingness to assign staff, funding, and time to the effort. The likelihood of implementing an adopted plan may therefore be greater than that of one that is not adopted. However, adoption is just one proxy for investment in the food system agenda; others include the work groups and individuals inside and outside government who organize around food, farm, and health issues. Our study does not attempt to identify every place where food system planning is happening, nor did it document a comprehensive set of priorities and actions undertaken in any given locality. What it does provide is an accounting of the topics that local and regional governments are addressing in formally adopted food system plans, representing the most comprehensive food system-focused document have developed.

The second criterion was that in order to be considered to be comprehensive, plans had to focus on a systemic range of issues within a locality and address a full range of activities and processes that represent a food system. By this criterion, plans that were narrowly focused on a single issue (e.g., obesity or community engagement) and plans that proposed only consumption- or production-side interventions were excluded. A plan also had to be a stand-alone document and not a component of a larger plan (e.g., part of a master or sustainability plan). Single-component and issue-based plans have narrower agendas by nature and necessarily focus their attention on particular issues. In an earlier review of the inclusion of the food system into U.S. plans and policies, Nuener et al. (2011) differentiate between stand-alone comprehensive food system plans and those focused on a

particular component of the food system (such as production, processing, distribution, consumption, or disposal), but they did not define what makes plans comprehensive. Food system definitions vary in the number of components they individually distinguish (e.g., the retail component of the food system may be specifically called out, or food distribution and consumption are referenced without the retail intermediary that connects them). Eames-Sheavly et al. (2011) define a food system as the collaborative network of actors and activities across seven components: food production, processing, distribution, marketing, retail, consumption, and waste recovery. Applying this definition, we judged that plans addressing a majority (at least four of the seven) of these food system components covered an adequately broad range of activities across the food system.

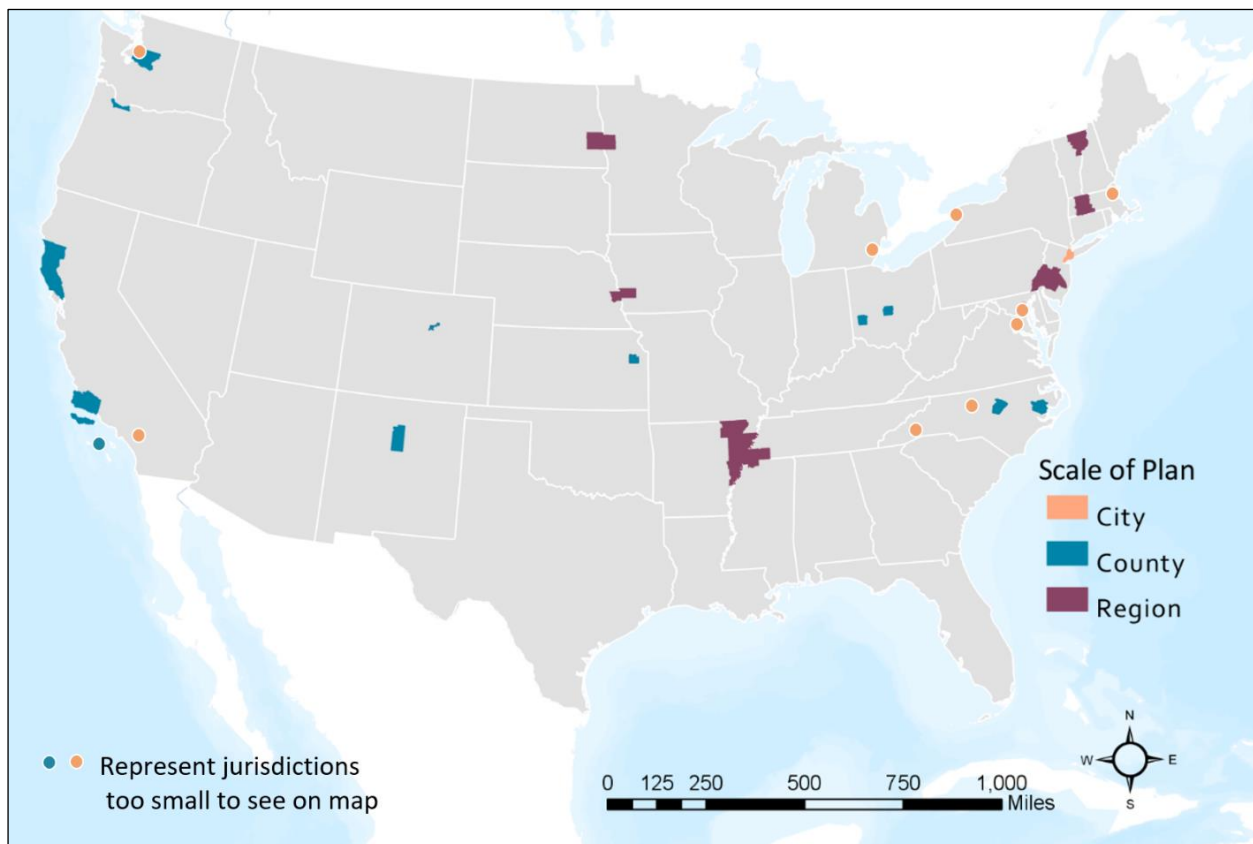
The 28 plans that met both criteria (Table 1) originate from across the continental U.S. (Figure

1) and were adopted between 2008 and 2019. In this sample are 9 city, 13 county, and 6 regional plans. Plans adopted by a city and county were categorized as a county plan, representing the total jurisdictional area affected by the plan. These 28 plans represent all food system plans in the U.S. adopted by December 2019 using the search strategy described above, except one. A single city-scale plan, Growing Food Equity in New York City, was missed in the first plan search in 2019 but would have met the study criteria. We have included it in Appendix A, which inventories the full list of sub-state-level comprehensive U.S. food system plans that were identified through October 2021.

Identifying policy impact areas for food system sustainability

The three-dimensional model of sustainability conceptualizes sustainability as the overlap between the social (or equity), environmental, and eco-

Figure 1. Map of Jurisdictions from which the Food System Plans (N=28) in this Data Set Originate, Distinguished by Scale (City, County, Region)



nomie. The dimensions overlap, emphasizing that the many issues facing the planet are interlocking crises and pointing to the need for active cooperation and participation from all sectors of society to

manage interwoven dependencies (World Commission on Environment and Development, 1987). We used this model as a framework to guide the development of the evaluation tool.

Table 1. Selected U.S. Food System Plans (N=28)

Scale	Jurisdiction(s)	Plan Name	Year Published
Region	City of Fargo, and Cass, North Dakota (ND), and Clay, Minnesota (MN), counties	Metropolitan Food Systems Plan	2013
Region	Delaware Valley Region: 9 counties across New Jersey (NJ) and Pennsylvania (PA)	Eating Here: Greater Philadelphia's Food System Plan	2011
Region	Douglass and Sarpy, Nebraska (NE), and Pottawattamie, Iowa (IA), counties	Healthy Food for All: A Community Food Security Plan	2018
Region	Mid-South Region: 15 counties across Arkansas (AR), Mississippi (MS), and Tennessee (TN)	Delta Roots: The Mid-South Regional Food System Plan	2015
Region	Northeast Kingdom: Caledonia, Essex, and Orleans counties, Vermont (VT)	Regional Food System Plan for Vermont's Northeast Kingdom	2016
Region	Pioneer Valley, Franklin, Hampshire, and Hampden counties, Massachusetts (MA)	Pioneer Valley Food Security Plan	2014
County	Arlington, Virginia (VA)	Recommendations for a Food Action Plan	2013
County	Beaufort County, North Carolina (NC)	Healthy, Fresh, Local Food: An Action Plan for Increasing Availability and Access	2013
County	City and County of Denver, Colorado (CO)	Denver Food Vision	2018
County	City of Columbus and Franklin County, Ohio (OH)	Local Food Action Plan	2014
County	Douglas, Kansas (KS)	Douglas County, Kansas, Food System Plan	2017
County	King, Washington (WA)	Local Food Initiative	2015
County	Mendocino, California (CA)	Mendocino County Food Action Plan	2014
County	Montgomery, OH	Food Equity Plan	2019
County	Multnomah, Oregon (OR)	Multnomah Food Action Plan	2010
County	Santa Barbara, CA	Santa Barbara County Food Action Plan	2016
County	City and County of Santa Fe, New Mexico (NM)	Planning for Santa Fe's Food Future	2014
County	Sonoma, CA	Sonoma County Healthy and Sustainable Food Action Plan	2012
County	Wake, WA	Moving Beyond Hunger	2017
City	Asheville, NC	City of Asheville Food Policy Goals and Action Plan	2017
City	Baltimore, Maryland (MD)	Baltimore Food System Resilience Advisory Report	2017
City	Detroit, Michigan (MI)	A City of Detroit Policy on Food Security	2008
City	Greensboro, NC	Greensboro Fresh Food Access Plan	2015
City	Niagara Falls, New York (NY)	Niagara Falls Food Action Plan	2018
City	New York, NY	FoodWorks: A Vision to Improve NYC	2010
City	Riverside, CA	Food Policy Action Plan	2015
City	Seattle, WA	Seattle Food Action Plan	2012
City	Somerville, WA	Somerville Food Plan	2019

Prior to evaluating plans for topic inclusion, the research team developed a Sustainable Food System Policy Index of policy impact areas across the three dimensions of sustainability that in aggregate define and operationalize sustainable food systems. The schematic of the methods detailing the development of this tool and its use in the research is depicted in Figure 2. As a first step, we reviewed literature from various fields, including public health, agriculture and natural sciences, sustainability, urban and regional planning, and rural sociology, to identify topics related to the social, environmental, and economic dimensions of food systems. We then grouped recurring topics into thematic categories from which we derived 26 final policy areas. Next, we classified plan elements (goals, objectives, and strategies) according to these categories based on their policy intent. For each policy area, we defined an objective. During the process of iterative coding and index revision, we used negative case analysis (Shenton, 2004) to refine typolo-

gies by revisiting the data to confirm that chosen policy areas did account for all instances of the topics. The inclusion of 26 policy impact areas was then assessed across the environmental, social, and economic dimensions in the plans (Table 2). The 26 areas cumulatively represent a complete set of topics considered requisite to a sustainable food system based on literature and current practices. The first author completed the coding with input from other authors into classification and the criteria used to inform interpretation of plan elements.

Resulting data were binary, as we assigned a 0 or 1 to each plan for each of the 26 policy areas. We applied three criteria to assess whether a proposed action or strategy addressed each of the 26 policy areas: (1) only the explicit effects of a goal or action were considered; (2) only the direct effects of a strategy, based on the review of literature, were considered; and (3) terms and descriptions used in the plan were used to contextualize and understand the plan element being scored. An example application of these criteria is provided in Figure 3.

We documented all instances of inclusion of each of the 26 identified policy impact areas in each plan. Higher percentage rates indicate the presence of a greater number of policy impact areas included in the plan and of a broader policy agenda.

Statistical Analysis

The research team conducted statistical analyses using Minitab. We performed one-way analysis of variance with Turkey's pairwise comparisons to test the null hypothesis: plans address each of the three dimensions of sustainability with an equal proportion of policy areas. Two-way analysis of variance was used to test the null hypothesis of no association between plan scale (city, county and regional) and percentage of policy impact areas included.

We also performed an exploratory linear regression analysis to test for linear associations between community capitals and completeness in food system plans. The community capital categories used are based on Schmit et al. (2020): built, cultural, financial,

Figure 2. Schematic of Methods

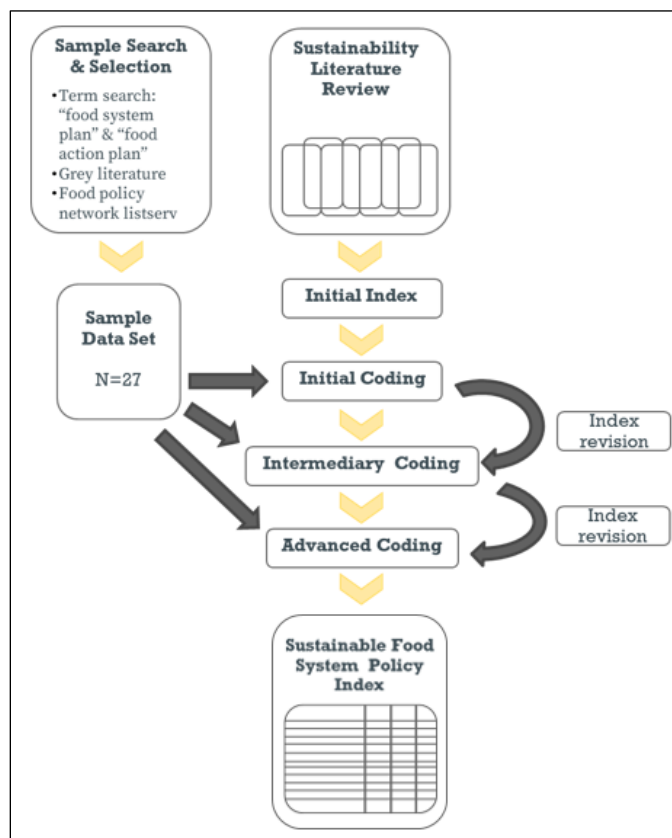


Table 2. Sustainable Food System Policy Index

Policy Impact area		Objectives
Social dimension		The objective of these strategies is to...
1	Food Access	improve access, availability, and affordability of local, healthy, affordable food options
2	Food Waste Rescue & Redistribution	increase the amount of rescued and redistributed food that would otherwise be wasted
3	Food Knowledge & Education	increase consumer knowledge of healthy foods, preparation, processing, growing practices, and the food system
4	Food Safety & Nutrition	increase the safety and nutrition of the food supply and food environments
5	Celebration of Culture & Diversity	celebrate the culture, identity, and heritage of the local and regional food system and support opportunities to better reflect its diversity (e.g., agrotourism, marketplaces that highlight diversity of local food cultures, entrepreneurship support and other programs targeted at historically excluded groups such as Black, Brown, Indigenous People of Color)
6	Participation in Decision-Making	create pathways for engagement and empower actors from across the food system and across sectors to actively participate in decision-making and program implementation
7	Equity for Producers and Food System Workers	support the wellbeing of food system workers (e.g., farmers, laborers, retail, and processing workers) through measures which impact economic, mental, and physical health and address existing inequalities (e.g., 3rd party certification programs for producers, provisions of 401k, support of food co-operatives, improved housing, etc.)
8	Equity Outside the Food System	support social equity outside the food system, including in housing, transportation, and healthcare (e.g., develop policies and programs to reduce poverty)
9	Access to Natural Capital & Built Capital	encourage consumers to grow, process and sell their own food by helping them access natural capital and built capital and enabling sale of their products (e.g., access to water, land bank properties for community gardens, local seed and tool libraries, regulations to permit sale from home gardens)
10	Coordination & Collaboration (Soc)	increase coordination and social capital, and augment the impact of collective efforts in social policy areas (e.g., gardening programs to connect seniors and youth)
Environmental dimension		The objective of these strategies is to....
11	Water	conserve water resources, increase efficiency of water use, and protect water bodies from pollution (e.g., restore critical water bodies and protective buffer zones, improve efficiency of irrigation water)
12	Energy & Air	maintain or improve air quality, increase efficiency of energy use, reduce total use, and develop alternative sustainable energy sources (e.g., develop renewable energy capabilities on farms, connect producers with energy saving technology and practices)
13	Soil	conserve and restore soil health (e.g., encourage land use practices that reduce erosion)
14	Plants	sustainably manage populations and grow biodiversity (e.g., provide pollinator habitats, encourage diversity in production)
15	Animals	sustainably manage populations and grow biodiversity (e.g., elimination of nontherapeutic use of antibiotics and growth hormones in the food supply, protect pollinators)
16	Land Conservation & Stewardship	preserve undeveloped land, limit development of natural landscapes (e.g., land banking of commercial properties for community gardens, preservation easements, market-based strategies to protect natural resource)
17	Food Waste Reduction & Composting	reduce the environmental impacts of food waste, including GHG emissions from transportation and landfills, and increase composting of food waste for use in soil building
18	Coordination & Collaboration (Env)	increase coordination and social capital, and augment the impact of collective efforts in environmental policy areas
Economic dimension		The objective of these strategies is to...
19	Workforce Development	support an adequate and knowledgeable food system workforce (e.g., through vocational programs, pathways to career growth, ongoing training/education)
20	New Business & Entrepreneurship	support existing and grow new food businesses, provide technical and financial assistance to food entrepreneurs, including farms, processors, and restaurants (e.g., by offering business services, creating business incubators)

continued

21	Promotion & Markets	promote the availability, quality, and value of local food to grow market demand (e.g., local food campaigns, agrotourism, local food directory) and expand opportunities for the sale of local food (e.g. low-income CSA, healthy food in corner stores, institutional procurement, farmers markets)
22	Aggregation, Distribution & Processing Infrastructure	support economic viability of the food system through development of physical food system infrastructure (e.g., permanent farmers markets, food hubs, distribution networks, processing facilities and machinery)
23	Financial Infrastructure	develop and increase access to funding mechanisms and infrastructure for food system entrepreneurship (e.g., block grants, revolving funds)
24	Access to Natural Capital for Entrepreneurship	support entrepreneurs in accessing land, water, clean soil, and other resources necessary for entrepreneurship in the food system (e.g., establish urban boundaries, reduce water expenses for urban agriculture, support intergenerational land transition)
25	Food Waste for Entrepreneurship	decrease costs associated with food waste and turn waste into a resource (e.g., decrease hauling costs for businesses, recycling of food waste into compost or biofuel for sale, sale of imperfect foods that would otherwise be wasted)
26	Coordination & Collaboration (Econ)	increase coordination and social capital, and augment the impact of collective efforts in economic policy areas (e.g., interagency coordination to streamline regulations affecting farmers and food businesses, know-your-farmer field trips)

human, natural, and social. Two to three measures for each capital were selected from publicly available sources, including the U.S. Census and the National Arts Index (Table 3): Social Capital: number of nonprofit organizations (excluding those with an international approach), number of social organizations per 1,000 residents; Natural Capital: acres in farmland, proportion of land area in farms; Human Capital: total population, percentage of population (25+) with at least a bachelor's degree, rate of food insecurity; Financial Capital: owner-occupied housing rate, percentage of persons below poverty level; Built Capital: number of food and manufacturing establishments (combination of two separate measures); Cultural Capital: nonwhite population, number of libraries per 100,000 residents, number of museums per 100,000 residents. Regression was also used to test

for a linear association between the number of plan elements (the number of goals, objectives, or strategies contained in a plan) and completeness scores. City-level food insecurity data were not available, so county statistics are used as an estimate in these regressions.

Results

Topics Found in Food System Plans

Figure 4 shows the percentage of plans that addressed each policy area with at least one plan element (goal, objective, or strategy). Some topics were widely addressed across food system plans. For instance, all the plans had at least one plan element focusing on food access, food safety and nutrition, new business and entrepreneurship, and promotion and marketing. Other policy areas in

Figure 3. Example of the Plan Policy Evaluation Method

Example 1: A policy under the Farming and Sustainable Agriculture section of the Delaware Region Valley Plan states that "New Jersey and Pennsylvania should expand programs that match interested farmers with interested landowners or retiring farmers. As development pressure increases, land values increase. ... Farmers need access to less expensive land because agriculture is land-intensive, has slim margins for profitability, and is subject to extreme fluctuations in prices" (Delaware Valley Regional Planning Commission [DVRPC], 2011, p. 33). The explicit intent of this policy is to support farmers in accessing land and thus is scored under access to natural capital for entrepreneurship in the economic dimension. Simultaneously, keeping farmland from development maintains a higher ecological value for it and thus is also scored under the land conservation policy area in the environmental dimension.

Example 2: Another strategy from the Delaware Valley Region Plan is that "national and regional policy advocates should work on immigration reform to recognize the importance and needs of temporary agricultural workers" (DVRPC, 2011, p. 65). The rationale for this strategy addresses workforce needs as well as the need to weed out abuses faced by farmworkers, and therefore is scored as addressing workforce development in the economic dimension as well as equity for producers and food system workers in the social dimension.

Table 3. Linear Regression Results of Exploratory Analysis

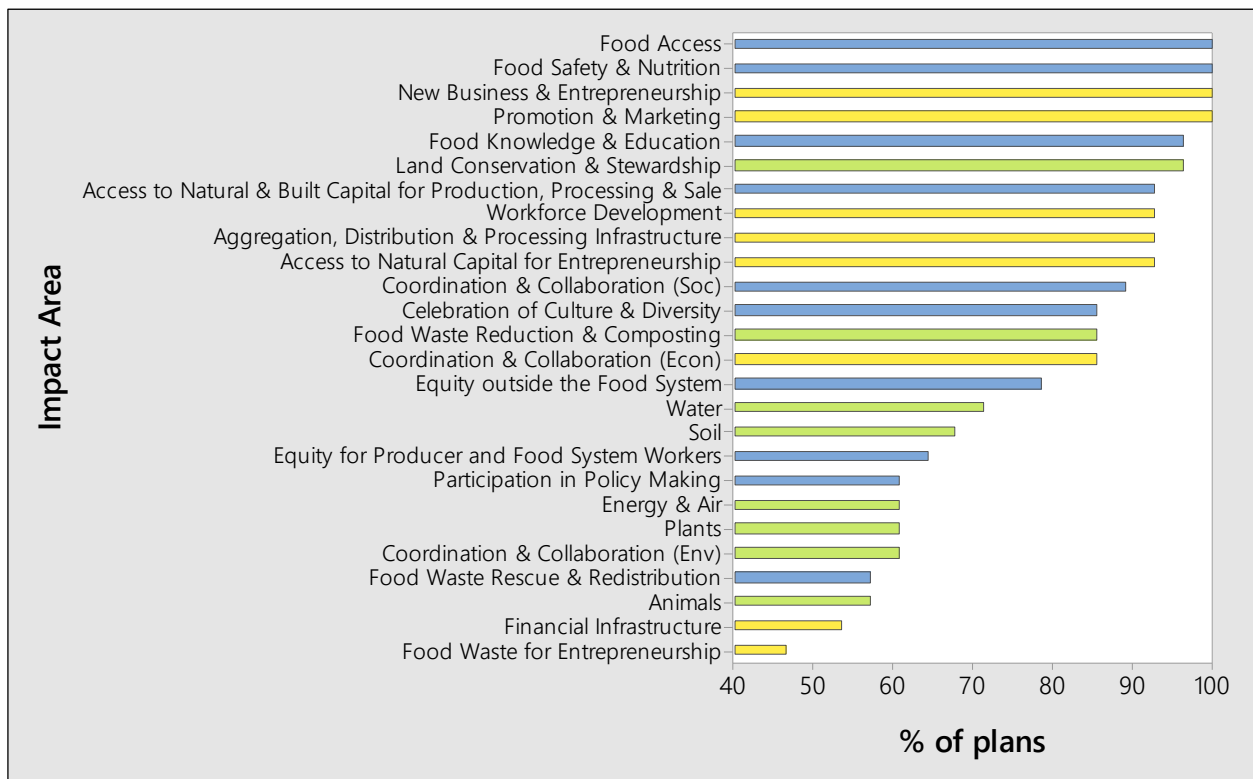
Variable	Source	Proportion of impact areas included in plan (%)				Proportion of impact areas within dimension included in plan (%)											
						Society				Environment				Economy			
		Slope co-eff.	Coeff. std error	Slope co-eff. P-value	r ² (%)	Slope co-eff.	Coeff. std error	Slope co-eff. P-value	r ² (%)	Slope co-eff.	Coeff. std error	Slope co-eff. P-value	r ² (%)	Slope co-eff.	Coeff. std error	Slope co-eff. P-value	r ² (%)
# of plan elements	This research	0.262	0.076	0.002*	31.63	0.304	0.085	0.001*	32.85	0.358	0.164	0.039*	15.41	0.113	0.087	0.203	6.14
Social Capital																	
Number of nonprofit organizations without including those with an international approach	Rupasingha et al. (2006)	0	0	0.712	0.53	0	0	0.894	0.07	0	0	0.587	1.15	0	0	0.961	0.01
# of social organizations per 1,000 residents**	Rupasingha et al. (2006)	-27.2	13.8	0.060	12.93	-26.6	16.1	0.110	9.50	-41.1.2	27.9	1.52	7.72	-14.18	14.3	0.335	3.58
Natural Capital																	
Acres in farmland	USDA NASS (2019)	0	0	0.321	3.78	0	0	0.3	4.13	0	0	0.674	0.69	0	0	0.350	3.36
Proportion of land area in farms (%)	USDA NASS (2019)	0.087	0.118	0.469	2.03	0.024	0.136	0.860	0.12	0.233	0.230	0.319	3.82	0.087	0.118	0.469	2.03
Human Capital																	
Total population	U.S. Census Bureau (2018)	0	0	0.616	0.98	0	0	0.904	0.06	0	0	0.380	2.98	0	0	0.926	0.03
% of population (25+) with at least a bachelor's degree	U.S. Census Bureau (2018)	0.226	0.208	0.287	4.34	0.366	0.231	0.126	8.78	0.227	0.414	0.588	1.14	0.050	0.2082	0.814	0.22
Rate of food insecurity (%)	Feeding America (n.d.)	-2.274	0.840	0.012*	21.97	-2.10	1.00	0.046*	14.45	-3.47	1.73	0.056	13.38	-1.291	0.899	0.163	7.35
Financial Capital																	
Owner-occupied housing rate (%)	U.S. Census Bureau (2018)	-0.004	1.67	0.981	0	-0.110	0.189	0.565	1.29	-0.009	0.326	0.979	0	0.142	0.161	0.388	2.88
% persons below poverty level	U.S. Census Bureau (2018)	-1.259	0.462	0.011*	22.23	-1.039	0.561	0.075	11.68	-2.151	0.934	0.030*	16.94	-0.640	0.498	0.210	5.97
Built Capital																	
Number of food and beverage manufacturing establishments	U.S. Census Bureau (2018)	0.011	0.015	0.457	2.15	0.007	0.017	0.694	0.60	0.031	0.028	0.273	4.61	0	0.014	0.779	0.31
Cultural Capital																	
Nonwhite population (%)	U.S. Census Bureau (2018)	-0.364	0.156	0.028*	17.26	-0.203	0.192	0.299	4.15	-0.652	0.311	0.046*	14.46	-0.277	0.106	0.095	10.36
Number of libraries per 100,000 residents	Kushner & Cooper (2019)	-0.20	0.330	0.550	1.39	-0.452	0.368	0.230	5.48	-0.277	0.649	0.673	0.70	0.192	0.324	0.558	1.33
Number of museums per 100,000 residents	Kushner & Cooper (2019)	0.314	0.284	0.280	4.47	0.010	0.331	0.976	0	0.549	0.559	0.335	3.57	0.458	0.271	0.103	9.91

Note: Slope coefficients given as "0" in the table are $-0.001 \leq$ and ≥ 0.001

Bolded values* significant at $p < 0.05$

** social organizations include religious, civic, social, business, professional, and labor organizations; golf courses and country clubs, fitness and recreational sports centers, sports teams and clubs

Figure 4. Percentage of 28 Food System Plans that Address Each of 26 Policy Areas Addressing Social (Blue), Environmental (Green), and Economic (Yellow) Dimensions of Sustainability

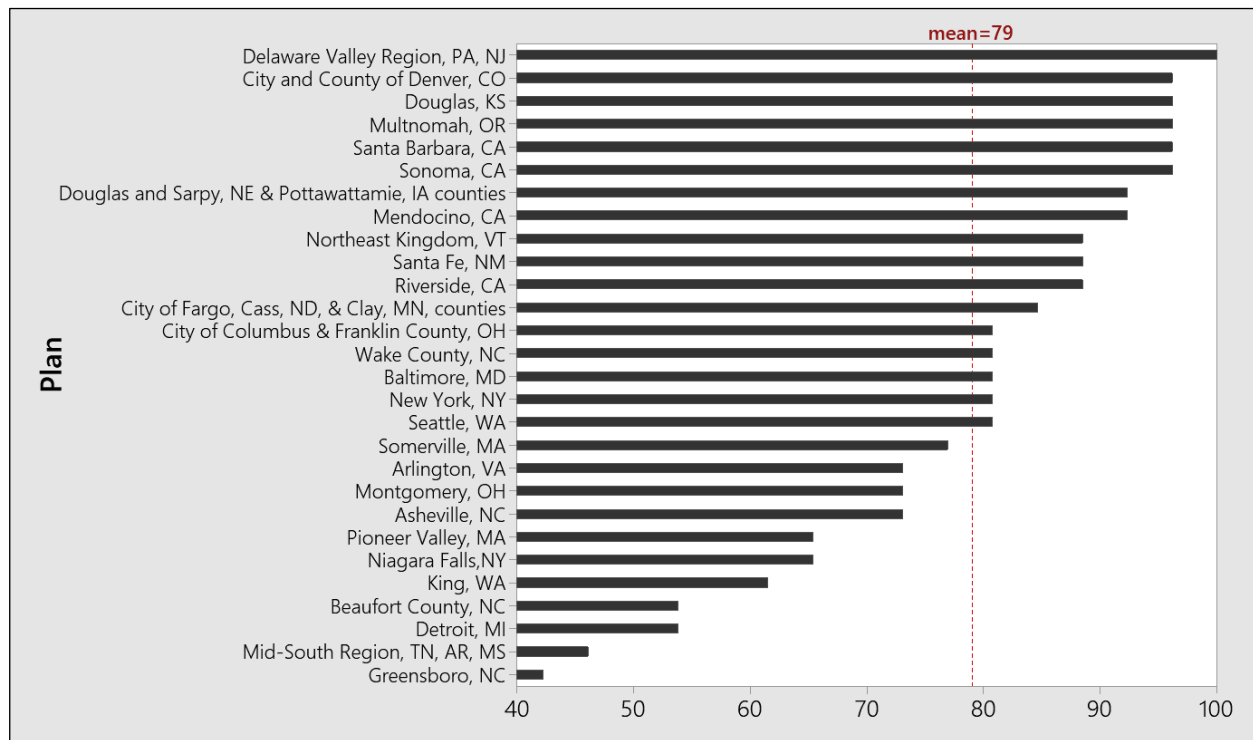


each dimension of sustainability were generally left out of plans, for example, financial infrastructure and the entrepreneurial opportunities in repurposing food waste. About half the plans (13 of 28) addressed the quality or conservation of every natural resource (water, soil, air and energy, flora and fauna, and land) with at least one plan element, although close to a third of plans (8 of 28) did not address biodiversity, water, or soil at all. Six of these 8 plans identify increasing access to healthy, affordable food as a primary goal of the plan (Beaufort County, NC; Greensboro, NC), are titled “food security plans” (Pioneer Valley, MA; Wake County, NC; Detroit, MI), or have been developed by organizations focused on food access (Somerville, MA). These plans focused on nutrition and food security but did not extend to crucial environmental components of a sustainable food system.

Food waste is discussed primarily as an environmental issue (24 of 28 plans), leaving out opportunities for the rescue and distribution of oth-

erwise wasted food, including the entrepreneurship opportunities (included in 16 and 13 of 28 plans, respectively) inherent in the social and economic dimensions of food waste. Participation in decision-making, a policy area in the social dimension of sustainability, was mentioned in 18 plans. Plans from only about half the jurisdictions (15) included a plan element aimed at developing funding mechanisms to finance food systems.

The proportion of impact areas included in plans ranged from 42–100%. The average plan included 79% of impact areas (95% CI: 72.56, 84.86) (Figure 5). In Figure 5, the 28 plans evaluated in the data set are listed on the vertical axis, and the proportion of policy impact areas addressed in the 26 plans are represented on the horizontal axis. While only one plan addressed all 26 policy areas, 11 plans included at least 88% of policy areas, reflecting three missing policy areas. The proportion of included impact areas did not vary significantly between city, county, and regional plans ($F_{2,25}=1.55, p=0.232$).

Figure 5. Percentage of Policy Impact Areas Included in Plans

Inclusion of social, environmental, and economic policy areas

The differences in inclusion between social, environmental, and economic policy areas within plans were not statistically significant, at $\alpha=0.05$ [$F_{2,81}=2.78, p=0.068$]. The proportion of environmental impact areas included in plans exhibited the widest variation across the data set, whereas the proportion of economic impact areas varied the least (Figure 6). Individual plans at the city, county, and regional scale exhibited wide variation in the inclusion of impact areas within the three dimensions. However, no significant interaction was observed between scale of plans and the proportion of impact areas within a specific dimension of sustainability [$F_{4,75}=0.31, p=0.87$], indicating that differences in the proportion of impact were independent of plan scale.

Variables associated with the inclusion of impact areas

We observed negative linear relationships between the proportion of included policy impact areas and metrics related to human, financial, and cultural capitals (Table 3). The proportion of impact areas

included in a plan were significantly negatively associated with the following local metrics (based on U.S. Census data): percentage of food-insecure households, people in poverty, and nonwhite population. The proportion of impact areas in the social dimension included in a plan were significantly negatively associated with the percentage of households experiencing food insecurity. The proportion of impact areas within the environmental dimension included in a plan were significantly negatively associated with the metrics of people in poverty and nonwhite population (Table 3).

The proportion of impact areas included in a plan was positively associated with the number of plan elements, which were classified according to which of the 26 policy areas they addressed (Table 3). The number of plan elements ranged from 10 to 106. On average, plans identify 48 goals, objectives, and strategies. Of the four plans that included the fewest topics, three have the fewest plan elements (between 10 and 18). Of the three, the Mid-South Regional Food System Plan is positioned as a strategic plan presenting a set of strategic interventions to build on existing, competitive

Figure 6. Percent of Policy Areas, in Each of Three Dimensions of Sustainability Included in Plans, Across Plan Scales

(Orange Dot=City Plan; Blue Dot=County Plan; Red Dot=Regional Plan)



strengths in growing markets. The other two plans, from Beaufort County, NC, and Greensboro, NC, are focused on improving access to healthy, fresh, local, foods, a narrower overarching goal than other plans in the data set. From this, we suggest that plans in the sample attain a similar level of impact area inclusion with varying numbers of plan elements. For example, one plan included 81% of policy impact areas with 45 plan elements, whereas four others addressed the same proportion of impact areas with 61, 77, 89, and 120 elements.

Discussion

This study evaluates the breadth of policy impact areas included in food systems plans. On average, food system plans in the U.S. cover a broad range of topics: 79% or about 20 of 26 policy impact areas that contribute to sustainable food systems. A number that cover the lowest proportion of these important sustainable food system components are focused on a specific set of issues in the food system, perhaps as a strategic choice. Social, environ-

mental, and economic policy impact areas are integrated at statistically similar levels in food system plans, with the proportion of environmental impact areas exhibiting the greatest variability. Within each dimension, certain policy areas are included more frequently than others.

In the environmental dimension, land conservation and composting appear in nearly 90% of plans; the remaining natural resource stocks—water, air and energy, soil, and flora and fauna—are addressed less consistently. Seven plans (25%) did not address the management of water, soil, or plant and animal resources at all. Considering that good agricultural practices are critical to local food production as well as environmental health and justice, the absence of planning for natural resources may indicate a limited approach to systems thinking in some plans. Expanding food system assessment tools to include investigations of the environmental impacts of current practices on soil fertility, recovery of organic materials, and soil and water quality would be a good way to start integrating environ-

mental health into food system analysis (Freedgood et al., 2011).

Plan elements in the social dimension, for participation in decision-making, equity for producers and food system workers, and food waste rescue and redistribution, are absent from 36–43% of plans. There is room for improvement, especially in creating processes for ongoing community-driven development (included in 60 % of plans). According to McKenzie (2004), widespread participation by citizens in electoral procedures and in other areas of political activity, particularly at the local level, is a key indicator of the social dimension of sustainability; a sustainable community “provides resources and support to enable disadvantaged people to participate” (p. 19). It should be noted that this research is coarse-grained on the subject of equity. There is a range of “who is being planned for” (e.g., none specified, food system workers, producers, immigrants) and “how.” Greater understanding of inclusion of equity into plans will require a more fine-grained investigation of existing inequities in a community and the strategies pursued to address them.

In the economic dimension, food waste entrepreneurship and financial infrastructure are absent in 64% and 46% of plans, respectively. All plans included elements regarding new business and entrepreneurship, and may be supporting actions within this sector without explicitly naming it. The absence of financial infrastructure elements in plans can be explained partially by the lack of awareness of how to deploy traditional financing tools to support localized food systems. Water and sewer, road, and other major forms of public infrastructure are funded through well-developed and well-known finance tools such as bonds, tax credits, and loan programs, but only recently have these same finance tools begun to be utilized to fund food system projects.

Food system plans are created at various scales and with a wide range of priorities for local concerns. Given the diversity of jurisdictions in this sample, the variation in scores in part indicated varied local priorities. Whether a plan was a city, county, or regional plan only mattered when it came to the proportion of included economic policy impact areas. Specifically, cities fell behind

counties when it came to incorporating elements related to financial infrastructure. Some researchers suggest that there is a specialization of roles between cities and counties with respect to economic development and that counties fulfill a regional coordination function for municipalities and towns and emphasize different types of economic development activity (Morgan, 2009; Reese, 1994). In addition to providing strategic regional leadership, counties employ a greater variety of economic development strategies and more nontraditional techniques than cities, with a greater tendency to collaborate and involve more organizational partners in administering their economic development programs (Morgan, 2009; Reese, 1994). As the food movement has matured, the scales and costs of projects have grown as well (Rittner et al., 2020), exacerbating the struggle food system efforts already face in accessing funds (Bassarab et al., 2019). Without additional financial infrastructure, competition for limited capital may result in the stagnation of food system development. Cities, therefore, should consider diversifying the types of economic strategies they can employ to include specific financing mechanisms for food entrepreneurs and food system infrastructure.

As part of our exploratory analysis of the relationship between availability of community capitals and percentage of policy elements included in food system plans, we observed that there is a negative relationship between food insecurity and the overall proportions of policy impact areas and social impact areas in a plan. We also observed a negative relationship between the proportion of all 26 impact areas included in a plan and higher rates of poverty and nonwhite populations. A negative relationship was also observed between the inclusion of environmental impact areas with those same two factors, with increasing rates of poverty and nonwhite population. One common-sense interpretation for these associations is that communities with higher rates of poverty may prioritize a more focused set of topics and issues rather than pursuing a broader set of social, environmental, and economic policy areas, at least within the specific context of food system plans.

Santo and Moragues-Faus (2019) have documented accounts from food system groups in the

U.K. and U.S. that perceive the predominance of funding from the public health sector as driving the focus of food initiatives toward working with chronic disease and healthy food access, while issues such as the environment, sustainable agriculture, and the needs of farmers and agricultural workers (who composed a substantial part of the original food movement) have a more tenuous role. Tighter focus may also be attributed to stronger representation of public health and anti-hunger workers or emergency responders on food policy councils, compared with individuals representing labor, food retail, social justice, economic development, or natural resources interests (Bassarab et al., 2019). Some food system plans in this sample were in fact developed by food policy councils and later adopted by local jurisdictions. In this way food policy council membership is a force that can work parallel to or independent of funding in guiding the local food system agenda. A follow-up study could revisit these plans and delve more deeply into the makeup of stakeholders and how they have influenced the topics included in plans; for example, by asking whether food system plans developed by boards with more representation from BIPOC individuals include more equity measures.

The evaluative tool used in this research was designed as a broad survey of what is incorporated into the agendas of food system plans, but much could be gained with more nuanced explorations of the ways or the degree to which specific strategies or issues in policy areas are advanced in plans. One exploration would be through tertiary scoring to determine instances of the integration of a topic, such as urban agriculture, across multiple dimensions of sustainability. Another way to add depth to the analysis involves inventorying strategies based on mechanism of action, such as regulatory, market-mechanism, and education, to understand how different “levers for change” are applied across food system issues (Moragues-Faus & Marceau, 2019). Besides providing additional depth to analysis of plans and policy, measurement and analysis of the outcomes and impacts of the strategies supported by plans would provide a deeper understanding of food system dynamics.

The specificity of policy areas chosen had direct consequences for observed inclusion rates.

In choosing to collapse many different types of food system strategies into 26 categories, some detail was lost. Future evaluations may build on our work by specifying subcategories or utilizing indicators to measure the success of efforts across policy areas. The sample data set could also have affected findings; for example, including less comprehensive food system plans—those focused on less than five components of the food system—may have led to more variable inclusion rates. Additional coders are frequently used in a research team to increase the validity of qualitative data; in the absence of a second coder, however, multiple authors reviewed and offered input into classification and the criteria used to inform interpretation of plan elements.

Food system plans represent the final product of a complicated policy-making process that can be visualized as interactions between the “problem stream” and “politics stream” that shape the “policy window,” together with “policy entrepreneurs” who are informed by the “policy stream” (Sabatier, 2007). Groups involved in food policy face a host of challenges at various stages in this process, as described earlier. To further investigate the constricting and enabling forces that shape food system plans, case studies may be better suited to discerning the particular local forces behind policy than content analysis conducted on refined public-facing plan documents. Research is sorely needed to document the past experience of plans successfully translated into action and change in food systems with the intended impacts.

Because a food system plan is only a slice of a greater policy landscape, there is an opportunity to assess a larger policy landscape by including all planning or policy elements that could have a bearing on food systems, even if they exist outside food system plans. Food system plans are often complemented by resilience or sustainability goals and plans, growth management plans, land use plans, solid waste management plans, and others that can affect a local food system. Therefore, expanding this type of analysis to include the broader policy and planning environment would provide fuller insights into the impact of planning on food, although this was beyond the scope of the current study.

The enduring challenge that exists in planning

for sustainable food systems is that different issues are important in different places, each with differing levels of urgency, so plans need to address every impact area at a specific point in time. However, the path toward sustainability must recognize the ways in which society, the environment, and the economy interact across temporal and spatial scales. Gragg et al. (2018) show that, whereas in the short- to mid-term these three dimensions may exist completely apart from one another, over a longer timespan they overlap and eventually become nested; that is, economy is nested within society nested within environment. This model conveys that what may not be critical now may be defining or constraining later. A final suggestion for future research is the development of tools to help communities prioritize place-based strategies, such as that developed by Moragues-Faus and Marceau (2019), but based on understanding how dimensions of sustainability interact at various spatial and temporal scales (Gragg et al., 2018).

Policy and Practice Recommendations

Food systems play a critical role in the sustainability of communities. To ensure that these systems further the goals of a society, a local food system strategy ought to be a forward-thinking and long-range plan that balances the goals of social justice, ecological health, and economic development. This research identifies which topics food system plans currently address and those less frequently included.

Because there will always be diverging opinions about what ought to be sustained and for how long, with little regard for balance between social, environmental, and economic priorities, food system planners and others advocating in this area can improve awareness, integration, and communication of the complex relationships within and among the chain of food system activities across the dimensions of sustainability. This may require practitioners to engage subject-matter experts (especially local community members) who can assist

with the integration of food system policy in plans and translate between languages of economics, environmentalism, and social justice, as well as to utilize data to convey the value of initiatives in these connected realms of community wellbeing (S. Campbell, 1996). The need for alternative measures of wellbeing that extend beyond economic and market measures is well documented (S. Campbell, 1996; Giannetti et al., 2015), and such measures would go a long way toward establishing a foundation for systems thinking across the dimensions of sustainability in every sector. While multiple indices have been developed to adjust, supplement, or substitute for gross domestic product, consensus is still needed before any single index or combination of indices is adopted as a standard (Giannetti et al., 2015). Practitioners can facilitate conversations about measurement, at every level of governance, by convening locally and regionally about how to determine more meaningful social and biophysical measures of progress.


An immediate step that practitioners can take toward comprehensive food system planning is to include environmental assessments in their toolbox and to center equity as a guiding principle in their planning processes and plans. Plans should ensure that the unique experience of vulnerable groups is honored, leading to more strategic action that promises better results for all groups and the narrowing of gaps among them. Loh and Kim (2020) provide examples and recommendations from which food practitioners can draw for inclusion of equity in comprehensive plans. Social equity² impact assessments (Dundore, 2017) can help communities consider how people, place, process, and power are interrelated in a particular plan, policy, or proposal. This meaningful engagement should originate during the early stages of discussions about how to evaluate the local food system, and continue indefinitely. Shared ownership of agenda-setting and implementation and accountability across diverse partners are essential to achieving inclusive and impactful outcomes.

² The widening gap in wealth and wellbeing across certain groups in the U.S. is well documented. In addition to race and gender, class dynamics in combination with the nature of the American economy help explain the still growing disparities between the best and worst well-off. Literature that explores the growing divide between the wealthiest Americans and the poorest includes *The American class structure in an age of growing inequality* (Gilbert, 2020) and an analysis by Elliott et al. (2019).

Conclusions

Sustainable food systems have become an aspirational goal for many localities, with the concept of sustainability cited as an overarching framework for helping communities recognize links among equity, environment, and economy. This study is the first to improve our understanding of what issues U.S. localities are addressing in their food system planning, using the three dimensions of sustainability as a guiding framework. The evaluation developed in this research can be repurposed by local governments as an audit of existing policy or to frame future planning efforts. By describing the evaluative tool, we enable others to reproduce and build on these findings. (A more detailed description of the tool and a more thorough example of its application can be found in Karetny [2020]). The data set of plans in this work represents the most comprehensive list of plans we have been able to find and may provide useful examples for practitioners, researchers, and communities seeking to create their own food system plans.

Specifically, we found that food system plans vary greatly in the inclusion of sustainable food system policy impact areas, although there are examples of high policy inclusion in every dimension of sustainability and at most of the scales examined. Cities, counties, and regions that operate in very different contexts nevertheless attain high levels of inclusion in one or more dimensions. Furthermore, there is much creativity in the strategies across the data set. The collective awareness of lo-

cal governments around pressing food system issues is multidimensional and includes innovative strategies that span urban and rural regions. These approaches lay a rich foundation for policy evolution. As for policy impact areas excluded from plans, these too span the three dimensions of sustainability among the 28 food system plans analyzed. Impact areas more frequently left out of plans include strategies that address participation in policy-making and stewardship of specific natural resources, two critical components of just and ecologically sound food systems. The absence of these particular policy impact areas, especially in tandem, place the resilience of the food system at risk and may require reactive responses to crises down the road (similar to the response to disruptions in food supply chains during the COVID-19 pandemic), although we acknowledge that these issues may be addressed in planning or policy not specifically identified as food system planning. Finally, communities do not need an exhaustive agenda to develop a relatively comprehensive food system agenda, as we find examples of plans that include a high proportion of policy impact areas with relatively fewer plan elements. Our primary recommendations to address gaps in existing food system plans are to develop new indices of value to measure social and environmental wellness that can be factored into more implementation research, and expanding the conceptualization of food system issues by practitioners as steps toward more holistic planning for sustainable food systems. 

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Appendix 1. U.S. Comprehensive Food System Plans at the Substate Level as of October 2021

#	Scale	Jurisdiction	Plans	Year	Included / Reason for Exclusion
1	Region	City of Fargo, and Cass, ND, and Clay, MN, counties	Metropolitan Food Systems Plan	2013	Included
2	Region	Delaware Valley Region, 9 counties across NJ and PA	Eating Here: Greater Philadelphia's Food System Plan	2011	Included
3	Region	Douglass and Sarpy, NE, and Pottawattamie, IA, counties	Healthy Food for All: A Community Food Security Plan	2018	Included
4	Region	Mid-South Region, 15 counties across AR, MS, and TN	Delta Roots: The Mid-South Regional Food System Plan	2015	Included
5	Region	Northeast Kingdom, Caledonia, Essex, and Orleans counties, VT	Regional Food System Plan for Vermont's Northeast Kingdom	2016	Included
6	County	Pioneer Valley, Franklin, Hampshire, and Hampden counties, MA	Pioneer Valley Food Security Plan	2014	Included
7	County	Arlington, VA	Recommendations for a Food Action Plan	2013	Included
8	County	Beaufort County, NC	Healthy, Fresh, Local Food: An Action Plan for Increasing Availability and Access	2013	Included
9	County	City and County of Denver, CO	Denver Food Vision	2018	Included
10	County	City of Columbus and Franklin County, OH	Local Food Action Plan	2014	Included
11	County	Douglas, KS	Douglas County, KA Food System Plan	2017	Included
12	County	King, WA	Local Food Initiative	2015	Included
13	County	Mendocino, CA	Mendocino County Food Action Plan	2014	Included
14	County	Montgomery, OH	Food Equity Plan	2019	Included
15	County	Multnomah, OR	Multnomah Food Action Plan	2010	Included
16	County	Santa Barbara, CA	Santa Barbara County Food Action Plan	2016	Included
17	County	City and County of Santa Fe, NM	Planning for Santa Fe's Food Future	2014	Included
18	City	Sonoma, CA	Sonoma County Healthy and Sustainable Food Action Plan	2012	Included
19	City	Wake, WA	Moving Beyond Hunger	2017	Included
20	City	Asheville, NC	City of Asheville Food Policy Goals and Action Plan	2017	Included

continued

continued

#	Scale	Jurisdiction	Plans	Year	Included / Reason for Exclusion
21	City	Baltimore, MD	Baltimore Food System Resilience Advisory Report	2017	Included
22	City	Detroit, MI	A City of Detroit Policy on Food Security	2008	Included
23	City	Greensboro, NC	Greensboro Fresh Food Access Plan	2015	Included
24	City	Niagara Falls, NY	Niagara Falls Food Action Plan	2018	Included
25	City	New York, NY	FoodWorks: A Vision to Improve NYC	2010	Included
26	City	Riverside, CA	Food Policy Action Plan	2015	Included
27	City	Seattle, WA	Seattle Food Action Plan	2012	Included
28	City	Somerville, MA	Somerville Food Plan	2019	Included
Not Included in Data Set					
29	City	New York, NY	Growing Food Equity in NYC: A City Council Agenda	2019	Plan missed in 1 st selection phase
30	City	New York, NY	Food Forward NYC	2021	Adopted after sample search period
31	City	Atlanta, GA	East Point City Agriculture Plan	2021	Adopted after sample search period
32	City	City of Phoenix, AZ	2025 Phoenix Food Action Plan	2020	Adopted after sample search period
33	City	Minneapolis, MN	Minneapolis Food Action Plan	—	In development
34	City	Pittsburg and Alleghany County	The Greater Pittsburgh Food Action Plan	2020	Developed after study search period, unclear if adopted
35	County	Wichita and Sedgwick County, KS	Wichita and Sedgwick County Food System Master Plan	—	In development
36	County	San Diego County, CA	San Diego County Food Vision 2030	2021	In development, unclear if being adopted
37	Region	Sacramento Region, 6 counties, CA	Valley Vision Food System Action Plan	—	In development, unclear if being adopted
38	Region	City of Buffalo and Erie County, NY	The Buffalo and Erie County Local Food Action Plan	2020	Adopted after study search period
39	Region	Southeastern Wisconsin Regional Planning Commission (SEWRPC), WI	Regional Food System Plan	—	In development
40	Region	New England Region	A New England Food Vision 2060 Update	—	In development, unclear if being adopted

National food security, immigration reform, and the importance of worker engagement in agricultural guestworker debates

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Abstract

This article looks at the United States' federal H-2A Temporary Agricultural Visa Program and reforms proposed by the Farm Workforce Modernization Act. In this policy analysis, we draw on media content analysis and qualitative interviews to compare the viewpoints of farmers, workers, grower and worker advocacy groups, intermediary agents, and politicians. We find that perspectives on the program are dependent upon actors' level of direct interaction with workers. Moderate-sized farmers and regionally based worker advocacy groups tend to be the most concerned with day-to-

day program operations and fair working conditions. In contrast, national-level advocacy groups, intermediary agents, and politicians are less critical of the program and seek to broadly expand farmer access to guestworkers, justifying proposed program reforms with discourses of national food security and immigration reform. Ultimately, we suggest that engaging a food systems lens to understand these policies provides a more nuanced perspective, addressing national food security and immigration as related issues.

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Keywords

Farmworkers, Farm Labor, Agricultural Policy, Guestworker Programs, H-2A Program, Food Security, Immigration Reform

Introduction

Do people want to eat in this country or not?

—Doug LaMalfa (R-CA), July 2022

This quote was included in a National Public Radio (NPR) article published on July 18, 2022, titled, “The Senate is nearing a deal on immigration that could also lower food prices” (Bustillo, para. 8). LaMalfa was speaking at a GOP-led press conference hosted by the American Business Immigration Coalition on the Farm Workforce Modernization Act. We found that this narrative—that deregulation and institutionalization of the H-2A Temporary Agricultural Visa Program is the silver bullet for food security—is reinforced by countless national and regional publications. This perspective reflects the talking points offered by the farm business lobby and a bipartisan majority of politicians in the United States today. The federal H-2A Temporary Agricultural Visa Program (H-2A Program) allows U.S. farmers to legally sponsor foreign-born guestworkers for seasonal agricultural work when domestic laborers are not available. Although this program generally has made up a small portion of the overall agricultural workforce since its inception in 1952, program usage tripled over the past seven years to a total 15% of the agricultural workforce in 2021 (Martin, 2021).¹ This growing popularity has prompted heated debates about potential reforms, most recently regarding the Farm Workforce Modernization Act (FWMA). At the date of this publication, the FWMA had passed in the House of Representatives with a vote of 247-174 in March 2020 (Text – H.R.1603 – 117th Congress, 2021-2022), but is still awaiting a senate vote that is likely to face a tighter margin to pass.² If this bill were to pass, the H-2A Program would be expand-

ed to include year-round agricultural industries, provide a pathway to citizenship for some workers, and alter the calculation of the adverse effect wage rate, temporarily capping the potential for wage increases (Actions – H.R.1603, 2021-2022).

The current discussions regarding the H-2A program and year-round expansion are the latest iteration of guestworker policy debates in the U.S. Historically, the most well-known agricultural guestworker program is the Bracero Program, a temporary worker agreement between the U.S. and Mexico, which was started to address the labor shortage during World War II. Farmers successfully lobbied to maintain the program well after the war ended, until its termination in 1964, following ongoing reports of unjust labor practices, evidence that the program was bringing down farmworker wages, as well as reduced need due to mechanization in cotton and sugar-beet production (Martin, 2020; Newman, 2018). The Bracero Program was largely used by farmers in the U.S. West, where industrialized agriculture was most developed (Mitchell, 2012; Weiler et. al. 2020). Lesser known, but important to the history of immigration from the Caribbean, is the British West Indies Program, which continued beyond the Bracero Program and provided farmworkers mostly to East Coast growers (Hahamovitch, 1997).

Given this long history of U.S. reliance on foreign-born workers in the agriculture system, agricultural and immigration policies today are heavily intertwined, affecting actors throughout various economic sectors. The vested actors in agricultural labor policy and FWMA debates include farmers, workers, politicians, intermediary hiring agents, and grower and labor advocacy groups. Our analysis shows that their perspectives on the H-2A Program are largely dependent on their needs and experiences; in particular, how much they engage with agricultural workers directly. In this article, we discuss the nuances of the debate surrounding the FWMA and H-2A Program, considering the varied positionalities of these

¹ The H-2 Program was initiated in 1952 under the Immigration and Nationality Act. The program was split into 2 categories in 1986, including the H-2A Program for agricultural workers and H-2B for other temporary workers.

² Given that 2022 is a congressional election year, if the bill does not pass the Senate before elections, it will have to be reintroduced and go through another round of votes in the House of Representatives as well.

respective actors, to better inform the consequences of potential agricultural labor reforms.

In this analysis, we find that politicians and grower advocacy groups draw on broad discourses of food security and immigration reform to promote expansion of the program. Food security as a discourse has been critiqued by scholars and activists alike in the ways that the term shallowly quantifies and glosses over the multiscalar and structural causes of hunger. Yet, the term endures in international and domestic political and policy spheres as it affirms the neoliberal construct of simple supply and demand factors to explain world and national hunger (Jarosz, 2011; 2014). In contrast, we find that moderate-sized³ farmers and regional worker advocacy groups, who are more engaged with the day-to-day workings of the program, view food system vulnerabilities (and relatedly, food insecurity) to be rooted in the highly politicized and unstable nature of immigration and labor policy as well as inequalities throughout the food chain. Scholars note the ways these inequalities emerge in agrarian labor structures as hierarchies of worker rights, and across farm scales, through food system concentration at the farm and market levels, with institutionalized preferences for larger operations (Clapp, 2021; Dupuis, 2002; Holmes, 2013; Lyson et al., 2008; National Research Council, 2003; Smaje, 2020). Failing to take a critical approach to food systems manifests in vulnerabilities such as those seen during the COVID-19 pandemic: supply chain disruptions and inflation (Ebata et al., 2021; Huber, 2020; Van der Ploeg, 2020). Inequalities in the food system therefore threaten long-term social, economic, and environmental sustainability (Friesner, 2016).

In our concluding discussion, we suggest that a food systems framework would alleviate some of the disjunction in such perspectives (see Burmeister & Tanaka, 2017). Seeing farmers, intermediaries, and workers as part of a larger food system, rather than as opposing actors, helps to address disjointed and politicized narratives regarding farm labor reforms.

Methodology

This policy analysis is informed by a two-year mixed-methods study of the H-2A Program. The focus of this article is an analysis of media sources covering the H-2A Program and FWMA from June 2021 through February 2022. To grasp a broader scope of political and media narratives pertaining to the program, the authors completed a content analysis of public statements and media coverage surrounding the H-2A Program and the FWMA, utilizing a Google Alert and a Google Scholar Alert for the terms “H-2A,” “H2A,” and “Farm Workforce Modernization Act.” Media coverage on this topic at times included internationally recognized news sources, but largely consisted of regional and agriculture-specific newspapers, newsletters, and magazines, all of which published content online. The media content was then aggregated by theme to identify dominant trends in media coverage of both the program and the FWMA.

We contrasted our media analysis with our qualitative data, collected from 2019 to 2021. This data includes semi-structured interviews and focus groups conducted with 13 moderate-sized specialty crop farmers and 35 farmworkers in New York State, as well as with four intermediary agents that facilitate the worker hiring process on a national scale. These interviews were conducted primarily by Mary Jo Dudley, director of the Cornell Farmworker Program at Cornell University. Interviews and focus groups lasted approximately one hour each and took place most often on the farms on which participants operate or are employed, and occasionally by phone, due to the COVID-19 pandemic. Interviews with intermediary agency staff were conducted in secure locations at industry conferences. All interviews were voice recorded with participant permission and then transcribed. Interviews were then coded and analyzed using Dedoose software (version 9.0.54). Drawing on these varied primary sources, we demonstrate the ways that the media portrayal of the H-2A Program differs from the experiences of those most directly engaged in the program, specifically when

³ Although what counts as a small, moderate, or large farm can vary with region and commodity and is not an exact measure, it is generally accepted that smaller farms gross less than US\$250,000–US\$300,000, and often realize sales of only a few thousand dollars (Guptill & Welsh, 2014).

considering their level of interaction with workers on the ground.

What Are Politicians Saying About the H-2A Program and FWMA?

In our analysis of political media content, we looked for common themes regarding the H-2A Program and FWMA.⁴ In most accounts, we found bipartisan political support for the H-2A Program among prominent Republican and Democratic national leadership (Hoard's Dairyman, 2021; Nepal, 2021). This support was justified largely through two arguments: a lack of willing and legal domestic labor, and concerns about national food security (Mejia, 2021; Sewell, 2021). Opinions began to diverge on partisan lines concerning the intricacies of the FWMA, with many conservative members of Congress expressing reservations related to immigration reform (Davies, 2021; Donovan-Smith, 2021). This is a particularly interesting dynamic as the constituencies of many conservative members of Congress are made up of rural farmers currently excluded from the program and/or desperately seeking a stable labor force via program reform (Schulte & Pitt, 2021). In this section we look at how politicians discuss the program and the proposed reforms in national and local media.

National Food Security

Our media analysis revealed that among politicians, national food security is ubiquitous as a justification for the program. After visiting with farmers in his state, Senator Mitt Romney (R-UT) stated, "People here face some tough times—they just can't get labor ... but the government slows down the process, makes it hard to hire workers ... If we can't have workers, we're not going to be able to feed our own people" (Mejia, 2021, para. 14). Similarly, in a conversation between Congressman Dan Newhouse (R-WA) and Congressman Glenn Taylor (R-WA), Congressman Taylor said, "This isn't a money problem. This is a labor problem, and that's a food security issue" (Newhouse, 2021, para. 10). Democratic Senator Dick Durbin (D-IL),

in his statement at the opening address of a Senate Judiciary Committee hearing on the Act, explained, "During this pandemic, we've all been forced to face the reality that our food supply chain depends to a great extent on the labor of immigrants" (Dick Durbin United States Senator Illinois Newsroom, 2021, para. 3). He added that, "When we debate legislation like the Farm Workforce Modernization Act, what we're really debating is the future of America and particularly rural America" (Dick Durbin United States Senator Illinois Newsroom, 2021, para. 11). On both sides of the aisle, national food security is central to the discussion of and justification for the new bill.

Calls for Immigration Reform

Despite widespread, bipartisan support for the H-2A Program, our media analysis showed that the specific changes proposed by the FWMA are still contentious among politicians. Conservative criticisms of the FWMA are related to changes to immigration policy. Many conservative politicians recognize the importance of this bill to meet the needs of their rural constituency, but oppose the bill based on the inclusion of an eight-to-14-year pathway to permanent residency and citizenship, which they perceive as "amnesty," for legal, H-2A immigrant workers. These politicians demand that the border be "secured" prior to supporting an H-2A Program reform bill (Davies, 2021; Donovan-Smith, 2021; Kealey, 2021; Shike, 2021). To this point, Senator Lindsey Graham (R-SC) stated, "You don't give amnesty and hope people won't keep coming. ... You secure the border, then you provide legal status. We're doing it ass backwards" (Donovan-Smith, 2021, para. 15). Similarly, Senator Charles Grassley (R-IA) said, "I don't see this [Biden] administration wanting to reverse their open-border policy, and that is going to make it very hard to get 60 votes in the United States Senate to get anything done" (Kealey, 2021, para. 9). Senator John Kennedy (R-LA) commented, "We're not going to change the immigration laws, and, more specifically, pass amnesty [referring to the FWMA] until we get control of the border"

⁴ While there is also much media coverage on violations to H-2A regulations and vaccine requirements, those topics are not the direct focus of this policy analysis and will not be covered extensively here.

(Boyanton, 2021, “Reconciliation Option,” para. 2). It remains unclear what a “secure border” would mean, or the conditions by which these senators view immigration as justified.

As described above, while overall support for the H-2A Program is strong across political parties—based on the recognized need for a legal immigrant workforce to satisfy labor needs and ensure national food security via protecting U.S. agricultural viability—there is not universal support for related legislation to alter the H-2A Program. While proposed alterations to the program are considered meager by many, including some of the moderate-sized farmers and workers we interviewed, as well as some labor advocates, the FWMA remains contentious among most Republican senators.⁵ The rejection of the bill comes from concerns about what an expanded H-2A Program would mean for “border security.” Yet, few tangible recommendations to improve the bill have been advanced.

What Are Growers and Grower Advocacy Groups Saying About the H-2A Program and FWMA?

While the H-2A Program has come under fire from right-wing media outlets and politicians for enabling immigrants to “steal jobs,” farmers are acutely aware of the inability to find domestic labor to meet their needs, despite the labor force of approximately 16 million Americans who remain jobless (Binder, 2021). Both our media analysis and interviews with farmers revealed the ubiquity of the lack of domestic-born farmworkers available under current conditions. *The Guardian* recently published a series with an article entitled, “‘It’s Five Years Since a White Person Applied’: The Immigrant Workforce Milking America’s Cows” (Sewell, 2021). Similarly, an article in the *Associated Press* titled, “Rural Population Losses Add to Farm and Ranch Labor Shortage,” reflected on 2020 U.S. Census data (Schulte & Pitt, 2021). Decreases in

the U.S. rural population, such as those reported in the latest census, are not a new phenomenon (Cromartie, 2017; Goetz & Debertin, 1996; Henderson, 2021; Johnson & Lichter, 2019) and continue to affect farmers’ ability to find a regular and experienced workforce. The H-2A Program has long been a release valve for these labor acquisition struggles.

Here, we examine the differences in grower perspectives on the H-2A Program and FWMA between moderate-sized farmers and farmers as portrayed by media sources. As articulated above, regardless of who is speaking, growers are generally supportive of the H-2A program, based on a lack of other viable labor options. In interviews, we found that farmers’ concerns with the program and their representation in decision-making spaces are very different from the concerns and voices represented by media coverage. We argue that such media highlights the perspectives of farmer advocacy groups, which are more focused on broader policy changes, as compared to the day-to-day concerns of farmers on the ground. In the next section we highlight the voices of moderate-sized farmers from New York State who utilize the program, looking at how their viewpoints contrast with the dominant narratives amplified by local and national media.

On the Ground: Farmer Perspective

We conducted farmer interviews with moderate-sized specialty crop farmers across New York State. Specialty crop workers made up 76% of all national H-2A workers in 2019 (Castillo et al., 2021), and most specialty crop farmers using the H-2A Program are moderate-sized operations (Minkoff-Zern et al., 2022; U.S. Department of Labor [US DOL], n.d.).⁶ Eighty percent of these farms hire fewer than 50 workers per season, with 63% of farms hiring fewer than 25 workers per season (Minkoff-Zern et al., 2022). This sample of interviews with moderate-sized specialty crop

⁵ We highlight the voices of Senators in this analysis given that during the time period of our research, the FWMA was being debated in the Senate and not in the House of Representatives.

⁶ In our previous research (Minkoff Zern et al., 2022), we used the term “horticulture” instead of “specialty crop,” reflecting terminology often used in the field of rural sociology. In this article we use the term “specialty crop,” as it is a more broadly understood term that encompasses fruit and vegetable growers.

farmers therefore represents the most common type of farmers using the H-2A program.

As compared to political narratives that draw on national food security to justify H-2A Program reform, the farmers we interviewed articulated that the institutionalized and politicized natures of the program were the real threats to their productivity and security. Farmers argued that farm instability and insecurity manifest in the forms of politicized immigration debates, high program costs and low profit margins for farmers, and the bureaucratic nature of the program.

Some farmers we interviewed noted the effects that politicized immigration debates have on their ability to access labor. An orchardist noted, “You have no clue where your labor force is going. What kind of regulation is coming up. You have to keep your toe in all the different waters.” A vineyardist also stated,

I see issues with the H-2A Program, for no good reason, getting mingled up in national politics regarding immigration ... even though it’s really an indispensable program. I’m afraid it won’t be able to stay totally free of that. So, I see that as a potential problem. There are politicians who love to talk about, you know, jobs for Americans, and point attention ... reflecting these programs in a negative light. When the reality is that there is absolutely no viable alternative. So, I do worry about national politics creeping in and making things more complicated.

Additionally, many farmers commented on the ways that the bureaucratic nature of the H-2A Program, during both the hiring process and the growing season, is an additional barrier to the program to meeting their labor needs. Another orchardist shared,

I have to document, document, document everything in really ridiculous detail. When I prepped for my first audit, I spent days copying all these documents and getting all the stuff organized. And then it still wasn’t enough. ... H-2A—I’ve got to do even more. You know, your long day gets even

longer. The amount of record-keeping is onerous.

A vegetable farmer similarly said, “H-2A has become expensive. It’s a hassle and now everybody, you have to have expertise in that. In navigating the system as well. That’s something your average farmer doesn’t know how to do.” For moderate-sized farmers, who make up the majority of H-2A Program users, the day-to-day viability of the program, including cost, access to workers, and paperwork, is of greatest concern. This differs drastically from the narrative of many politicians, who focus on more abstract concepts such as national food security and immigration reform. And as we discuss in sections below, farmer perspectives contrast with those of intermediaries as well.

Media Perspective: Grower Advocacy Groups

While our interviews focused on moderate-sized farms, who are the majority of users of the H-2A program, much of the media coverage highlights grower advocacy groups as a proxy for farmer perspectives. These groups represent a diverse array of farms, yet the work of these groups often occurs within policy spheres, with a level of physical and intellectual distance from functioning farms that arguably leads to an oversimplified understanding of the needs of H-2A Program users. Grower advocacy groups overwhelmingly support the program and the FWMA as the best option for agricultural labor access. Over 300 groups of producers, including the Western Growers Association, the National Council of Agricultural Employers, the National Milk Producers Federation, and the National Pork Producers Council, among many others, have expressed support for reforms to the H-2A Program and the passing of FWMA, asserting that it is essential to producers’ economic stability (National Council of Farmer Cooperatives, 2019; Shike, 2021).

Many farms represented by these groups currently do not have access to the H-2A Program due to the seasonal labor requirements of the program. These grower groups strongly advocate passing the FWMA, which would facilitate year-round H-2A labor access (Dumas, 2021; Sorenson et al.,

2021). This proposal is somewhat ironic, as the seasonal nature of agriculture is the very reason the H-2A Program has been justified to operate as long as it has (Garcia, 2014; Shaver, 2009). The particular vulnerabilities of H-2A workers have been generally overlooked by the American public and even most labor activists, due in part to the workers' temporary status. These vulnerabilities include limitations in movement and employment opportunities, including options to switch employers, receive overtime pay, seek legal support without fear of impact on employment, and be rehired (contingent on visa renewal). Yet, with the proposed expansions through the FWMA, most labor protections and privileges would still be lacking, while workers would become further entrenched as both laborers and residents in the U.S.

An opinion piece co-authored by eight large meat-production and -processing associations was recently published in the agricultural industry publication, *Agri-Pulse*, titled "Tough Immigration Conversations Needed to Help Keep Meat and Poultry on Grocery Store Shelves." The authors wrote, "Bringing nutritious and affordable animal protein to the plates of consumers requires a strong, efficient supply chain—and that supply chain is hindered by the lack of access to a skilled, reliable workforce for agricultural and food processing operations across the country" (Sorenson et al., 2021, para. 1). Producers who do not have broad access to the program based on the current requirement of seasonality include dairy, pork, mushrooms, and some greenhouses (Lahoud, 2021; Mulhern, 2021; Shike, 2021).

This narrative of ensuring national food security, while not acknowledging the specific impacts of the program on moderate-sized farmers or laborers themselves, draws directly from the ways that political and advocacy groups promote the H-2A Program in the media and other public spheres. Such farmer advocacy groups point to bipartisan support of the H-2A as *justification* for decisions, despite politicians not being directly affected by program changes. For example, the National Milk Producers Federation recently released a statement stating, "Recent history shows bipartisan support for farm workforce legislation that addresses the needs of producers and farmworkers. It is critical

that the government continues to build on these bipartisan efforts to create a system that provides secure, legal employment" (Hoard's Dairyman, 2021, para. 5).

Our analysis shows that the experiences and opinions of on-the-ground farmers differ substantially from the narratives of grower advocacy groups. Farmers, and especially moderate-sized farmers, are concerned largely with their own economic survival and focusing on their day-to-day experiences, such as the expense of the program, the complexity of paperwork and regulation, and the political vulnerability of working with immigrant populations. While all farms may be affected, the literature reveals that moderate-sized farms likely receive the brunt of these burdens, as many of these concerns can be more easily absorbed or outsourced by larger-scale farms (Bekkerman et al., 2019; Hoppe, 2015; Lyson et al., 2008). Meanwhile, advocacy groups' opinions tend to mirror that of politicians and intermediary agents, advocating for the cheapest and most widely available labor pool possible. These groups draw on consumer fears regarding national food security and the rising cost of food if the H-2A Program is not reformed.

What Are Intermediaries Saying About the H-2A Program and FWMA?

Intermediary agents are contracted privately by farmers to help them navigate the complex application and recruitment processes necessary to use the H-2A Program. Similar to politicians and grower advocates, intermediary agents discussed the necessity of program reform to guarantee long-term national food security and independence. Despite the fact that their profession benefits from the bureaucratic nature of the program, they also empathized with many farmers over the struggles they experience, such as unwieldy paperwork and high costs. Although some intermediaries' interviews reflected an awareness of farmers' reality, a continued emphasis on national food security reflects the ways that politicians and grower advocacy groups' voices, rather than on-the-ground farmers or farmworkers, often dominate the stories used to justify how such policies are presented in popular media. In contrast, intermediaries' views of the immigration process were more pragmatic than

political, as intermediaries work to recruit workers directly, which influences their understanding of labor availability abroad.

One agent we interviewed works for one of the largest H-2A recruitment agencies in the U.S. They are based in Texas and recruit workers directly from Mexico. When we asked her about the proposed changes to the H-2A Program, she responded in reference to the threat to U.S. food security and independence:

The government has to do something to streamline it, to modernize it [the H-2A Program]. If they don't, a lot of these farms, they're going to go out of business. And we're going to end up buying a lot of fruit from China. I mean it really does come to that.

Another agent, based in New York State, made a similar argument while discussing the physically demanding nature and increased costs of agricultural production in the U.S.:

I see the H-2A Program burning and crashing if there aren't changes in it. I don't know what we're going to do for food. We may end up importing it. ... I can say that the program is getting so expensive that eventually it's going to exceed the cost of production. And once that gets to that point ... unless there's some other way that farmers can get their labor, I don't see us farming in the U.S. Not seasonal farms.

Similarly to politicians, intermediary agents drew upon the discourses of national food security and international competition as a way to justify broadening the program. In addition, intermediaries commented on changes necessary to make the program more sustainable, noting the financial, regulative, and paperwork burdens on farmers. One intermediary said,

The process itself, like the application itself, everything they have to go through that the Department of Labor and United States Citizen and Immigration Services. And then all the audits. I mean there has to be a way to simplify

things. There really does. I don't know, they [government agencies] have a mentality that, you know, they almost treat them [farmers] like criminals. (laughs) When they're actually trying to do right by, by everything. They're trying to do things legally. They're not hiring illegals.

Another intermediary agent similarly stated,

The overall cost of the program. Not just the adverse effect wage rate, but the entire cost. And more flexibility and less bureaucracy. There are so many rules that the farmers have to follow and they're so complicated that they have to hire an agent in order to get them through the process. Simplicity of the program. Simplify it. Make it easier.

By emphasizing the H-2A Program as the route to national food security, this labor structure necessitates intermediaries' continued involvement by further institutionalizing existing labor relations, adding additional burdens to farmers while directly profiting from that burden. Intermediaries' bridged experience between multiple program actors allows them to recognize the detrimental impact that the current operation of the program can have, especially on moderate-sized farmers. Yet they still have a vested interest in the recruiting, hiring, and regulatory processes of H-2A remaining complex, as their ability to profit from the program depends on it.

What Are Workers Saying About the H-2A Program and FWMA?

Although workers are directly affected by any changes to the H-2A Program, including changes proposed in the FWMA, their perspectives are not often seriously considered by policymakers. This is reflective of their relative power in U.S. agricultural decision-making spaces (Brown & Getz, 2008; Clapp, 2021; Gray, 2013). Criticisms of the H-2A Program mentioned by interviewees include the inability for workers to move from farm to farm, communication difficulties with employers based on language differences, the instability of employment due to longer-term work arrangements determined solely by employers' desires, violations of

housing or work contracts, and discrimination, at times leading to dangerous situations in communities where workers live in the U.S.

The majority of worker membership-based organizations, including Food Chain Workers Alliance, *Familias Unidas por La Justicia*, the Workers Center of Central New York, *Alianza Agrícola*, *Comité de Apoyo a los Trabajadores Agrícolas*, the Farmworker Association of Florida, Justicia for Migrant Workers, and Migrant Justice, oppose the FWMA or any expanded version of the H-2A program. These FWMA-opposing worker organizations focus on organizing workers at a regional level. In a petition supported by these groups and others, titled “Oppose the Farm Workforce Modernization Act of 2021,” they point out that the bill creates a complicated and limited pathway to citizenship that does not include all farmworkers who labored through the COVID-19 pandemic, makes e-verify mandatory in agriculture, and does not provide workers with a right to organize and collectively bargain without fear of retaliation (The Action Network, n.d.).⁷ In addition to such criticisms listed in the petition, worker advocacy groups also highlight that the act lacks several features desired by workers: a path to green cards for current farmworkers, increased regulations to ensure fair wages, accountability for farm labor contractors, and an accessible grievance process for workers (The Action Network, n.d.; Nateras, 2021; National Farm Worker Ministry, 2021).

Additionally, workers and worker advocacy groups are aware of the worker hierarchy created by the program, which is amplified by proposed changes. For example, despite decades of propping up labor needs for domestic agriculture and supporting national food security, undocumented workers are not eligible for an H-2A visa (Nateras, 2021). One worker we interviewed remarked on this double standard for undocumented workers already in the U.S., saying, “The big problem that I see with this H-2A visa is that many people could possibly have the opportunity, but they have already been here. The opportunity is lost.”

Despite the overwhelming criticism of the policy from worker organizations, two organizations

that have prominent policy foci, Farmworker Justice and the United Farm Workers (UFW), support the bill, as it provides a more regulated and legal option for farmworkers (Farmworker Justice, n.d.; Sherman, 2021). Similarly to the grower advocates’ perspectives described above, the focus of these groups on policy, versus direct organization with workers, seem to shape their opinions on the FWMA. These groups argue that the act provides a realistic route to bringing positive changes for farmworkers, in contrast to the status quo (Farmworker Justice, n.d.; Fu, 2021). In contrast, other worker groups are not willing to compromise on this bill. The political director at *Familias Unidas por La Justicia* expressed, “I’d rather fight for something I believe in and lose, than pass something that’s going to be hurtful” (Fu, 2021, para. 23).

Conclusion

Any changes to the H-2A Program will be enormously consequential for agriculture in the United States. As we have discussed, nuanced viewpoints on the H-2A Program and the FWMA result from a variety of positions among affected agricultural actors. Politicians across the political spectrum support the H-2A Program, as it fulfills the labor needs of their constituents, many of them drawing on discourses of national food security. Yet, the reforms outlined in the FWMA are more broadly supported by Democrats than Republicans in the Senate, with concerns about immigration reform blocking bipartisan support.


We have found that grower perspectives on the H-2A Program and FWMA reforms are largely dependent on the level of direct interaction they have with workers. National-level grower advocacy groups, whose leaders are more removed from the day-to-day functions of farming, especially compared to producers operating moderate-sized farms, broadly support the new bill, arguing for easier access to labor, particularly for year-round production sectors. Their sweeping promotional statements miss the concerns expressed by farmers on the ground. In contrast, issues highlighted by moderate-sized farmers include program cost, paperwork, and labor stability, while national food

⁷ E-verify is an online system that can track the identity and legal employment eligibility of worker in the United States.

security was not seen as most pertinent to the program's function and/or potential reform. Intermediaries recognize some of the trials of moderate-sized farmers but actively benefit from continued business opportunities due to the bureaucratic nature of the program. Finally, worker advocacy groups' level of support is also moderated by their level of direct interaction with workers. Regional worker groups generally oppose the FWMA, while policy-focused groups share similar opinions with grower advocacy groups on this issue.

While arguments across levels of direct worker interaction may be concerned about national food security and immigration reform broadly, what is meant by these terms is not universal. Politicians, grower advocacy groups, and intermediaries' notions of these concepts include unimpeded access to cheap, reliable labor. Yet a more regional and systems-based definition of food security, as suggested by food systems scholars, contrasts with this understanding. A broader understanding of food security—one focused on protecting moderate-sized farms' viability and preventing further concentration of the agricultural sector—provides opportunities for more just food systems to emerge (Burmeister & Tanaka, 2017; Clapp, 2021; Friesner, 2016; Hauter, 2012; Huber, 2020; Smaje, 2020).

Farmworker advocates at the grassroots level make arguments for more inclusive reforms, including pathways to citizenship for all agricultural

workers, not just those involved in H-2A (Nittle, 2021), and immediate green cards for farmworkers who have been essential to maintaining food production throughout the COVID-19 pandemic. Given that the FMWA includes a pathway to citizenship for H-2A workers, although an extremely limited one, we recommend that this policy include all former and current farmworkers, including those who are undocumented. Discourses on national food security and immigration reform, as seen through our media analysis, do not include farmer and worker vulnerabilities on the farm level. Some of these vulnerabilities that could be addressed, such as the ability of workers to organize, the creation of responsive and protective grievance boards for farmworkers, and the ability of farmworkers to switch employers, are not included in the FWMA. By listening more closely to the voices of those most directly affected by guestworker programs, namely, workers and farmers on the ground, policymakers could best prioritize the long-term viability of a diverse agricultural system, especially regarding the ongoing need for more just and sustainable farm labor relations. 

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Perceived barriers to client-choice conversion among Arkansas food pantries

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Abstract

Food insecurity continues to be a problem in the U.S., especially in Arkansas, which ranked second in the nation in food-insecure households in 2020 (Arkansas Food Bank, n.d.). To help address this, community-based food pantries make food available directly to area residents. Food pantry demand has increased during COVID-19, which has exacerbated food insecurity, particularly in the southern U.S. In Arkansas, the Arkansas Food Bank (AFB) serves as the state's largest nongovernmental food aid provider, working with 310 pantries.

Pantries typically distribute food to clients in one of two ways: by using a prefilled bag or box of items (the traditional model), or by allowing clients

to select items (the client-choice model). Although research has shown that the client-choice model has a variety of benefits for client health and well-being, pantries using the traditional model remain the norm in Arkansas, accounting for 87% of total pantries. Currently, there is limited research that identifies perceived barriers to converting to a client-choice model among pantry managers, and that identifies whether perceived barriers and localized concerns contribute to different operation styles among pantries. To address this, we examined perceived barriers to client-choice conversion using a mixed-method survey conducted with 187 Arkansas food pantry managers.

We used common factor analysis to identify four barriers perceived by pantries to converting

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their traditional pantry to a client-choice pantry: (1) food supply concerns, (2) having limited non-food resources, (3) food waste concerns, and (4) confusion from clients and nutritional concerns. A cluster analysis of pantry respondents was also used, based on their level of concern for the four identified perceived barriers. Clusters we identified are Potential Converters (18.2%), Confusion Concerned pantries (56.7%), and pantries who are Skeptics (25.1%). Our findings suggest that food pantry stakeholders may need additional outreach and education concerning the various ways that client choice can be implemented. Our results provide valuable information for those involved in distributing food aid to food-insecure households.

Keywords

Food Pantry, Food Insecurity, Client-Choice Pantry, Food Bank

Introduction

Food insecurity, defined as “limited or uncertain access to adequate food” (USDA ERS, 2021, “CNSTAT Review and Recommendations,” para. 9), continues to be a public health issue experienced by 11% of U.S. households in 2018 (Coleman-Jensen et al., 2019). This number is often higher in southern states such as Arkansas; in 2018, 15.1% of Arkansas households experienced food insecurity (Coleman-Jensen et al., 2019; USDA ERS, 2021). More recent estimates indicate that over half a million Arkansans struggle with hunger, with 31% of these being children (Feeding America, n.d.). Food insecurity is often associated with a variety of health issues, including unhealthy eating practices (Gallegos et al., 2014), increased likelihood of chronic illness (Panet et al., 2012; Parker et al., 2010; Seligman et al., 2010), fatigue (Munro et al., 2013), depression (Bruening et al., 2016), and issues with mental illness and stress (Martin et al., 2016).

To address food insecurity, community-based food pantries across the U.S. routinely make food available directly to area residents, and pantry demand has increased due to COVID-19 (Coleman-Jensen & Rabbitt, 2021). These pantries are often located in community centers, churches, college campuses, and hospitals to maximize con-

tact with area residents (Gany et al., 2013). Many coordinate with an area food bank, which serves as a central storage and distribution center. The food bank provides the pantry with products they can distribute to community members in need. The Arkansas Food Bank (AFB) serves as that state’s largest nongovernmental provider of food aid, working with 310 food pantries across the state. In 2019, the AFB distributed 26 million pounds (11.8 million kg) of food to over 280,000 residents across 33 counties and estimated that nearly 300,000 people were considered food-insecure in 2021 (Arkansas Food Bank, n.d.-b).

Food pantries typically distribute food to clients in one of two ways: by using a prefilled bag or box of items (the traditional model) or by allowing clients to select some or all of their items (the client-choice model). The client-choice model can be implemented using several different options. These include the supermarket option (clients can shop as if they were at a store), table option (food items or groups are displayed on tables), inventory list option (clients select from a given list), points or color-coded option (items are assigned points/colors), and food weight option (clients can select a set poundage of food), among others (Akron-Canton Regional Foodbank, 2012; Indiana’s Emergency Food Resource Network, n.d.).

Client-choice pantries offer many benefits to the households they serve, who frequently prefer the ability to select their food items (Remley et al., 2010; Remley et al., 2019). Offering client choice gives clients more control and dignity over their food choices (Wilson et al., 2017), and has also been linked to a reduction in pantry and household food waste (Pruden et al., 2020; Remley et al., 2010). The nutritional value of food offered at client-choice pantries may also be higher compared to traditional pantries, due to clients requesting fresh food items (Bryan et al., 2019). Prior studies have also suggested that offering client choice can promote healthier choices (Remley et al., 2013; Wilson et al., 2017), has been linked to increased fruit and vegetable consumption (Martin et al., 2013), and has the potential to combat food insecurity (Remley et al., 2006).

In contrast to the client-choice model, tradi-

tional pantries may be associated with a variety of concerns. These include clients receiving items they do not need or will not use, and pantries wasting resources by stocking unwanted food (Remley et al., 2006).

Despite the benefits of client choice, traditional pantries remain the norm. This is especially true in Arkansas, with the AFB reporting that only 13% of its 310 active food pantries have offered client choice since 2018, despite efforts by the AFB to increase the number of pantries offering client choice. The various options of the client-choice model could be used to help reduce any perceived barriers and risks of conversion by pantry managers, such as concerns over inadequate storage space, and concerns over clients perhaps choosing foods that are lower in nutritional value. Identifying perceived barriers to client-choice conversion among pantry managers, as well as examining their interest in implementing a client-choice model, is an important first step toward increasing the number of client-choice pantries in operation.

The research is currently limited that identifies perceived barriers to client-choice conversion that food pantries might face. Wood (2020) examined barriers and benefits of pantries across the U.S. based on seven client-choice pantries surveyed. Similarly, Remley et al. (2006) focused on pantries in a single county in Ohio. No known study yet has conducted a statewide examination of perceived barriers to client-choice pantry conversion. Identifying barriers to client-choice conversion provides valuable information for state food banks, government agencies, and other public health and nutrition stakeholders involved with client-choice pantry initiatives, in Arkansas and other states across the U.S. The objectives of this study are to examine the feasibility of client-choice pantries through three areas: (1) identify the types of barriers that Arkansas food pantry managers consider to be impediments to adopting client choice, (2) examine whether clusters of pantries differ in terms of the types of barriers they find most concerning and their interest in converting to client choice, and (3) investigate whether clusters of pantries differ across demographic and operating characteristics.

Literature Review

Benefits of Offering Client Choice

According to Rowland et al. (2018), offering client choice allows food pantry clients the ability to choose foods that they prefer, rather than receiving items that they may dislike, are unable to consume, or cannot properly prepare. Food pantry managers often assume that clients can both adequately prepare and safely store the foods they receive, but this may not always be the case (Pritt et al., 2018). Lack of housing, appliances, and kitchen supplies can often affect clients' ability to consume the foods they receive. For example, if a client receives a can of food without a pull tab and lacks access to a can opener, they may not be able to consume the item. Giving clients a choice in the foods they receive better equips them to select items they can and are likely to consume. Client choice can also benefit the pantry as it gives the pantry the ability to track client food preferences, which can be useful for planning purposes and determining future food procurement (Remley et al., 2006).

Client choice may also benefit clients from a health and nutrition standpoint. Prior research by Bryan et al. (2019) found that client-choice food pantries often feature foods with a wider range of nutritional quality compared to more traditional food pantries. Long et al. (2020) concluded that client-choice pantries were more likely to offer healthier foods to their clients than pantries that did not offer any choice. While some pantry clients may prefer healthier foods, others may be concerned about the nutritional quality of the foods they receive due to health concerns. Remley et al. (2019) found that clients living with chronic health conditions often expressed a desire to be able to choose pantry foods based on their nutritional value or product ingredients. For pantry clients who are actively managing diabetes and/or other chronic health conditions, allowing some choice as to the foods received may help them accommodate any necessary dietary restrictions.

Potential Barriers to Client-Choice Conversion

Despite the potential benefits of client choice, there are also potential barriers to pantry conversion. Identifying and addressing these perceived

barriers to client-choice conversion is necessary for more traditional pantries to shift to client choice. One perceived barrier may be the availability of food items. Bush-Kaufman et al. (2019) encountered a food pantry administrator who stated that their pantry often receives “junk” that clients would not necessarily take if given a choice, suggesting that transitioning to client choice may lead to food waste being passed on to the client. Pantry layout may also be a perceived barrier to client-choice conversion. Long et al. (2020) found that inadequate refrigerator storage may be a barrier to the types of foods that can be offered, thus limiting food pantry offerings. However, the Akron-Canton Regional Foodbank (2012) offers suggestions to help address this, noting that pantries can promote the selection of foods with a short shelf life (such as fresh produce) by allowing clients to take as much as they prefer or by offering cooking demonstrations with food samples and recipe examples.

Increases in food waste brought on by increasing the amount and variety of fresh produce being offered may also be a potential barrier to conversion (Rowland et al., 2018), although Wilson et al. (2017) found that offering a client-choice model may lead to a reduction in food waste. According to The Ohio Association of Second Harvest Foodbanks (2016), implementing a client-choice model also can save money for the pantry, as it may help limit food waste. By allowing clients to select their own food, especially at pantries that only allow one visit per month, clients can select foods that complement the existing food items already in the household (The Ohio Association of Second Harvest Foodbanks, 2016). Whether food pantry managers perceive food waste as a potential barrier to client-choice conversion, though, is an area in need of further research.

In addition to food-related concerns, adopting a client-choice model may also affect pantry operations from a volunteer and staff perspective. Rowland et al. (2018) concluded that transitioning from a traditional model to client choice may be challenging: volunteers often need to be retrained, and the transition to client choice needs to be effectively communicated to all stakeholders. Remley et al. (2006) suggested that when transitioning from a traditional model to client choice, food pantry staff

and volunteers may have increased interactions with pantry clients. Such increased interactions may present a barrier to client-choice conversion due to their potential time commitment. However, as previously discussed, there are a various ways that client choice can be implemented; these variations in client choice may help alleviate some of these concerns. Identifying the types of perceived barriers to client-choice conversion that pantry managers find most concerning would provide useful information for those looking to shift traditional pantries toward client choice.

Applied Research Methods

Objectives

To examine the feasibility of client-choice pantries, the objectives of this study are to: (1) identify the types of barriers that Arkansas food pantry managers consider to be impediments to adopting client choice; (2) examine whether clusters of pantries differ in terms of the types of barriers they find most concerning, and their interest in converting to client choice; and (3) investigate whether clusters of pantries differ across demographic and operating characteristics. We hypothesized that there may be significant differences between pantry clusters in terms of the types of barriers that each cluster identifies as the most concerning. Food pantries in Arkansas often vary in terms of their operating characteristic, and such variations may result in differences in perceived barriers to client-choice conversion. We also hypothesized that there may be significant differences between pantry clusters in terms of their operating characteristics.

Pantry Manager Survey

To examine the above-mentioned objectives, the researchers collaborated with the Arkansas Food Bank (AFB) to conduct an exploratory mixed-methods survey of Arkansas pantry managers. The AFB serves as the state’s largest nongovernmental food aid provider, working with over 350 food pantries across the state. The survey featured questions concerning the feasibility of, and potential barriers to, offering client choice. Questions concerning the number of client households served, operational characteristics, and pantry demo-

graphics were also included.

Respondents were presented with 19 possible barriers to client-choice conversion and asked to rate on a 5-point scale how likely it was for each item to be a potential issue for their pantry. These barriers were developed in coordination with the Arkansas Food Bank and piloted by both AFB staff members and a small number of pantry managers in the AFB network. To help ensure that all possible barriers were identified, respondents were also presented with an open-ended question on perceived challenges and barriers to client-choice conversion. The survey took respondents 15 to 20 minutes to complete. The study protocol was approved by the university's Institutional Review Board for research on human subjects.

The final survey was distributed in spring 2021 to 366 Arkansas pantry managers via the Qualtrics survey platform, using an email list of pantry managers provided by the AFB. The survey had an overall response rate of 51% ($n=187$), with a 36% response rate on the open-ended questions. To incentivize participation, at the conclusion of the survey, 150 respondents were randomly selected to each receive a \$150 AFB account credit for their organization. Credits were added to the pantry's existing AFB account, allowing them to order and have delivered in-stock items. Pantries often prefer to purchase from the AFB as items are tax-free and deeply discounted compared to grocery stores.

Data Analysis

Factor and cluster analysis

To identify potential barriers to conversion, common factor analysis was conducted in Stata (version 17.0) to examine relationships between 19 possible barriers included in the survey. Factor loadings obtained from this analysis were used to identify perceived barriers that were correlated with each other. As noted by Gifford and Bernard (2008), factor analysis can be used as a confirmatory, rather than exploratory, technique when a priori hypotheses are made. Varimax rotation was used, and barriers with rotated factor loadings greater than 0.3 were retained. K-medians cluster analysis was next used to categorize respondents into distinct clusters based on their responses to

the perceived barriers identified in the common factor analysis. Comparisons between cluster groups in terms of the identified factors were also examined using a series of Wilcoxon rank-sum tests, with p -values corrected for multiple comparisons using Benjamini-Hochberg correction (Benjamini & Hochberg, 1995; Benjamini & Yekutieli, 2001; Newson, 2010).

Thematic analysis

Responses to the open-ended questions were coded and analyzed using a thematic analysis approach adapted from Braun and Clarke (2012). A series of themes and subthemes were then identified from the open-ended responses. Thematic analysis has been utilized in similarly designed studies. Helmick et al. (2021) previously used thematic analysis to understand the barriers to successfully implementing nutrition policies in food pantries across the United States.

Results and Discussion

Barrier Types Identified in the Factor Analysis

Of the 19 possible barriers to client-choice conversion that were included in the survey, 18 had rotated factor loadings greater than 0.4 (see Table 1). One barrier, which concerned possible language barriers between clients and pantry staff and volunteers, had a factor loading below 0.3 and was excluded. From the remaining 18 items, four barrier types were identified from the common factor analysis; together they account for 68.97% of the explained variance in the data, as shown in Table 1.

The first barrier type, "Food Supply Concerns," indicates that perceived barriers concerning the availability of food items, such as the variety and volume of food available, were highly correlated with each other. The second barrier type, "Limited Nonfood Resources," suggests that barriers focusing on nonfood resources, such as the availability of staff and volunteers, pantry operating hours, pantry budget, and wait time for clients, were correlated with each other. The barrier type "Food Waste Concerns" grouped together two barriers concerned with excess product and food waste. Lastly, the barrier type "Confusion and Nutritional Concerns" grouped together barrier

Table 1. Rotated Factor Loadings for Possible Barriers to Implementing a Client-Choice Model, by Identified Barrier Type (n=187)

Possible Barriers ^b	Identified Barrier Type ^a			
	Food Supply Concerns	Limited Nonfood Resources	Food Waste Concerns	Confusion and Nutritional Concerns
Not enough culturally appropriate foods available for clients to choose from	0.5146			
Inconsistency of available food items	0.7689			
General lack of inventory	0.6890			
Limited amount of donations	0.6200			
Variety of food available	0.8457			
Volume of food available	0.8447			
Longer wait times for clients		0.6247		
Lack of volunteers/staff		0.7596		
Limited pantry hours		0.9101		
Lack of shelving/physical space to display food options		0.4166		
Pantry operating budget		0.4730		
Uncertainty concerning how much excess product might be left over			0.9002	
Increased food waste			0.8188	
Some food groups having more items on the shelves than others				0.4436
Pantry volunteers/staff not understanding what a client-choice model is				0.5939
Additional training needed for volunteers/staff to implement				0.4430
Clients not understanding how to use/cook certain food items				0.6878
Lack of client understanding of basic nutritional concepts				0.7833
Explained variance, %	26.1570	15.8692	8.4568	18.4904
Cumulative variance, %	26.1570	42.0262	50.4830	68.9734

^a Factor loadings obtained from common factor analysis; factor loadings below 0.3 omitted.

^b 4-factor solution based on 18 of 19 possible barriers included in the pantry manager survey; possible barriers are ordered by identified barrier type.

items that were concerned about the nutritional implications of converting to a client-choice model and worries about client choice being confusing. These included concerns with clients not understanding basic nutritional concepts and certain food groups having more items displayed on the pantry shelves than others. Also included in this last barrier type were concerns about pantry staff and/or volunteers not understanding the client-choice model, pantry staff and/or volunteers need-

ing additional training to implement client-choice, and clients not understanding how to use certain food items.

Themes and Subthemes Identified from Open-ended Responses

Of the 187 survey participants, 71.1% responded to the open-ended question on perceived challenges and barriers to client-choice conversion. The themes and subthemes identified from these

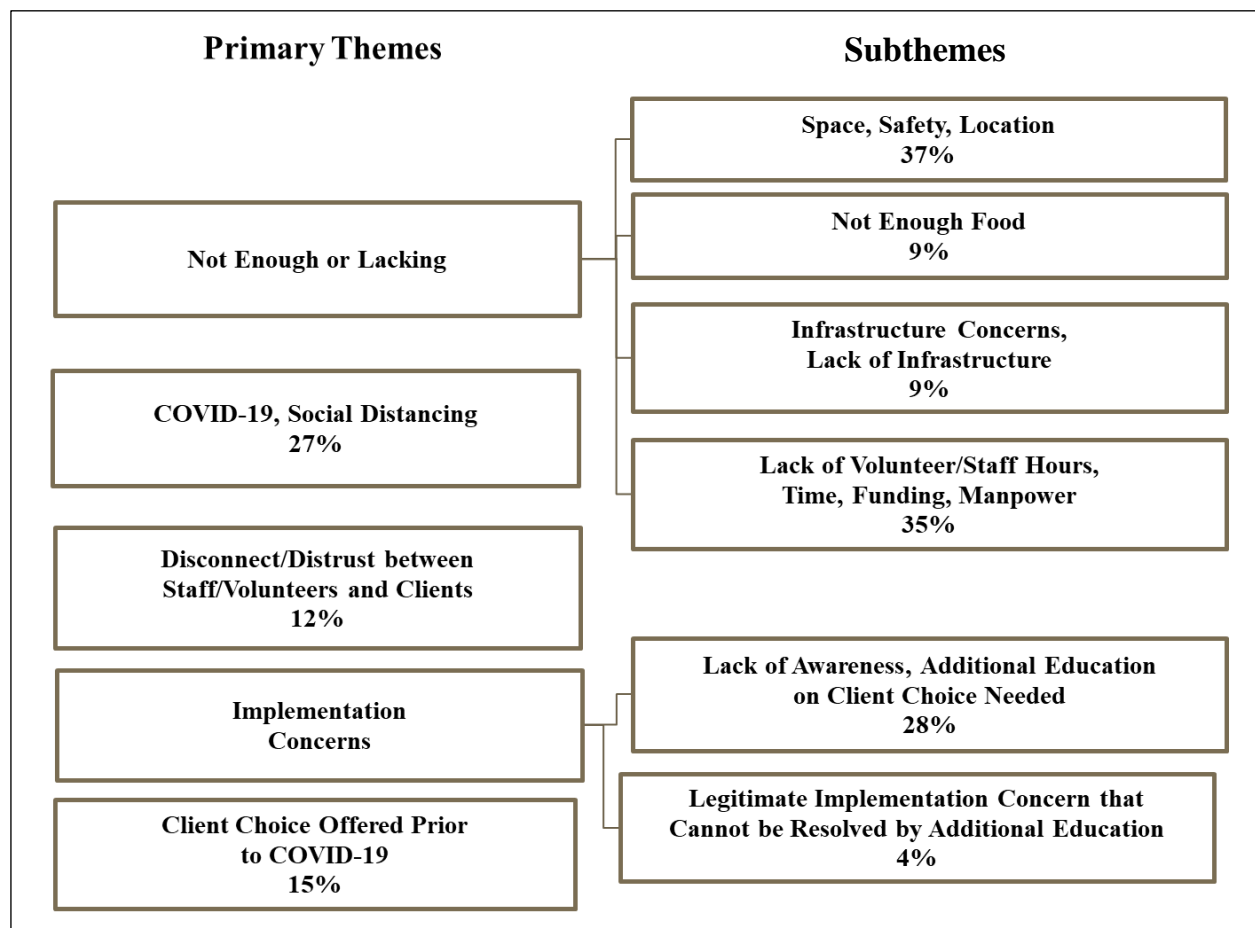
responses can be viewed in Figure 1. Five primary themes and six subthemes were identified. These included concerns related to pantry space and location (37%), volunteer and staffing needs (35%), lack of awareness concerning client-choice options (28%), COVID-19 concerns (27%), and perceived client greed and distrust (12%). Apart from COVID-19 concerns and perceived client greed and distrust, the themes and subthemes identified were related to the four barrier types identified in the earlier factor analysis.

Two perceived barriers to client-choice conversion identified from the open-ended responses were not included in the earlier factor analysis. These included concerns about a potential disconnect or distrust between food pantry volunteers and staff and pantry clients, which was identified in

12% of the open-ended responses. These responses mentioned a concern that clients might become “picky” or “greedy” if client choice was implemented. Some of these responses also mentioned concerns about the nutritional knowledge of clients.

The second identified barrier focused on COVID-19 and social distancing concerns, which were mentioned by 27% of the open-ended responses. The COVID-19 pandemic has been noted to affect client choice, as some pantries that previously offered client choice may temporarily use another model (Schoenfeldt, 2020). Some of the identified concerns seem to indicate that many pantry managers view client choice as having to have their pantry set up as a grocery store, where clients then shop. However, there are several dif-

Figure 1. Themes and Subthemes Identified from Open-Ended Responses, with Percentages (n=133)



ferent options for implementing client choice, and having the pantry set up to resemble a store is only one option (Akron-Canton Regional Foodbank, 2012; Indiana's Emergency Food Resource Network, n.d.). Other options for implementing client choice include allowing clients to choose items from a list, or color-coding items and allowing clients to select a set number of items from each color category.

Pantry Manager Clusters

Using the four barrier types identified in the factor analysis, cluster analysis was next used to segment pantry managers into distinct groups. The cluster analysis revealed three clusters of pantry managers, as shown in Table 2. The first cluster, "Potential Converters," consisted of 18.2% of respondents and had median scores below 2.0 for each of the identified barrier types, indicating that pantry managers in this group did not perceive any of the potential barriers as being an issue to them converting to a client-choice model. The second cluster,

"Confusion Concerned," consisted of 56.7% of respondents and had median scores below 3.0 for every identified barrier type except for the confusion and nutritional concerns factor, which had a median score of 4.61. This seems to indicate that for this group, potential barriers to conversion focus on concerns with client choice being confusing for clients, volunteers, and staff alike, as well as concerns about clients not having the nutritional knowledge to choose their own items. The last cluster of pantry managers, "Skeptics," consists of 25.1% of respondents and had median scores above 4.0 for each identified barrier type, indicating that managers in the cluster perceived all four of the barrier types as likely to be an issue in converting their pantry to a client-choice model.

Comparisons and Pantry Operating Characteristics, by Cluster

Non-parametric Wilcoxon rank-sum 2-sample tests were used to examine differences between pantry-manager clusters for each of the four identified

Table 2. Comparison Statistics for Median Identified Barrier Type Values and Interest in Client-Choice Conversion, by Cluster (n=187)

Identified Barrier Type ^b	Cluster ^a			Comparison		
	Potential Converters (18.2%)	Confusion Concerned (56.7%)	Skeptics (25.1%)	Potential Converters to Skeptics	Confusion Concerned to Skeptics	Potential Converters to Confusion Concerned
	Median (IQR) ^c	Median (IQR)	Median (IQR)	Benjamini-Hochberg Adjusted Rank-sum p-value ^d		
Food supply concerns	1.85 (0.64)	2.75 (0.84)	4.96 (0.65)	<0.001***	0.073*	0.378
Limited nonfood resources	1.63 (0.43)	2.17 (0.86)	4.41 (0.54)	0.046**	0.089*	0.885
Food waste concerns	1.36 (0.41)	2.43 (0.62)	4.36 (0.55)	0.009***	0.215	0.432
Confusion and nutritional concerns	1.88 (0.47)	4.61 (0.73)	4.93 (0.85)	0.014**	0.838	0.098*
Interest in Client-Choice Conversion ^e	4.82 (1.51)	3.97 (1.39)	1.70 (0.92)	0.028**	0.042**	0.419

^a Clusters obtained from K-medians clustering.

^b 4-factor solution obtained from common factor analysis; 5-point scale with 1=not at all likely to be a potential issue and 5=very likely to be a potential issue in converting to client choice.

^c Interquartile range in parentheses.

^d All p-values obtained from nonparametric Wilcoxon rank-sum 2-sample tests, and have been adjusted for multiple comparisons using Benjamini-Hochberg correction. Values in bold are significant at the 10%*, 5%** and 1%*** level.

^e 5-point scale with 1=not at all interested and 5=very interested in client-choice conversion.

barrier types. Since Shapiro-Wilk tests for normality indicated rejection of normality for all the barrier type comparisons between clusters, nonparametric tests were used. Benjamini-Hochberg correction was also used to control the false discovery rate and thus correct for multiple comparisons. Comparisons between clusters for the four identified barrier types can be viewed in Table 2.

Pantry managers in the Potential Converters cluster compared to the Skeptics cluster were significantly less concerned about all four barrier types being possible issues with client-choice conversion, with $p=0.046$ or better for all four comparisons. Pantry managers in the Confusion Concerned cluster were significantly different at the 10% level from the Skeptics cluster on two of the four identified barrier types: food supply concerns ($p=0.073$) and limited nonfood resources ($p=0.089$). Those in the Confusion Concerned cluster made up 56.7% of our sample, indicating that most pantry managers in Arkansas may be primarily concerned with food-supply issues and hav-

ing limited nonfood resources if their pantry were to consider converting to client choice.

Lastly, managers in the Confusion Concerned cluster were more concerned (significant at the 10% level) than managers in the Potential Converters cluster about the confusion and nutritional concerns barrier type ($p=0.098$). For both the Potential Converters and the Confusion Concerned clusters, the confusion and nutritional concerns barrier type had the highest median rating out of the four barrier types. Food-pantry stakeholders who educate and train pantries on how to implement client choice may benefit from focusing on ways to make offering client choice a simple process for clients, pantry staff, and volunteers alike. Outreach efforts focused on implementing client choice could also address any possible nutritional concerns that food pantries may have—such as clients selecting too much from any one food group.

The pantry operating characteristics of respondents are presented by cluster and in aggregate in Table 3. Overall, respondents served 254 clients

Table 3. Pantry Operating Characteristics, by Identified Cluster (n=187)

Demographic Characteristics	Cluster ^a			
	Potential Converters (SD)	Confusion Concerned (SD)	Skeptics (SD)	Aggregate (SD)
Client households served monthly	180.18 (174.49)	295.87 (464.10)	209.94 (230.39)	253.86 (378.42)
Number of days open to the public monthly	8.33 (10.53)	6.92 (6.51)	5.60 (6.36)	6.84 (7.30)
% of pantries with hours after 5PM	22.73% (42.89)	14.08% (35.03)	12.90% (34.08)	15.32% (36.17)
% of pantries with weekend hours	31.82% (47.67)	23.94% (42.98)	25.81% (44.48)	25.81% (43.93)
Total annual operating budget (in US\$)	\$15,524.30 (8652.20)	\$14,184.93 (8185.27)	\$10,365.80 (7026.02)	\$13,453.38 (8140.61)
% of food typically donated	38.33% (31.79)	31.49% (29.61)	35.53% (33.30)	33.70% (30.79)
% of food typically purchased	61.67% (31.80)	68.51 (29.67)	64.47 (33.29)	66.30 (30.80)
Number of volunteers monthly	8.90 (5.31)	15.96 (16.51)	12.27 (14.42)	13.82 (14.80)
Number of paid staff monthly	1.52 (2.80)	1.26 (5.34)	1.17 (1.80)	1.28 (4.30)
% of Respondents	18.2	56.7	25.1	100

^a Clusters obtained from K-medians clustering.

per month and were open seven days per month to the public, with 15.3% of pantries offering client hours after 5 pm and 25.8% of pantries open on the weekend. The total annual pantry operating budget of respondents averaged US\$13,453, with 66.3% of food purchased by the pantry. For all three clusters, a greater number of pantry volunteers (14 volunteers on average) compared to paid staff (one staff member on average) were responsible for distributing food to clients. No statistically significant differences were observed between pantry clusters for each demographic characteristic.

Conclusions

Our findings suggest that food-pantry stakeholders need additional outreach and education on how client choice can be implemented. Results also suggest that outreach efforts to convert traditional pantries to client choice should focus on alleviating concerns that client choice is confusing for pantry volunteers, staff, and clients alike. This includes providing additional training for staff and volunteers to understand and implement a client-choice model. Additional education efforts should focus on alleviating nutritional concerns, which can include making sure food groups are equally represented in the client-choice model, providing clients with information concerning basic nutritional concepts, and providing clients with information on how to use and prepare pantry food items.

Our study identifies a cluster of pantry managers who may be more receptive to converting their pantry to client choice. Efforts to convert traditional pantries to client choice should consider focusing on potential converters first, which can serve as an example and catalyst to other pantries in the state. Our results also have important implications for those involved in distributing food aid to food-insecure households. Professionals working with food pantries and food-pantry managers

can use the perceived barriers to client-choice conversion that were identified here to not only inform their educational programming, but also to inform how they interact with food-insecure individuals. Pantry managers and food banks alike can use this information to reflect on practices at their own pantries and determine how they can better serve their clients. Such efforts could focus on addressing the concerns of pantry managers around nutrition, as well as concerns that the client-choice model is too confusing.

Limitations and Future Research

Limitations of this study include a survey sample composed of only Arkansas food pantries. Future efforts should explore whether the types of perceived barriers identified here hold across other states in the U.S. Additional research could include examining the variations in the client-choice model that traditional pantries would be most willing to adopt, as well as awareness by pantry managers as to the benefits of client choice and various ways it can be implemented. Further research can also explore the implementation practices of the small number of food pantries in Arkansas that are currently utilizing client choice, the satisfaction of Arkansas clients served through a client-choice pantry, and the long-term impacts of the COVID-19 pandemic on client-choice implementation. Lastly, several open-ended responses mentioned a distrust of clients regarding clients' perceived ability to select the "right" foods under client choice. Exploring this potential disconnect between pantry volunteers and staff and the clients they serve could be key to improving the experience of pantry clients.

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Evaluating the successes and challenges toward achieving the Real Food Commitment at Johns Hopkins University

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Abstract

With their significant purchasing power, institutions of higher education can create substantial changes in the food system through their food purchases. The Real Food Challenge launched a national campaign in 2011 to shift food procurement at colleges and universities across the United States to local and community-based, fair, ecologically sound, and humane sources. In 2013, the president of Johns Hopkins University (JHU)

signed on to the Real Food Commitment, pledging to purchase at least 35% “Real Food” by 2020. Drawing on interviews with students, dining staff, and vendors as well as an analysis of purchasing data, this research analyzes the successes and challenges that JHU stakeholders encountered in their efforts to implement this commitment. Although the university fell short of achieving its goal of 35% “Real Food” procurement, JHU spent US\$4.7 million on local and community-based,

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J. Berger conducted the interviews with stakeholders and wrote the draft on which this paper was based as part of a senior capstone project. As stated in the manuscript, some authors of this article were involved in aspects of the JHU Real Food Commitment implementation. R. Santo was a leader of the Real Food Hopkins student group until 2014, served as a student volunteer on the national working group to develop an early version of the Real Food Standards from 2011 to 2012, and participated in JHU Food Systems Working Group meetings until 2020. I. Garces was a JHU Real Food Calculator intern (a paid position) from 2017 to 2020 and participated as an interview participant in the current study before later supporting compilation and verification of the quantitative data analyzed. Garces has also been an (unpaid) steering committee member of Real Food Generation since March 2021.

humane, ecologically sound, and fair foods between 2013 and 2019. Most of the university's successful procurement shifts focused on local and community-based foods and animal source foods. Challenges that hindered additional procurement shifts included the volumes and food preparation required by the university, student dining preferences, contracts that required purchasing from specific vendors, and staffing limitations. Lessons learned from the implementation of the Real Food Commitment can inform the evolution of sustainable and ethical food procurement standards at JHU as well as other universities and institutions.

Keywords

Local Food Systems, Sustainability, Food Service, Food Procurement, Real Food Challenge, Social Justice, Farm-to-Institution, Fair Trade, Animal Welfare, Higher Education

Introduction and Literature Review

Over the past few decades, a growing food movement has elevated attention to the socio-economic, environmental, health, and animal welfare harms associated with global food systems (Holt Giménez & Shattuck, 2011; Pollan, 2010). Concentration and consolidation along global food supply chains are associated with improved efficiencies and productivity, but have reduced farmer and consumer autonomy over food systems; pressured producers to minimize workers' wages and compromise occupational health and safety; and reduced resiliency to social, environmental, and economic disruptions (Asbed & Hitov, 2017; Hendrickson, 2015). Conventional industrial food production relies on techniques including monocropping, tilling, and the overuse of synthetic pesticides and fertilizers that degrade soils, pollute water, and threaten biodiversity, posing a direct threat to future food production (Foley et al., 2005; Frison & IPES-Food, 2016). Moreover, food production is a key driver of climate change, deforestation, and biogeochemical flows, compromising humans' capacity to stay within Earth's planetary boundaries (Conijn et al., 2018). The vast majority of animal foods available in the United States—and increasingly around the world—come from industrial operations in which livestock are raised in crowded indoor spaces. This

allows for higher production levels at minimal costs but compromises the quality of life for livestock and creates conditions conducive to the spread of disease (Moses & Tomaselli, 2017).

The local food movement, which seeks to reduce the distance between where foods are produced and consumed, has arisen as one response to reform the food system. By shortening supply chains and supporting small and mid-sized farms, advocates purport to improve trust, counter industrialization, and invest in local economies (Hinrichs, 2000). Some local food initiatives, including farmers markets and community supported agriculture (CSA), focus on direct marketing from individual producers to individual consumers. Others involve partnerships between farmers and restaurants or institutions, including schools, universities, hospitals, and government agencies (Brain, 2012).

Local food purchasing is not always feasible or desirable for all foods. In lieu of the accountability and transparency that can be conveyed when consumers have direct relationships with producers, third-party certification schemes have also arisen to identify producers who practice more environmentally sound, socially just, or humane practices. Organic certification is one of the most common certifications for sustainable growing practices, indicating that synthetic fertilizers and pesticides are not applied, genetically modified organisms are avoided, and crop rotations are practiced (Gomiero et al., 2011). Fair trade certifications and corporate standards programs, such as the Fair Food Program, identify companies that improve wages and working conditions for producers and workers (Asbed & Hitov, 2017). Other certification schemes recognize livestock producers that reduce unnecessary harm and suffering, promote physical and mental health, and allow animals to perform natural behaviors, such as allowing a grazer to graze (Appleby, 2005).

Institutional Food Procurement

With their significant purchasing power, institutions (including schools, hospitals, government agencies, and colleges and universities) have become key consumers of local and third-party-certified foods, seeking to drive systemic changes in the food system through their procurement poli-

cies (Santo & Fitch, 2018). Shifting institutional food procurement is limited in scope and scale compared to federal policy interventions but can influence the supply chains, infrastructure, and knowledge necessary for sustainable, ethical, and local food production (Porter, 2015).

In the higher education sector, procurement of sustainable, ethical, and local foods has grown significantly, motivated by student demand, public relations, and the desire to improve food quality on campuses (Murray, 2005). The national Real Food Challenge was established in 2008 as a student-driven movement for food justice, inspired by the anti-apartheid divestment movement (Steel, 2018). Recognizing that institutions of higher education in the U.S. purchased around US\$5 billion of food each year, the organization launched the Get Reall Campaign in 2011, with the goal of shifting 20% (approximately US\$1 billion) of the dining budgets at colleges and universities to “Real Food” by 2020. The Real Food Challenge defined “Real Food” as food that qualifies in at least one of four categories: local and community based, fair, ecologically sound, or humane. The Real Food Challenge Standards 2.1 detail specific criteria for each category, developed by a team of student leaders and professional advisors in consultation with over 100 food systems stakeholders (Real Food Challenge, n.d.-c). Foods are disqualified from counting as “Real” if they are sourced from a producer that used forced labor or had been cited for labor violations within a certain time period, produced on a concentrated animal feeding operation (CAFO), or are foods made with genetically engineered ingredients or other ingredients that classified them as ultraprocessed (Real Food Challenge, n.d.-c).

As part of the campaign, students advocated for their individual colleges and universities to commit to procuring at least 20% “Real Food” by 2020, but some institutions made more ambitious commitments ranging from 25–40%. The Real Food Commitments also sought more transparency in the institutions’ food systems, and student and community engagement. By 2020, 43 individual colleges and universities and four statewide university systems had signed Real Food Commitments, representing more than US\$80 million a year in committed shifts toward “Real Food”

sources (Real Food Challenge, n.d.-a).

The Johns Hopkins University (JHU) signed on to the Real Food Commitment in December 2013, committing to purchasing 35% “Real Food” by 2020 (Rosen, 2013). This effort was in part due to the advocacy of the student organization called Real Food Hopkins, an independent campus group created with inspiration from and in loose connection with the national Real Food Challenge. Following the signing of the Real Food Commitment in 2013, JHU Dining purchases were evaluated every year by “Real Food Calculator” interns. The interns researched the origins of food purchases and determined whether the food qualified as local and community-based, fair, ecologically sound, or humane, using Real Food Challenge standards. The interns analyzed the data to determine what percentage of JHU food purchases from certain dining halls qualified as “Real Food,” termed the Real Food Percentage. Interns also researched potential “Real Food” suppliers and met with staff of JHU Dining and Bon Appétit Management Company (BAMCO), the subcontractor in charge of dining purchases, to suggest reasonable shifts in the budget to increase the Real Food Percentage (Rosen, 2013).

Limited research has evaluated the Real Food Challenge nationally or at individual institutions. Previous research on the Real Food Challenge has focused primarily on institutions before they have committed to the procurement policy. Porter (2015) explored student demand for “Real Food” at the University of Vermont and a willingness to pay a premium for it. Several student projects, including unpublished theses, examined opportunities or barriers to adopting the Real Food Commitment (Baldwin, 2017; Kington, 2015) or procurement shifts inspired by the Real Food Challenge (Burley et al., 2016) at individual universities. The Real Food Challenge published a preliminary impact report that evaluated the impacts of food procurement shifts as of 2018 across Real Food Commitment signatory institutions (Real Food Challenge, n.d.-d) and published updated, though limited, summary statistics on its webpage in 2020 (Real Food Challenge, n.d.-b). Apart from the university-specific Real Food Commitment, a growing body of research has examined the effects of food

procurement shifts at other institutions, including hospitals, K-12 schools, food banks, and government agencies (Thottathil & Goger, 2019). To our knowledge, there has not been a formal evaluation of the successes and challenges of implementing the Real Food Commitment from its inception to its conclusion.

This research provides the first longitudinal study of the implementation of the Real Food Commitment at an individual institution by assessing the processes and impacts associated with shifting JHU food procurement purchases from 2013 to 2020. We begin by analyzing the university's Real Food Calculator data over the years following the commitment, looking at the Real Food Percentage over time and how qualifying foods were distributed among different "Real Food" categories and food groups. We then present a thematic analysis of semi-structured interviews conducted with former Real Food Calculator interns, Real Food Hopkins members, JHU dining staff, BAMCO staff, and vendors of "Real Food" to explore the perceived successes, challenges, and lessons learned from the implementation of the commitment. The discussion contextualizes these results in relation to other research on institutional food procurement and explores potential future directions for institutional food procurement shifts aimed at building a more sustainable and ethical food system.

Methods

Calculations of "Real Food"

Data on JHU dining purchases were collected by members of the student group Real Food Hopkins for the 2012/13 school year and then by paid Real Food Calculator interns with JHU Dining Services from 2013 to 2020. The data for the 2012/13 school year reflected only purchases in one dining hall, the Fresh Food Café, on the university's primary academic and administrative campus (Homewood). Data for all other years, from 2013 to 2019, reflect purchases in three dining halls on the Homewood campus: Fresh Food Café, Nolan's on 33rd, and Levering Kitchens and Café. The data exclude food purchases for other eateries on Homewood Campus, university catering services,

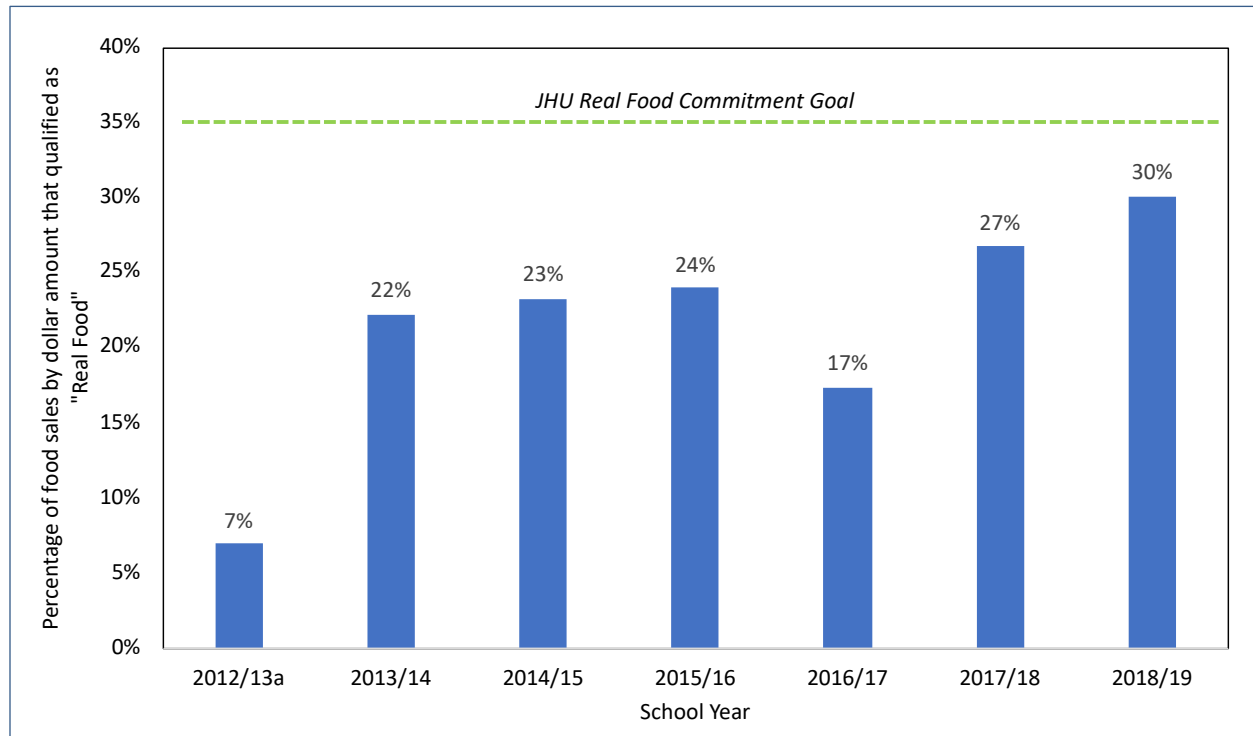
or the campus convenience store (Charles Street Market). It also excludes purchases from other university divisions, including the medical institutions campus. Dining hall purchases were analyzed by the students or interns to interpret whether they qualified as "Real Food" according to the Real Food Challenge standards. There is no data available for the 2019/20 school year due to the inability of students to view and analyze invoices (which were predominantly on paper) in person during the COVID-19 pandemic. The percentage of "Real Food" by money spent was then quantified by these interns; the numbers are summarized in Figure 1, tracking the Real Food Percentage at JHU over time. The time-intensive process of researching and classifying every product on an institution's dining invoices makes it infeasible within the capacity of most universities to analyze purchases from an entire school year. To derive a Real Food Percentage for each school year, the national Real Food Challenge recommends averaging the results from an analysis of purchases from two months (one in the fall and one in the winter) to reflect the extremes of seasonal availability for local food. The forthcoming JHU data reflect averages from September and February each year. Average "Real Food" purchases broken down by "Real Food" category and food type are summarized in Table 1 and Figure 2, respectively. The supplementary data file (linked to this article's abstract page online) provides summary data from each year. The estimated total amount of money spent on "Real Food" purchases across all years was derived from an extrapolation of the average amount spent on "Real Food" in two months of each school year.

Semi-structured Interviews

Semi-structured interviews were conducted in November and December 2020 with six former JHU students, three JHU dining department and BAMCO staff members, and four food vendors who sold produce, ice cream, coffee, and preprepared foods to JHU. An additional eight interview requests were sent out without response. Participants were selected using purposive sampling; recruitment aimed to target student leaders and the dining department and BAMCO staff who helped implement the JHU Real Food Commitment from

Figure 1. Real Food Percentage at Johns Hopkins University Homewood Campus, 2012–2019

Figure 1 shows the percentage of the university's food procurement budget that was spent on "Real Food" for each school year of the Real Food Commitment. Although the 2019/20 school year was part of the JHU Real Food Commitment, data were unavailable due to the premature ending of the school year during the COVID-19 pandemic.



^a The 2012/13 data reflect historic estimates from one dining hall made by Real Food Hopkins students through a Real Food Calculator trial before the Real Food Commitment was signed in December 2013.

Table 1. Spending on "Real Food" by the Real Food Challenge Categories, 2013-2019

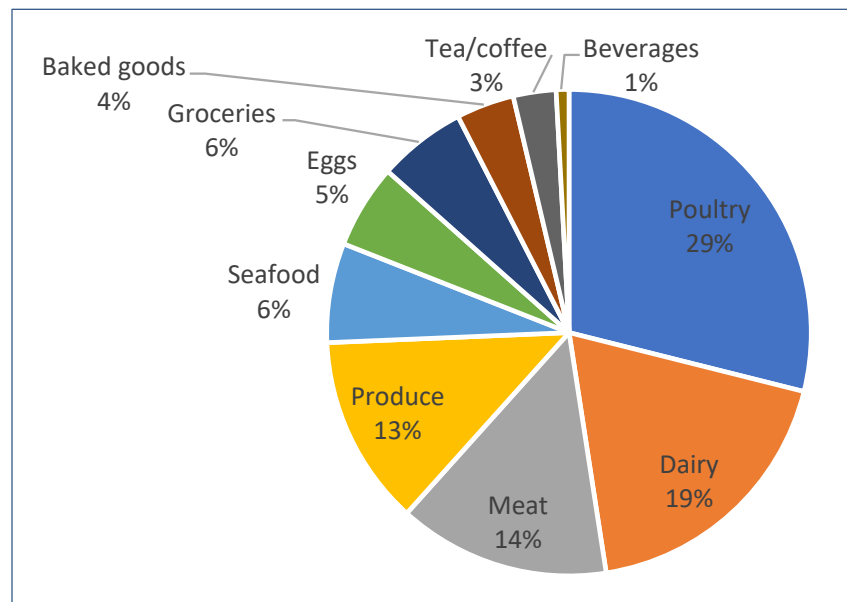
	Average Real Food Percentage of all foods purchased by Real Food Challenge category	Percentage of "Real Food" purchases by Real Food Category ^a
Local and community-based	18%	76%
Humane	5%	20%
Ecologically sound	4%	17%
Fair	0.3%	1%
Total across categories	24%	

^a These percentages add up to over 100% because some foods qualified for more than one Real Food category.

2013 to 2020, as well as vendors who sold a variety of products to JHU. The Johns Hopkins Homewood Institutional Review Board reviewed and acknowledged this study protocol as "exempt."

After the participants agreed to an informed consent form, the interviews were all audio recorded using the voice memo application on an iPhone, except for one food vendor who preferred to participate without being recorded (detailed notes were taken during this interview for later analysis). The interview questions, which can be found in the Appendix, were designed to elicit participants' opinions on their experiences with the Real Food Commitment implementation at JHU, including the successes, challenges encountered, and lessons learned. The audio recordings were manually transcribed and analyzed to identify

Figure 2. Average Percentage of “Real Food” Purchases by Food Type, 2013–2019



common themes among the experiences of various stakeholders in the JHU Real Food Commitment from 2013 to 2020.

Author Positionality

Some authors of this article were involved in aspects of the JHU Real Food Commitment implementation, supporting this research through a participatory-action research framework (Danley & Ellison, 1999). J. Berger conducted the interviews with stakeholders and wrote the draft on which this paper was based as part of a senior capstone project. R. Santo, who was a leader of the Real Food Hopkins student group until 2014 and participated in JHU Food Systems Working Group meetings until 2020, contributed to and advised throughout the development of the study conceptualization, design, analysis, and write-up. I. Garces, who was a JHU Real Food Calculator intern from 2017 to 2020, participated as an interview participant and later supported compilation and verification of the quantitative data analyzed.

Results

Procurement Shifts at JHU Over Time

Following the signing of the Real Food Commit-

ment in December 2013, JHU increased the proportion of its budget spent on local, sustainable, and ethical foods by over 20%. Over the six school years that official calculator data was available, 2013/14–2018/19, an estimated total of US\$4.7 million was spent on “Real Food.” On average, 24% of dollars spent on dining procurement each year was classified as “Real Food.” In the final year of the commitment with available data, the university procured 30% “Real Food” (Figure 1).

Most of the university’s “Real Food” purchases came from the local and community-based category (Table 1). An

average of 18% of all food purchases across the six years analyzed met local and community-based criteria, making up 76% of total “Real Food” purchases. Approximately US\$3.6 million was invested into the local economy over this period. An average of 5% of all food purchases were classified as humane, 4% as ecologically sound, and less than 1% as fair.

Nearly three-quarters of the university’s “Real Food” purchases from 2013 to 2019 came from animal source foods. Poultry made up the largest percentage, accounting for an average of 29% of “Real Food” expenditures, followed by dairy, meat, produce, seafood, and eggs (Figure 2).

The following subsections provide additional details useful for interpreting this data.

Food service provider

The university switched from Aramark to BAMCO as its food service provider between the 2012/13 and 2013/14 school years, which led to a substantial increase in the Real Food Percentage between those years. BAMCO has its own ethical food procurement standards (Bon Appétit Management Company, 2016) that align similarly with the Real Food Challenge standards for many foods. Many interview participants involved in the early stages

of implementation said that switching to BAMCO was crucial to the implementation of the Real Food Commitment at JHU. One former student from that time reported,

We had good working relationships with the Aramark staff that were based at Hopkins, but in terms of the corporate structure, they didn't necessarily have the power to make a lot of the kinds of sourcing changes that we knew we were going to be looking for. So I think the feeling was generally that Bon Appétit, the way it was structured, gave their employees who were based at universities more power to make those kinds of sourcing decisions and was less prescriptive in terms of the foods that had to be ordered.

Students involved in the implementation during that time reported that it was clear that BAMCO was more willing to work towards the Real Food Commitment than Aramark, based on what they had heard about student experiences at other universities. One former student also cited other reasons for the switch outside of pursuing the Real Food Commitment, such as student dining choices and cost. Although the Real Food Commitment was signed midway into the first school year after the switch to BAMCO, this switch helped boost the university's chances of achieving the Real Food Commitment.

Labor citation associated with chicken vendor

The drop in the Real Food Percentage in 2016/17, followed by a large increase the following school year, occurred due to a labor citation associated with the processing facility of the university's primary vendor of unprocessed chicken, which had previously qualified as local and community-based. Specifically, the processing facility was cited by the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) for poor hazard communication and machine maintenance training for workers. Due to the nature of the incident, the vendor was disqualified from being considered "Real" for one year, as per Real Food Challenge protocols. This vendor and this incident were one of the most discussed themes in the interviews.

"Low-hanging fruit"

A common theme in the interviews was the idea of so-called "low-hanging fruit" and "high-hanging fruit," referring to the ease or difficulty of making certain procurement shifts. Many participants emphasized that it was relatively easy to make large switches for certain products, such as chicken, dairy, and eggs, because there were qualifying vendors available for these products at a competitive price. It was relatively harder to make changes to other products, such as bananas and soda; these high-hanging fruits are discussed later in this section. Generally, products that could not be sourced locally—or were far more expensive to source locally or with other criteria (e.g., ecologically sound, fair, humane)—were more challenging to shift. Overall, the data reflect initial successes in shifting toward low-hanging fruit, followed by a slowing of growth as the university worked more on high-hanging fruit.

Successes

While the growth in the Real Food Percentage illustrates the university's most obvious success, former students discussed various successes in specific food procurement shifts during their time working on the Real Food Commitment. The JHU dining department and BAMCO staff members (henceforth referred to as dining staff) focused on successful shifts and the growth of the Real Food Percentage. Dining staff and vendors also emphasized the growth of local small business partners.

Growth of Real Food Percentage over time

Reaching 30% "Real Food" represented a notable accomplishment for JHU despite falling short of the 35% goal set for 2020. Multiple interview participants mentioned the success of reaching the milestone of 20% "Real Food," which was the original commitment established by the national Real Food Challenge and the most common goal for other colleges and universities.

Operational changes

One factor that contributed to the successful shifts was that the JHU dining department standardized food procurement across all dining facilities on campus, which made food procurement shifts

much easier to implement. A former student explained that while individual chefs at each dining hall still selected their own food purchases, they had to choose from a standardized list or, in some cases, a particular vendor of that product.

Food Systems Working Group

Multiple participants noted the creation of the Food Systems Working Group as an accomplishment. A standard component associated with signing the national Real Food Commitment, this group was created so that all the stakeholders in the JHU food system could meet every semester, including dining department staff, BAMCO staff, dining hall workers, “Real Food” vendors, calculator interns, Real Food Hopkins members, and students who eat in the dining halls. Discussing goals and implementation strategies at Food Systems Working Group meetings was critical in ensuring all voices were heard in working towards the Real Food Commitment. One former student emphasized that these meetings were especially important for local businesses to meet the dining staff and build partnerships with each other. While attendance at these meetings and communication between different stakeholders was not perfect (i.e., the meetings did not solve all communication challenges), the Food Systems Working Group was seen as a useful tool for implementing the Real Food Commitment.

Growing local businesses

When vendors were asked about successes in their relationship with JHU, all four reported an increase in sales, and three responded that the partnership had helped expand their business. One vendor said,

I can’t complain about anything. ... For us, for our company, it changed everything. ... It made a huge difference for our company. And the relationship with Bon Appétit has been fantastic.

The relationship with BAMCO allowed many vendors to branch out to numerous institutional partners. A dining staff member explained that:

When those companies grow, they’re then able to do their own things to support the local community, and they become these support networks for other small businesses. So, the trickle-down effect, I don’t think we understand the true impact of it because it’s probably much bigger than we ever appreciated.

All three dining staff members reported the success of helping small businesses grow. One vendor was able to expand their business to include different social initiatives such as jobs and skills training for veterans, at-risk youth, people with disabilities, and formerly incarcerated people because of the partnership with JHU. Multiple vendors also felt that partnering with a large institution helped them stabilize their business model. For example, a business selling ice cream could maintain sales during the winter. Another farmer reported that the institutional partnership allowed them to plan where to sell excess produce that could not be sold through other venues.

Educational opportunities for students

Participating in the implementation of the Real Food Commitment provided valuable educational and career development opportunities for students. Several former students shared their experiences learning from and networking with students from across the country and region who were facing similar challenges by attending and hosting Real Food Challenge conferences. A critical component of success over time was the students’ ability to pass the baton to new leadership and to empower new members, a difficult and important task for college campus organizing. Dining staff members also emphasized the ability to mentor students and increase awareness around the importance of consumption choices and “Real Food” procurement.

Challenges

When asked about challenges they faced, interview participants had many similar responses. Some responses identified structural challenges with university procurement requirements, while others focused on specific barriers to procurement shifts at JHU.

Requirements of university food procurement

Of the broader structural challenges, interview participants most commonly discussed how small, local, and sustainable farmers and vendors do not have the capacity to meet the demand of a large institution like JHU. Two dining staff members told the same story of a partner for salad greens who could not meet the need, and the partnership ended. However, when a different vendor was asked about limits to local vendor capacity, he claimed that this was “an excuse.” In fact, this farmer felt confused as to why JHU was not ordering more produce from his farm. He also emphasized that it could not be because of his prices because he had asked JHU what to charge for his produce.

Several interview participants mentioned how food procurement at universities is not built for vendors of “Real Food.” For example, universities prefer pre-cut and washed produce, but small vendors do not have the capacity to prepare food due to onerous regulations related to food safety and the need for on-site processing infrastructure. While more dining workers could be hired to prepare local produce, some interview participants said that the additional labor costs for the university associated with such preparations represent a large barrier. The seasonality and uncertainty of local produce availability posed a unique challenge for local farmers competing with large food distributors that source from all over the world and can guarantee the product. Similarly, one farmer reported that local farms require certainty in their contract and orders ahead of the season to know how much to plant.

Another related challenge stemmed from the university’s expectations of satisfying student demand, especially since meal plans are required for undergraduates. Some former students reported they had been told by BAMCO that certain shifts could not happen because of student dining preferences. For example, students want chicken tenders, which are only sold by large food processing companies that do not qualify as “Real,” such as Tyson Foods. Similarly, BAMCO standards require serving certain foods, such as cantaloupe, which could not be sourced feasibly or affordably to qualify under Real Food Challenge standards.

These examples highlight how institutional food procurement requirements may inherently conflict with local, sustainable, or ethical food procurement goals.

Staffing limitations

Some interviewees identified challenges specific to the experience of implementing the Real Food Commitment at JHU through student interns and dining staff. One commonly cited challenge suggested that the calculator work was simply too demanding for full-time students to handle. Some former students also said they struggled to provide actionable insights from the data they compiled.

Dining staff turnover also limited progress. Many interview participants found the former dining director to be an active advocate for “Real Food” in the dining office. Multiple students and vendors mentioned that his departure from JHU in 2017 slowed progress toward the Real Food Commitment and hindered communication between students and staff. Three students used the word “frustrating” in their responses, all of whom were present during and after the former dining director’s departure. Whether due to the change in leadership or failed campaigns for high-hanging fruit, former students from recent years were more disillusioned with their ability to implement impactful food procurement shifts. Similarly, the high turnover rate among BAMCO staff made it hard for vendors and students to form the personal relationships with the dining staff required to implement procurement shifts.

Failed shifts and rebate pricing system

Some interviewees focused on failed campaigns to make certain procurement shifts. As aforementioned, participants explained that low-hanging fruit was prioritized as a way to easily and quickly make substantial shifts in the Real Food Percentage. However, some of these participants felt that prioritizing low-hanging fruit allowed the university to avoid the most difficult procurement shifts.

One of the most frequently discussed and most difficult procurement shifts attempted related to the failed effort to source from a sustainable soda vendor. Soda offers a clear example of a high-hanging fruit due to the size, length (seven years),

and donations (US\$2 million) associated with the exclusivity contract with PepsiCo, which requires that 80% of all beverages sold on campus are manufactured by the company (Malcom, 2019). One vendor also mentioned being an advocate against soda contracts. Many students brought up “kick-backs” as a barrier in relation to the PepsiCo contract and other partnerships, whereby large companies offer dining management contractors rebates as incentives for buying a high percentage of a product from their company, making it difficult for small producers to compete.

Former students also brought up the failed campaign to obtain fair trade bananas. The only vendor that offered fair trade bananas, Equal Exchange, had a minimum volume requirement for purchases that could not be met by the university alone. The students attempted to partner with local grocery stores and other institutions to buy the bananas in bulk, but this initiative was unsuccessful.

In another example, several students and dining staff members told the same story about a local bakery whose products did not qualify as local and community-based according to Real Food Challenge Standards because its flour was not sourced locally. These interview participants felt that JHU should support local businesses and that not counting this bakery disincentivized an investment in the local economy.

Former students also reported occasions where they would find suitable shifts but were told “no” for various reasons. Similarly, they felt frustrated when a partnership or Real Food vendor was terminated by dining staff members without communicating with the students about it.

Minimal challenges for vendors

Notably, three of the four vendors interviewed said that there were no challenges and felt strongly about the partnership between their business and JHU.

Lessons Learned

Discussions on the lessons learned from the commitment implementation touched on criticisms of the Real Food Challenge and potential directions for future food procurement commitments at JHU.

Another theme in these discussions identified the role of JHU in supporting the local food system.

Lessons about the food system

Interviewees highlighted how university dining is set up to reflect the industrial system of food production and distribution. While this system harms the environment, farmers, workers, animals, public health, and community food sovereignty, it provides consistent and large quantities of cheap food. The trend toward the concentration and industrialization of farming pushes out small, sustainable, and ethical producers, and thus reduces the availability of foods from them. A more recent trend toward preparing produce for serving in university dining halls (e.g., pre-cut produce) accelerates this harmful process. One former student explained that to support the local food system, university dining must change its expectations that can only be met by industrialized agriculture. She explains,

The food system ... is inherently messy, except when we try to corporatize it ... then it becomes this ugly thing with the same ten things over and over again in different iterations. ... If we want a food system that works for everyone ... we have to be more comfortable adapting to different situations and change ... and that needs to be true on college campuses too.

Interviewees also mentioned the profit motive as an obstacle to changing the food system. For example, BAMCO is restricted from paying workers more and from making more shifts in procurement because they ultimately need to make a profit. In contrast, a self-operated dining system may only need to break even rather than profit. Additionally, grassroots movements such as the Real Food Challenge are limited by larger policies that dictate how contracting works, the kinds of rebates that are allowed, and the agricultural subsidies that incentivize certain farming techniques and products over others. As one former student alluded to, federal policies largely subsidize the industrialization of agriculture rather than smaller farms and urban agriculture. While institutional procurement policies can raise public awareness around the need to

shift to a more sustainable, ethical, local, and humane food system, broader public policy changes are needed.

Lessons about food procurement shifts

To make progress on food procurement shifts, interim targets and enforceable commitments are necessary. Many interview participants also expressed how difficult choices need to be made between the different food procurement goals and standards. In many cases, it was unclear what should be prioritized among fair, local, humane, and ecologically sound criteria, and if low-hanging fruit should be prioritized or if foods and vendors that would be considered the most harmful (such as foods that would be disqualified by Real Food Challenge standards) should be targeted first. The value of long-term relationships in shifting institutional food procurement was also emphasized. Sustaining such relationships can be particularly difficult for individual college students, who are usually only temporary stakeholders in a university food system. The partnerships that were made had value beyond financial metrics because stakeholders felt better about the work they were doing and the food they were consuming. Students also shared that they had learned their unique power and responsibility to make an impact as clients of a university, especially compared to policy changes at other levels.

Criticisms of the Real Food Challenge

Interview participants shared criticisms of the Real Food Challenge national standards, as well as criticisms of the specific implementation at JHU. One concern specific to the JHU Real Food Commitment was that it did not engage dining workers enough. As important stakeholders in the university food system, dining workers' needs and voices should be prioritized going forward. Speaking of the Real Food Challenge national standards more broadly, participants expressed frustration that supporting local businesses was not always credited because products from local businesses did not count as local and community-based if their ingredients were not grown locally. This concern emerged primarily with local food products processed in some way, such as baked goods.

Role of JHU in supporting local food system

When vendors were asked about the role of JHU in supporting the local food system, all four stressed the importance of supporting local businesses, which puts money into the local community and creates jobs. One vendor who purchased most of their ingredients locally emphasized that partnerships with local farms are important, and large institutions should either partner directly with farmers or negotiate with larger food distributors to source their food from local farms. One vendor also explained that partnerships between JHU and small local vendors had to be two-way partnerships. JHU must be sensitive to the risk of a large institution putting pressure on a small company to grow or change. One vendor stressed the importance of institutions partnering with vendors oriented toward supporting low-income communities and communities of color rather than just supplying high-end farmers markets.

Future directions for food procurement at JHU

Both former students and dining staff provided several suggestions for future directions of food procurement commitments at JHU. One idea was introducing targeted percentages for each category of "Real Food," developing unique standards and goals for each value. Multiple students suggested hiring a full-time staff member to coordinate sustainable and ethical food procurement as a solution to the limits of student interns coordinating calculator work, vendor research, and outreach. When asked about this idea, former and current dining staff understood the suggestion but would not necessarily prioritize a new position for food procurement shifts, given the dining program's already-limited financial resources. Others mentioned the Real Food Challenge's new Real Meals Campaign, which targets the three major national food service providers directly rather than individual institutions. Many participants stressed that there should be more of a focus on procuring foods from businesses owned by women and people of color and including local businesses in their commitments, even if they did not necessarily use local ingredients.

A manager of dining programs elaborated on the current plans for future food procurement

commitments. The dining department has been building its own metric dashboard inspired by the Real Food Challenge since January 2020. He explained that the Real Food Challenge has a national lens and he would prefer that goals be more tailored to JHU's local context. For example, there is not a reliable local fish market near Baltimore, but local fish would be easy if the institution were in Seattle. Therefore, the dining department wants to build its own challenging but realistic goals. They also want to include food procurement goals as part of a broader picture of local, sustainable, and ethical commitments, including maintaining facilities sustainably, valuing local workers,¹ and measuring and reducing waste. When asked how to ensure accountability and avoid concerns of greenwashing related to creating their own metrics, he explained that other JHU affiliates outside of the dining department, including those from the Johns Hopkins Bloomberg School of Public Health, Center for a Livable Future, and Office of Sustainability, along with supply-chain experts in the division of procurement, could hold the program accountable. They were also working with undergraduate interns in the Office of Sustainability to determine new food procurement targets and whether they should be more or less specific. He hopes that students will be informed about the new goals and included in the process of implementation. In discussing the idea of JHU creating its own targets, one former student felt that the idea could address the shortcomings of the Real Food Challenge standards. However, she also expressed caution in allowing JHU to create its own standards due to the risk of the university giving itself excessive credit without implementing impactful and positive changes to its food procurement. She also raised a concern about the ability to compare JHU's progress to that of other campuses if individualized procurement standards are adopted.

While initial discussions of the development of post-Real Food Commitment goals and metrics occurred in early 2020, several factors have delayed further development and implementation. The COVID-19 pandemic instigated immediate pivot-

ing into emergency operations while the campus operated in virtual or hybrid mode for over a year. During that time, efforts to source and track "Real Food" were paused, as was other longer-term planning. Additionally, during the editing of this publication, JHU announced its plans to not renew its contract with BAMCO and instead to create a self-operated dining model without a third-party food service management company (Limpe, 2021). Real Food Hopkins members had advocated for such a shift, in line with a broader national trend that has spun off from the Real Food Challenge. This movement has begun challenging the corporatization of the food system by seeking to move campus dining services away from the three dominant food service companies (Anderson, 2021). That said, the university's decision took the students by surprise. During the editing of this publication, the university was preparing to launch its self-operated dining service in July 2022 and hiring its first-ever dining sustainability manager. A re-formed Sustainable Food Working Group had recently begun meeting to make short-term recommendations for the self-operated dining operations and longer-term recommendations to be included in the JHU Sustainability Plan being prepared for release in 2023. How the university maintains and refines its standards around sustainable and ethical food procurement and the extent to which it engages students in defining these standards as it transitions out of the formal Real Food Commitment and from BAMCO to a self-operated dining model remains to be seen. That said, the continued vigor and advocacy of the Real Food Hopkins student group, as well as the prioritization of sustainable food and dining in recent hiring and universitywide planning decisions, suggest that the university's experience implementing the Real Food Commitment has centered sustainable and ethical food procurement as a core value of the dining program and university at large.

Discussion

Johns Hopkins University's efforts to implement the Real Food Commitment occurred as part of a

¹ The university has a broader HopkinsLocal initiative that focuses on increasing hiring from specific neighborhoods with high unemployment or high poverty that are located near JHU campuses.

larger national movement focused on transforming institutional food procurement to be more local, healthy, sustainable, and ethical (Thottathil & Goger, 2019). Although research on other universities that participated in the Real Food Challenge is limited, the value of creating working groups consisting of stakeholders in a university food system to discuss dining procurement decisions has been explored by other researchers. These working groups can facilitate robust communication among students, faculty, staff, dining services, and community stakeholders, particularly by giving students a more permanent voice in procurement policy-making (Kington, 2015); dedicating spaces to deliberate about dining contract recommendations, prioritizing specific shifts, and other procurement decisions (Porter, 2015); and providing opportunities for integration with university education objectives (Porter, 2015) and campus event programming (Baldwin, 2017). JHU stakeholders echoed these reflections in discussing the value of the Food Systems Working Group established to implement the Real Food Commitment, while also acknowledging opportunities to improve communications about the termination of some “Real Food” contracts and whether and how certain categories were prioritized.

The Real Food Challenge’s broad approach to encouraging procurement across all “Real Food” categories, without specific targets for each category, added an element of ambiguity and inconsistency in implementation across campuses. Compared to the national averages, JHU procured a substantially larger percentage of its “Real Food” purchases from local and community-based suppliers than the other categories (76% at JHU, compared to 53% nationally; Real Food Challenge, n.d.-b). At the same time, while nearly half of “Real Food” purchases were ecologically sound on a national level, they made up only 17% of “Real Food” purchases at Johns Hopkins.

The university’s emphasis on local and community-based food procurement is not entirely unexpected. Many of the most prominent food procurement initiatives focus on local procurement, including farm-to-school and farm-to-institution programs, and do not explicitly incorporate other values-based standards related to workers,

ecological impacts, or animal welfare. Additionally, there is a strong emphasis on supporting local and regional food systems at the federal government level (Low et al., 2015). There may also be increased consumer interest in purchasing local foods over those that represent other values. Students at the University of Vermont, for example, valued local foods more than the other “Real Food” categories and were willing to pay a premium for “Real Food” because they associated it with support for their local food economy (Porter, 2015).

Among the JHU stakeholders interviewed, participants reported that interim goals would have been useful in making progress annually, while more specific targets in each of the categories would have ensured greater success in the other three categories. For instance, if the university wants to demonstrate its environmental commitments, it should develop specific goals on that metric. Those developing future procurement policies may look to how the Good Food Purchasing Standards developed by the Center for Good Food Purchasing, another values-driven procurement policy focused on public agencies, expect program adherents to source a baseline amount of food that aligns with each of the five program values (Farnsworth et al., 2018).

While JHU’s purchases of foods from local and community-based businesses grew substantially, two concerns emerged in this category. One of the Real Food Challenge standards specifies that products from local businesses must include ingredients that otherwise qualify under one of the “Real Food” categories in order to qualify as “Real.” Given the geographical specialization of the American food system, most grains and flours are grown and processed in the Midwest (Halloran, 2015), limiting the potential for local bakeries to procure sufficient affordable local grains to have their breads and other products counted as local and community-based. This criterion around ingredients in processed goods prevented the baked goods that JHU purchased from four local bakeries from qualifying in the local and community-based category. If they had been counted, the university’s Real Food Percentage would have increased from 30% to 36% in the 2018/2019 school year from this change alone. Furthermore, local and commu-

nity-based standards did not specify or prioritize businesses owned by women or people of color and did not distinguish between vendors that catered to low-income communities or to wealthier ones. The university could take inspiration from other procurement policies that are beginning to incorporate such priorities, such as Cook County (IL)'s Good Food Purchasing Policy, which incentivizes purchasing foods produced or processed in low- to moderate-income communities and from businesses that hire from low-to-moderate income communities, and encourages public land access for minority-owned or -controlled social enterprises and land trusts (Resolution 18-1650, 2018). National standards for the local and community-based category were also a point of tension for stakeholders at the University of Vermont (Porter, 2015) and the University of Florida (Baldwin, 2017), particularly the criterion that individual farmers that gross over US\$5 million do not qualify as local. Some felt that this discouraged local food procurement in industries where local sourcing was feasible, such as dairy, or from producers that could meet the capacity needs of large institutions. These nuances associated with the local and community-based category are also critical to consider when comparing Real Food Percentages to procurement statistics from other institutions that classify purchases as "local" based on distance alone.

Various challenges encountered in implementing the Real Food Commitment at JHU, particularly those that reflect larger dynamics within the food system, reflected experiences similar to those reported by other institutions engaging in local and sustainable procurement initiatives. These include costs, the seasonality of produce, and the capacity of small producers or distributors to meet the demand for a high volume of produce, especially if preparing or processing produce is required (Bobronnikov et al., 2021; Vilme et al., 2015). Participants echoed challenges discussed in Apoliona-Brown et al. (2020) and Santo and Fitch (2018) about working with food-service management companies, including rebates being an inhibitor to procurement shifts and the limits to flexibility in procurement choices when working with these companies. Despite these challenges, interview participants mentioned that having BAMCO as the

university's food-service provider allowed for more flexibility in procuring foods aligned with the commitment than Aramark.

Frequent turnover of students and dining staff also posed a significant challenge to implementing the commitment at JHU due to the reported importance of long-term relationships in procurement partnerships. This signifies a need for policies and documentation to facilitate the transfer of institutional knowledge and relationships. Furthermore, increasing the role of dining workers in the development and implementation of procurement policies was identified as an emergent issue. While dining workers often operate behind the scenes and without a significant voice, they play a distinct role in a university food system and could offer valuable perspectives to future food procurement policies.

Beyond directly benefiting the producers and vendors that sold local, ecologically sound, fair, and humane foods, implementing the Real Food Commitment provided a means to keep the university accountable to its sustainable dining values. Although criticisms of specific Real Food Challenge standards may be warranted, consistently evaluating and reporting food purchases across time to the university community using the Real Food Calculator likely advanced more progress toward sustainable procurement than would have been achieved without this tool. Additionally, the development of the tool's criteria by national food systems stakeholders, and the completion of the assessment by students rather than dining staff, ensured the validity of claims made by the university administration and product vendors. The implementation process also provided educational and professional benefits to the students involved in advocating for the commitment, analyzing data, and researching potential procurement shifts. These results demonstrate the importance of valuing institutional procurement commitments for more than numeric changes in product purchases over time. The benefits of such shifts will also differ based on the institution and industry; hospitals and public schools, for example, would experience different stakeholder engagement opportunities and implementation strategies. While the impact on local food producers may be similar across different sectors, nutrition standards and food prefer-

ences might still affect the nature of these relationships.

These findings suggest that future food procurement policies at JHU, as well as at other institutions of higher education, should take into consideration their influential role in the food system. While vendors with which JHU had partnered reported great appreciation, barriers to partnerships with local, sustainable, and ethical vendors could be directly alleviated by JHU, such as the need for pre-cut and washed produce and the demand for a large volume from a single vendor. Training dining workers to prepare unprocessed produce and partnering with multiple smaller vendors or a distributor or food hub that procures from small vendors could increase the university's ability to purchase from local, sustainable, and ethical vendors. The university could also reconsider committing to future contracts that require purchasing minimum amounts from specific vendors so that smaller vendors have an equal ability to compete with larger ones. Looking toward future procurement efforts, the considerable achievements of the JHU Real Food Commitment should be built upon by addressing the barriers in its previous experience to advance even greater progress.

Future research could evaluate the experiences of other schools that implemented the Real Food Commitment to support the continual evolution of local, sustainable, and ethical food procurement standards, particularly as the official national "Get Real" campaign concluded in 2020. Also, more in-depth analyses of JHU procurement data could examine how specific procurement shifts, such as the shifts of certain animal foods, impacted environmental or socioeconomic outcomes over time.

Conclusion

In signing the Real Food Commitment, Johns Hopkins University set an ambitious goal without clear expectations around the extent to which it was achievable. Although the university fell short of reaching this numeric target, it shifted US\$4.7 million between 2013 and 2019 to local and community-based, humane, ecologically sound, and fair foods without significantly increasing dining costs. This notable accomplishment demonstrates the

power of institutional procurement policies to advance changes at a scale far beyond individual dietary shifts. Many challenges, however, limited the ability of the university to reach its goal. Some of these challenges were structural, such as the limited capacity of small vendors, cost limitations, university food procurement requirements, and rebates associated with food-service management companies, while others were specific to the context of implementing the Real Food Commitment at JHU, including student preferences, limitations of implementation by student interns, and dining staff turnover. Much of the university's success in implementing its commitment was found in low-hanging fruit, such as switching to local and community-based animal source foods, while other efforts seeking to shift to higher-hanging fruit, such as challenging the university's soda contract, were unsuccessful. The metrics behind sustainability claims are not always transparent or consistent from institution to institution, demonstrating the value of rigorous and independently developed standards to ensure the validity of sustainability claims made by institutions and product vendors. At the same time, the limits to individual university procurement shifts have been recognized by the national leaders of the Real Food Challenge, as its parent organization, Real Food Generation, has begun new campaigns directly targeting the procurement and power of the three major food service management companies. The many lessons learned from this experience could inform future food procurement efforts at JHU as well as at other institutions.



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Appendix

Interview Questions

Questions asked to former interns:

- What year(s) were you involved with the Real Food Challenge and/or Real Food Calculator?
- What primarily did you work on as a calculator intern?
- What successes did you have during your time as an intern?
- What challenges did you face? Why were they challenges?
 - Were these things repeatedly challenges or just one-time occurrences?
- Which product shifts, if any, happened while you were a calculator?
- What did you gain from the experience of being an intern?
- What lessons about the food system do you think can be drawn from the Real Food Challenge?

Questions asked to dining staff:

- How long have you worked with JHU dining?
- Could you describe what role you have played in carrying out the Real Food Challenge commitment on the Hopkins campus?
- What would you say have been the biggest successes that JHU has achieved through the Real Food Challenge commitment?
- What have been the biggest challenges you have faced and why?
- What do you think JHU should consider including in its future commitments to local, ecologically sound, fair, and humane dining purchases?
- What have you gained from the experience of being involved with the Real Food Challenge?

Questions asked to vendors selling to JHU:

- What product(s) do you sell to Johns Hopkins University (at least, before COVID happened)?
- How long have you sold your [product name] to Johns Hopkins University?
- Has selling to JHU has impacted your businesses at all? If so, how?
- What challenges have you encountered in selling your product to JHU?
- What do you think the role of large institutions like JHU should be in supporting the local food system?

Studying hard while hungry and broke: Striving for academic well-being while navigating food insecurity

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Abstract

Food insecurity on college campuses disproportionately impacts underrepresented students and can contribute to detrimental outcomes. Furthermore, new research with a broader scope includes universitywide populations such as faculty and staff who may also face food insecurity. The reasons behind higher-education food insecurity are complex and based in historic academic structures that create gender and race disparities. Focusing on increasing the numbers of women and minorities entering the graduate school pipeline has resulted

in a more equitable distribution of master and doctoral level degrees. However, lower wages, higher workloads, and perceptions of inferior academic performance continue in the current day. These factors contribute to only 26% of women achieving full professorship and only one-third receiving external federal research funding. This reflection provides autoethnographical accounts of three female faculty members who experienced hunger during their undergraduate and graduate careers, and intermittently struggle with purchasing nutritious foods as working professionals. They also discuss their interactions with and observations of

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their students who also face challenges in securing meals on a regular basis. Three undergraduate female students who are actively involved in campus food projects share their insights from a personal and peer perspective. Grassroot initiatives including an onsite food pantry, a village garden, external funding, and ongoing research attempt to fill gaps. In addition to short-term fixes, it is important to continue conversations with university administration and community leaders to create policies and programs to address campus food insecurity.

Keywords

Food Insecurity, Underrepresented Students, Underrepresented Faculty, Higher Education, Grassroot Projects

Introduction

Food insecurity on college campuses and the unfortunate academic consequences for students who face hunger are well documented. Food insecurity and food deserts at our university are frequently discussed as topics of concern among our students. These discussions have expanded to include faculty and staff, who are reluctant to share their own financial burdens, including food insecurity, in the higher-education setting. In this article, a group of university faculty, staff, and students address universitywide hunger with various grassroot initiatives: a campus food pantry, a community resource guide on free or discounted food sources, a community garden, and guidelines for students to apply for Supplemental Nutrition Assistance Program (SNAP) benefits. Although these initiative help bridge the gap, challenges continue to exist in securing nutritious foods to meet current needs. Faculty, staff, and students focus on external grants to expand food-related resources and to conduct campus food-insecurity research. Three female faculty members and three female undergraduate students share their personal experiences with food insecurity while working on possible solutions with minimal funding.

Food-insecurity research on college campuses highlights the disproportionate burden that some students face; however, studies that include university staff and faculty are less common (Riddle et al.,

2020). A group of female faculty started an informal conversation about the challenges of working in academia when the issue of food insecurity arose. We soon realized that we not only experience food insecurity as current faculty members but also did previously as underrepresented graduate and undergraduate students. Now we work at a campus nestled in a thriving community that is health-driven and oriented to science, technology, engineering, and math (STEM) that has a high cost of living. Students as well as faculty and staff struggle with unexpected hidden food insecurities despite a prosperous environment. This reflective essay describes the journey of three female faculty members and the experiences of three female undergraduate students to explore the impacts of food insecurity on a college campus. In addition, we discuss university initiatives that are addressing food insecurity across campus populations and the need for future research investigating the broader scope of hunger in academia.

Intergenerational Voices: All Interconnected

Kristin Osiecki (Kristin) reflects from a first-generation college student and as an assistant professor of public health who researches health inequities in disadvantaged and underrepresented populations with an invisible disability. Angie Mejia (Angie) reflects on her position as a Latina assistant professor trained in the social sciences. Like her colleagues, she shares her frustration over the lack of support and resources for her students in an institutional context where student-centeredness is mainly performative. Jessie Barnett (Jessie) reflects on her experience as a senior lecturer in public health—a field advocating for social and economic justice—while navigating the realities of life in education. Within these experiences of shared vulnerability in the economic and professional senses, we write as social justice-minded faculty and engage in a criticism of food insecurity on college campuses. Kaitlyn Pickens (Kaitlyn) reflects on her experiences as a first-generation, premedical student who works to increase food access on campus and is passionate about social justice. Kara Nyhus (Kara) is a premedical, health-science student on campus, and she reflects on her own experience searching for safe and healthy foods as a student while also

managing a severe fear of food-borne illness. Tessie Burley (Tessie) reflects on her experience as a vegan health-sciences student who faces bulimia/binge eating disorder and is especially passionate about the health and wellbeing of others, despite struggling with her own.

Food Insecurity: It's Complicated

Studies of underrepresented undergraduate students' success often examine factors such as insufficient academic preparation, difficulties navigating the overall college experience, and ongoing financial issues (Broton & Goldrick-Rab, 2018). Data support that meeting basic student needs is central to academic development and overall success; however, housing issues and food insecurity disproportionately impact underrepresented students at higher rates than their counterparts (Broton & Goldrick-Rab, 2018). The year shown at the start of each entry represent the time in which the event took place based on notes and recollections.

1985: I sat in my 100-level chemistry class with three hundred students packed into the old, giant lecture hall. The professor begins, "Take a look at the person on your left and then the one on your right. One of these people will not be there by the end of the semester." I soon learned that this is a weed-out class designed to eliminate the weaker, nondeserving freshmen students. I have a hard time keeping up because of my lack of study skills acquired at my underperforming high school. I study relentlessly for hours and barely pass, even on the curve. Stress fuels high levels of anxiety that turn into panic attacks at the beginning of each exam, a ritual that continues throughout my undergraduate career. So I attend alcohol-fueled campus parties that are not just fun but a cheap way to cope with my extreme anxiety. (Kristin)

Student food programs are often a low priority on college campuses, even though they are essential to student performance and successful degree completion (Henry, 2017). Studies show that undergraduates experiencing housing and food insecurity have a higher risk of dropping out or having

low academic achievement overall (Payne-Sturges et al., 2018). In addition, food-insecure students tend to forgo the required textbooks to afford food, and they struggle to complete schoolwork and attend class (Kovacs, 2016).

1986: I moved into an off-campus apartment. The envelopes on the kitchen table are staring back at me, "MUST MAIL TODAY!" Rent is non-negotiable, so I seal the envelope and rush it to the on-site drop box. I postdate the electricity, cable, and phone checks and shove the envelopes into my backpack. This situation is the beginning of getting behind, and always stressed until the end of the semester, hoping I can rebuild my bank account with my summer job. That leaves me short for the start of the fall semester, but I will worry about that later. The thing is, I never catch up. I am always hungry and extremely underweight, contributing to my recurring sore throats, influenza, urinary tract infections, and exhaustion. (Kristin)

2022: I really love this part and align with it because I and so many other students do this (never catch up financially) at the University of Minnesota at Rochester (UMR) as well. (Tessie)

2022: This is so fitting to the reality of the (current) student experience and is a really valuable perspective to have included. (Kara)

2005: The financial aid office tells me that I no longer have access to work-study funds or was it that I am no longer eligible for it since my husband "makes too much money." This situation means I have to take three buses to get to the church's food pantry. I am so tired of having to hustle here. The problem with that food pantry program is that you are supposed to be ministered to and listen to the word of God before you get a box of canned food and rice. Maybe if I pretend that I do not understand, they can give me a waiver for listening to God. "No speakie English" works with bill collectors, which I have many of. Maybe it can work here? (Angie)

Studies show that food-insecure populations on campus include those with international status, Pell grant recipients, and financial aid students (El Zein et al., 2018). At the same time, utilization of a campus food pantry by these populations tends to be low because of social stigma, insufficient information, or inconvenient hours of operation (El Zein et al., 2018; Gaines et al., 2014; Henry, 2017). In the U.S., government public health policy examines social determinants of health (SDOH) such as social, physical, economic, and environmental factors that directly and indirectly affect food insecurity. Furthermore, long-term governmental practices, including institutional racism, segregation, and discrimination, perpetuate health inequities between populations and create higher rates of negative health outcomes in underrepresented and disadvantaged groups. Underrepresented students often hail from and live in disadvantaged communities that are designated as food deserts with little or no access to affordable, nutritious foods (Dhillon et al., 2019). Transitioning into higher education exasperates these conditions expecting students to adjust to a myriad of stressors, including managing limited finances and making food choices (Dhillon et al., 2019).

1989: I walk over a mile to class from my worn-out apartment on the outskirts of town. I rush into the campus building, glad for the sudden wave of warmth. The classroom's hissing radiator covers the sound of my gurgling stomach, three more hours until lunch. I then walk a mile to my campus job and dig two quarters out of my pocket for the vending machine, which is stocked with my usual lunch: Diet Mountain Dew and a Butterfinger candy bar. I savor each bite as I prepare for my job as a lab inspector. For the next four hours, I crisscross the campus, completing my inspections. This experience inspires me to change my major from biochemistry to community health education. I am unsure if this is a stroke of luck or divine intervention. I go from being on academic probation to the dean's list because I am passionate about my courses, which are taught by caring professors. When I get home, I eat a box of macaroni and cheese

and try to manage my 18-credit hour course load to graduate on time. Four more days of this routine until the weekend, then I continue the never-ending pattern of completing school-work while battling hunger. (Kristin)

Studies show that underrepresented undergraduate students face increased SDOH and educational obstacles that relate directly to college retention rates and student success (Schraedley et al., 2021). These external neighborhood stressors involving education attainment, and social justice, are complex issues that individual students have little control over. For example, low-performing public schools can limit underrepresented students' ability to navigate higher education due to a lack of college preparatory resources. Students also face social and neighborhood stressors that contribute to high dropout rates (Schraedley et al., 2021). Such conditions are perpetuated with higher-education policies that inadvertently create disparate situations for underrepresented students on campus. Addressing basic student needs such as housing and food security is nonprioritized by the administration because these financial issues are placed on the individual student, which compounds the detrimental effects to student success (Schraedley et al., 2021). The rising costs to attend college, which outpaces the buying power of family income, creates more financial hardships for families. Low-income families, with an average income of US\$21,000 per year, who secure financial aid are still required to pay on average US\$12,300 a year for their child to attend a 4-year public university (Broton & Goldrick-Rab, 2018).

2010: I have been accepted to a Ph.D. program at a private, elite university in upstate New York. I was initially excited about my four-year stipend as a teaching assistant covering all our living expenses. However, I forgot that my stipend does not get disbursed until a month after the first semester of attendance. I have to figure out what part of our budget as a family we must stretch to afford a move across the country. I hate it when we do this to our food part of the budget since we are no longer eligible for food stamps. (Angie)

2013: As my Ph.D. program comes to an end, I accept a full-time postdoctoral research position at an elite university in Houston, Texas. Although academically qualified, I quickly discovered a polite but tense competitive work environment. Although no degrees are created equal, I navigate uneasy feelings of fitting in with my Ivy League peers. I am socially ostracized, spending time exploring my new surroundings alone. My moldy apartment with outdated appliances has fecal matter in the tub due to giant flying cockroaches. Soon, income-driven student loan payments start. Emergency spending for an unexpected car accident and health issue breaks my fragile budget. I embrace my ramen-noodle and mac-and-cheese diet. (Kristin)

In addition to financial pressures, underrepresented students in higher education endure nuanced challenges as they move upward in the educational process. For example, graduate and doctoral students often must learn academic norms based on the historical context of white, male, and class-privileged colleagues (Winkle-Wagner & McCoy, 2016). Universities create policies to address “big problems” surrounding diversity and equity within these traditional boundaries, which creates an antagonistic environment for women who challenge the power structure (Jackson, 2019). Working toward a doctorate degree with little or no social networks creates even more tension when family and friends cannot identify with the pressures of the academic world (Winkle-Wagner & McCoy, 2016). This tension intensifies as underrepresented doctoral students successfully complete their degrees and face an inherent stigma of being “less than” as they compete for tenure-track positions. Although this seems like a “university culture issue,” female graduate students, especially those who accept a tenure-track position, often struggle with food and nutrition insecurity based on complex elitist academic systems. Accepting a tenure-track position creates a new and challenging work environment with a disparate culture for new hires. Adaptation is highly stressful while addressing the competitive research agendas of tenured peers, being assigned to courses no one else wants

to teach (in leftover time slots based on seniority), and burdensome service loads with expected higher time commitments (Winkle-Wagner & McCoy, 2016). Tenure-track female faculty are pressured under such practices to assure their worth by the number of hours they spend teaching, researching, and providing service to the university while continuously producing intellectual products and competing against their peers (Davies & Bansel, 2005).

Unfortunately, female faculty experience greater stressors that indirectly contribute to food and housing insecurity. Regardless of federal and state affirmative-action policies, female faculty continue to be underrepresented and underpaid compared to male faculty (Monroe et al., 2014). Over the past 50 years, academia has relied on the pipeline model, an approach of increasing the number of females in graduate school, to support women earning tenured professorial positions (Monroe et al., 2014). This model has proven to be ineffective, with 24% of full professors, 38% of associate professors, and 46% of assistant professors’ positions held by women (Monroe et al. 2014). These numbers show an alarming trend of the higher percentage of women starting in tenure-track positions, with approximately half achieving tenured full professor status. Furthermore, discriminatory practices have still been prevalent over the past decade, including demonizing motherhood, sexual harassment, demeaning remarks, and unwelcoming work environments (Monroe et al., 2014).

Things Will Be Different: Present-Day Academia

The transition into academia can be surprisingly difficult, with expensive rent, lack of diversity, and acclimating into the university structure. Research shows that gender inequities persist in higher academia in which women are continued to be viewed as less competent than their male peers (Cardel et al., 2020). Female academic researchers receive less than a third of federal grants, are perceived as producing lower-quality publications, and have significantly lower salaries than men (Cardel et al., 2020). Furthermore, while poverty is a driving factor of food insecurity, women also experience higher hunger levels due to economic conditions, ethnicity, and family structure (Ma et al., 2021).

2017: I am searching for an apartment as new faculty in an extremely tight rental market with inflated monthly costs that crushes my housing budget. I forgo a campus parking pass and cable television. My life-long academic dream dripping with student loan debt now includes a bus pass, individual servings of macaroni and cheese with diet Pepsi, and seeking out free entertainment for minimal work-life balance. I wonder if I should have applied for jobs in the government or private sectors that pay double my salary. Every week, I question this decision while looking at job postings but hesitate because of my underrepresented students. (Kristin)

2019: I have accepted a position as a tenure-track assistant professor at a university in the Midwest. Forty percent of the UMR student population identifies as Black, Indigenous, People of Color (BIPOC); 65% of the student body identifies as underrepresented (first-generation college students, Pell grant recipients). My enthusiasm and anxiety about being a faculty here co-exist in some weird relationship: I am enthusiastic about serving BIPOC undergraduates while anxious about moving to a place full of White people. I will eventually learn that a growing population of BIPOC students does not mean that they will be supported or welcomed. (Angie)

Studies show that underrepresented minority faculty face challenges regarding discrimination and inherent bias while struggling with heavy teaching and service loads while being devalued by peers as an assumed diversity hire (Ransdell et al., 2021). University initiatives to recruit underrepresented faculty focus on the hiring process. Once obtained, the new faculty member faces scrutiny, lack of support, and constant battles to prove themselves.

(Still) 2019: What the fuck did I get myself into? I found an apartment, but when time comes around to look at our cost of living, it appears we will pay more for taxes. The brown girl's dream of moving up the U.S. socio-economic hierarchy and eating organic food

morning, day, and night while watching cooking shows is all a bunch of *mentiras*—lies. (Angie)

2019: As a newer faculty member, I am fortunate to team teach with Jessie, another underrepresented public-health faculty member who is equally passionate. Also, [both being] from a major city, we discuss the challenges of integrating into a conservative socio-political environment where low/middle class and predominantly minority communities are considered “rough” or “bad.” We become quick friends and share experiences. (Kristin)

Studies show higher levels of academic-based stress among faculty with the systematic practice of increased workloads, deadlines, and responsibilities associated with understaffing (Davies & Bansel, 2005). Administrators often rely on a personal-responsibility model for self-care during times of crisis, in which the stress created by the demands of the institution is placed upon the individual (Davies & Bansel, 2005). Food-related issues are now wrapped under the umbrella of self-care as a problem associated with the pandemic (accessing food while sick and quarantining, for example).

2020: I am chronically living what I call the Sunk Cost Theory Life. I've invested so much in being here that it must get better, right? It must. I've sunk in so much. It just must. If we keep sharing student voices and advocating for ourselves, it must, right? So, I advocate and work hard and wait. I connect with students who face a housing and food insecurity daily and wonder if they can see that I'm house-poor too. I feel like I live in a place not built for me, and I am a faculty member. This city is made for others, nonlocals, medical tourists, and an impression of health and wealth that isn't the reality of working people or students. The prices of food and essentials in our place produce thoughts like, “Someday, I won't have to splurge to get this.” “If I struggle to eat on campus and in town, how do our students do it?” and “It's all connected.” (Jessie)

Having started our academic careers as underrepresented undergraduate students, we as faculty can relate to informal discussions of stomach churning, feeling lightheaded in class, and fatigue due to a lack of nutrition. We also know how scary it is to decide between buying food or paying rent, relying on a minimum wage job for a food budget, and constantly feeling behind your peers.

Food Insecurity on Campus: Leading the Change

Undergraduate students experience high levels of food insecurity, rely on cheaper food, and need more information on menu planning within a budget (Hiller et al., 2021). They also struggle due to their level in school, cooking frequency and skills, gender, and lack of a meal plan (Soldavini et al., 2019).

2017: There are no food offerings [at UMR] for students often found at other universities, such as food courts, cafeterias, or quick marts. Vending machines, refrigerators, and microwaves are available in common spaces. The only grocery stores within walking distance of campus are an organic/natural food co-op with higher-than-average costs, a full-service gas station with prepared foods, and a few international markets that carry little or no fresh produce. Overall, expensive food courts and restaurants cater to Mayo Clinic employees and medical tourists except for a few fast-food offerings. (Kristin)

2018: “And here is what a typical student kitchen looks like. Since we do not have a student meal plan, students have control over what they eat, which allows for dietary restrictions to be met. (UMR ambassador tour guide)” Perfect. If I choose to go to school here, I will be able to make sure that my food is prepared safely. As I scrutinized over the decision of which college to attend, UMR’s lack of a meal plan was a determining factor for me. I would not have to go to a dining hall and painfully obsess over whether the milk used in my macaroni and cheese dish was

beginning to spoil or whether the spinach in my salad was properly washed. I would be willing to eat meat because I would be able to double check the internal temperature myself. I need to be able to cook my own food. “Not having a meal plan seems concerning to some prospective students, but our students here love the experience of getting to cook their own meals. (UMR ambassador tour guide)” (Kara)

2018: “Are you sure you’ll be ok at a college without a meal plan?” My mom had concerns about my interest in UMR, and rightfully so. “Yes, I really want to work at Mayo Clinic and go to a small school!” I reassured her, but I had an ulterior motive for choosing this campus to be my home for the next three and a half years. My high school junior self had been struggling with bulimia and binge eating disorder for six years. I had a name for my eating disorder, Ed. Not very creative but thinking of my struggles as a different being helped me. Ed was, and still is, a devastating expert when it came to restricting me from food for long hours and binging to the point of extreme discomfort. Ed and I knew that UMR was the right school for me, for numerous reasons, one of which was the lack of a student meal plan and cafeteria. Don’t get me wrong, I absolutely fell in love with Mayo Clinic, the wonderful faculty, and the small student body, but these alone were not our deciding factors. At other universities, we saw meal plans, cafeterias, and abundant food pantries around every corner. What was supposed to be an exciting experience introduced so much anxiety. If we felt so compelled to eat just on the tour, imagine how miserable our student life would be. When we looked at UMR, we saw comfort. Comfort in knowing that this university would never pressure us to eat because instead of accessible food around every corner, there were study spots and expensive restaurants. As a student there, we’d continue with ease to participate in our extremely self-destructive food behaviors. No cafeterias, no meal plans, no affordable grocery stores within walking distance, and no

time to cook meals. It was our perfect storm. A storm that protected me, because, in a time when virtually everything in my life was changing, UMR would let me keep one thing, Ed. (Tessie)

2019: A rule in our syllabus allows students to eat during class. Early-morning courses are filled with certified nursing assistants (or other low-paying hospital jobs) coming off the night shift or afternoon courses have students preparing for the night shift ahead. We observe the meals around the room and can see obvious disparities. Those who arrive early run to the fridge and microwave a portion-controlled leftover meal in a variety of vessels: reused butter container, a cleaned-out spaghetti jar, or a fancy lunch box. A handful of students burst through the door and apologized for being late with lunch from the food court and a large latte from the coffee shop. (Kristin and Jessie)

2019: I moved into my on-campus apartment, excited about starting a new chapter in my life, only to find that feeding myself while balancing my course load would become a nightmare. I was stranded downtown, not having a car of my own and having no idea how public transportation worked. As the semester amped up, I was studying in every free minute I had, so there was no time to worry about when I could trek to the grocery store. My only hope was that my parents would be kind enough to visit me and bring me to the grocery store. (Kaitlyn)

Food insecurity and lack of nutrition are not only about health issues associated with being hungry. Food-insecure students report higher rates of physical health issues and are at risk for depression (Payne-Sturges et al., 2018). Grade-point averages are lower when students report food insecurity versus those who are not food insecure (Maroto et al., 2015). Initiatives intended to address student food insecurity range from grassroots movements to federal policy and vary in effectiveness, accessibility, and institutional support.

2019: We did it! Ed and I made it to our perfect school. So far classes are going well, I really like my professors and have two nice roommates. When I do eat, it's always peanut butter and jelly sandwiches towards the end of the day. Those are all the meals that I have time to make, and they never disappoint. They're so convenient too because I'm vegetarian. However, after a few weeks of PB&J's, I realized that I had technically been a vegan this entire time. "Well, let's see how long I can keep this up," I thought to myself. While veganism is commonly assumed to be very difficult to maintain, Ed and I had no trouble at all. All was well until I began to struggle to keep up with my classes, isolated myself, and always felt an overwhelming level of fatigue. (Tessie)

2019-2022: You see, it's not that I don't like the opportunity to cook my own meals. I love that I get to make the decision of what I cook. And when I cook. Or ... to cook. Look at the time ... it's too late to cook now, but I have leftovers from yesterday—I'll just eat those. I have class well into the afternoon and work evenings. By the time I return to my apartment, I'm too exhausted to cook, and there are assignments due before midnight. I finished the leftovers yesterday, but I'll just have some yogurt. I have a lot to do anyway, so this works out better. Homework takes priority over meal preparation, and as the semester progresses, I can't rationalize taking a few hours out of the day to get groceries, wash the produce, and put the food away. I'm out of yogurt ... but I have Cocoa Wheats in the cupboard. And break is only two weeks away. Between that and my rice, I have enough for breakfast, lunch, and dinner. When I go home for break, my parents can take me to the grocery store, and I'll be able to restock then. Plus, I'll have a little more time once all of my exams are done and I'm on break. I've had rice for eight days in a row. ... I can't do another day of rice. If I just go to bed now, I won't have to worry about cooking anything until lunch since I'm not a big breakfast person. I blame it on laziness. I'm just

being lazy right? It was a long day. ... Maybe I can cook tomorrow. I'll just have some ice cream and go to bed. I deserve that after the long day I've had. I had to be at work by 8:00 a.m., and I worked until noon. Class started at 12:30 p.m., so I didn't have time to get lunch today. I'll make something now. I wonder what is in the kitchen pantry. ... Not all of the ingredients I need are mine. I'll just wait until my roommate gets back, and I'll ask them if I can use their noodles. It's 10:00 p.m. and my roommate hasn't come back yet. My stomach growls, but I'm not actually that hungry. "I'll order you something." I deny. I don't want to waste that much money on pasta. I have a protein meal shake. That will hold me over until morning. When the opportunity arises to actually cook a meal, students greatly appreciate the opportunity to create something that fits the comfort, safety, and dietary standards they want from their food. Yet, not having a meal plan means that students are not held accountable for spending their dining hall money to eat. Going to the grocery store is an expensive and major hassle, and the task is deemed as less important than doing well in one's classes. After accounting for student commitments and expectations, many of us are too mentally and physically exhausted to rationalize cooking. Pass the ramen, please. (Kara)

2022: Now Ed and I are juniors. I'm twenty-one, and he's been loyally at my side for eleven years. I have been thinking for a while about what I should contribute to this paper. After reading what the other authors had written, I realized I needed to "expose" my Ed. Why did I choose this school? Why have I struggled here? Why am I so passionate about this research? There are many answers to these questions, with one common thread: I am sick. In no way am I saying that this school is the sole reason I am still struggling, but the environment here is a factor in my life that enables my harmful behaviors. This university makes the dangerous assumption that prospective and current students have healthy, stable relationships with food. Many do not. Rarely does a

day pass where I don't hear someone say, "Gosh, I haven't eaten anything yet today," at 4 p.m. This should not be normal, and I hope this paper helps change that. (Tessie)

Food insecurity contributes to negative mental health outcomes, including anxiety (Bruening et al., 2016) and everyday stressors were then magnified at the beginning of the pandemic. As the pandemic wears on with less expectations of "getting back to normal," the ongoing events create a divergent dialog surrounding food insecurity on campus. If anything, hunger is taking a back seat to the COVID-19 realities of illness, long-term symptoms, caregiving, and navigating the changing rules with masks, distancing, and appropriate gatherings.

On-Campus Food Pantry and Resource Guide

The UMR food pantry offers donated nonperishable items from the Area Channel One Foodbank and near-expiring produce donated from the Co-op Grocery Store. Funds from a local donor have recently allowed for offerings of basic culturally inclusive foods like rice, curry, and spices, and fresh perishable staple items like milk, eggs, and butter.

2019: I learned from my students that they go to the SSB restaurant since buying a cup of soup (at US\$3.99) allows them to fill up on the free breadsticks from the self-serve area. They tell me that they pile up on breadsticks so they can have them for dinner. Three days later, I decided to meet with senior administrators, and they told me they "are working on it," "it" being the food-insecurity issue. I retorted back with, "show me." They say they have another meeting to attend, and they ask me to find a time on their calendars for "another chat." (Angie)

2021: Working as the food security intern for the campus food pantry, I was eager to address food access on campus. My top priority was keeping the pantry stocked, and I quickly learned that this was not a simple task. Each week, I filled my entire car with boxes from Channel One, then unpacked all the items and

stocked the shelves. Within 24 hours, almost all the new food would be gone, and this would occur every time I dropped off new items from our community partners. I ordered as many items as I could to keep the pantry full. Still, during the winter and spring, when the community garden was unable to provide produce, the items in the pantry were often high in sugar or highly processed. We provided food to the students, but was the food providing the nutrients they needed to succeed in higher education? (Kaitlyn)

2022: More than just an empty fridge: This photograph [see Figure 1] shows the fridge in the student food pantry. This picture was the last in a sequence from 12 days in a row that the fridge was empty. This fridge rarely saw typical staples like eggs, milk, and fresh produce. The fridge is always something that students check during their food pantry visit, but typically end up disappointed and wanting more. (Tessie)

Figure 1. Empty Fridge in the Student Food Pantry



The campus food pantry exists due to dedicated faculty and staff who volunteer their time outside the realm of expected service. Students are involved with the food pantry for a variety of different reasons, including as volunteer hours or to earn course credit. Any expansion plans are reliant on this volunteer group to expend additional time writing grants or finding donors. At this time, the administration has not deemed this a priority for funding or student success outcomes. To help supplement the limited food from the pantry, a campus food guide lists restaurant discounts, grocery delivery, free shuttles to big-box retailers, food offered at churches, and other food pantries throughout the city. To reduce food waste, a campuswide opt-in mailing list was created to notify subscribers when leftover food from campus events was available. The resource guide is helpful but also requires additional time and effort for students to take advantage of these resources.

The Village Community Garden and Learning Center

Angie is the principal academic investigator on a campus-community participatory learning initiative, in collaboration with the Village Community Garden and Learning Center (VCGLC), to understand the role of organized garden projects in decreasing food insecurity and facilitating resilience in diverse groups in the community. Using a mixed-method approach, Angie and her team are examining the experiences of two communities in our metropolitan area: current and new growers with VCGLC plots, and university students who supplement their vegetable and fruit intake with produce provided by the food pantry. The community garden serves as a community learning laboratory for several university initiatives that include increasing access to free fresh fruits and vegetables via a community garden site. Due to an existing grant that supports access to a garden coordinator/educator, students can grow fresh vegetables and fruits to supplement their food allowance. In addition to space and education to grow food, growers not affiliated with the campus donate surplus fruits and vegetables to the local community college and our campus student food pantries. As a community garden receiving support mostly via the labor, time,

and resources from individuals, university staff, faculty, and students, the Village cannot completely supplement a student's needs for nutritious food. Nevertheless, it has been a creative response to the unique situation of our students (Mejia et al., 2020).

Supplemental Nutrition Assistance Program

Undergraduate students are now eligible for SNAP benefits through COVID-19–related expanded federal food entitlements (Minnesota Office of Higher Education, 2021). The U.S. Government Accountability Office (U.S. GAO) has reported that financial aid is insufficient to support all college costs (U.S. Government Accountability Office, 2018). In the past, students have had limited access to SNAP because they did not meet the criteria (U.S. GAO, 2018). Furthermore, 65% of colleges surveyed for the report stated that students are not informed of their possible eligibility under the SNAP program (U.S. GAO, 2018). As such, UMR staff advocates for using SNAP's recently created assessment tool and application guide to assist students wishing to apply for benefits.

Currently, female faculty, staff, and students are addressing campuswide food-insecurity issues with inclusionary measures, removing stigmas, and conducting research to identify the needs of students. Campus food-insecurity issues are well studied, especially regarding negative student outcomes related to hunger and access to nutritious foods. Achievement gaps and success measures are directly related to basic housing and food needs that are not commonly addressed at the higher-education policy level. Underrepresented students face additional stressors with integrating into campus culture, and also may experience the lack of essential resources that support their well-being. The recruitment of underrepresented students to meet university diversity, equity, and inclusion strategic goals need to be expanded to examine campus resources that support their basic needs and evaluate the effectiveness of campus nutrition programs. Also, research investigating SDOH factors that affect food insecurity both on and off campus can highlight chronic hunger problems.

Literature on campuswide food insecurity affecting faculty and staff is limited. Future research is needed to explore this issue, especially

considering the inequitable and exclusionary practices of women and minorities in academia. Food insecurity goes beyond individual female faculty to potentially affect their family households and exacerbate other stressors women face as primary caregivers, which is even more challenging since the pandemic.


Autoethnographies provide an in-depth perspective of personal experiences, which also makes female faculty and students vulnerable to institutional scrutiny, especially when exposing potential injustices based on race and gender. Possible limitations exist for faculty members to share their experiences based on the stigma of letting colleagues know of their food-insecurity issues and university climates, making it difficult to scrutinize historical biases in academia. Moving forward, our food-insecurity research design incorporates peer-led focus groups and interviews that support anonymity. Validated survey surveys that investigate campuswide food insecurity that can be shared across campuses can provide a bigger picture of hidden hunger in our institutions.

Conclusion

The food pantry and community garden continue to seek outside funds through donations or funding proposals submitted by female faculty, to meet the ongoing needs of students, faculty, and staff. The food pantry has expanded to include a gently used clothing closet that contains attire for job interviews. The community garden continues to grow and support our diverse ethnic populations both on and off campus with enriching experiences for students and community members. It serves as a cultural support initiative for those who have immigrated and settled in our community with the ability to grow their own food.

The pandemic has created unforeseen circumstances that can cause more significant disparities in food access. For example, numerous institutions either closed their doors or released faculty or staff because of budgetary constraints. Financial struggles forced many universities to institute a pay cut for personnel during the pandemic. For some institutions, the original salaries have been restored. Others received an across-the-board minimum raise, which puts underrepresented faculty behind

the pace of a competitive salary beyond the disparate conditions between genders. In the heart of a prosperous and growing community, basic access to affordable, nutritious, and readily available foods for campus populations is not readily seen. We

encourage administration, faculty, and staff to open a conversation within and outside the institution about what hidden food insecurity looks like at the nexus of higher education, underrepresented groups, and the genuine need for health for all. 

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Social value of a Canadian urban food bank garden

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Abstract

The Garden Patch—an urban agriculture program of the Saskatoon Food Bank & Learning Centre (SFBLC)—relies on corporate and individual donations in a time of growing austerity. The SFBLC

does an excellent job of communicating programs to donors, but they had not previously completed a return-on-investment analysis. A social return on investment evaluation study for the 2018 growing season provided guidance on the most significant impact of the organization's strategic objectives and provided an additional tool to communicate

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Author Note

Portions of this work are in a report on the Saskatchewan Public Health Association's website (Pham, 2018).

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Conflicts of Interest/Competing Interests

Adrian Werner was employed with the Garden Patch at the time of data collection and analysis. He did not receive honoraria for participating with the study team.

Authors' contributions

Wanda Martin: Conceptualization; writing—original draft publication; writing—review and editing. Anh Pham: Methodology; data collection and analysis; writing—report for partners; writing—reviewing and editing. Lindsey Wagner: writing—reviewing and editing. Adrian Werner: data collection; supervision; writing—reviewing and editing.

the program's value to donors and the community. This work indicates the monetary value of social benefits gained from the investments made to the SFBLC for its urban agriculture program. Data sources included harvest data, volunteer logs, budget, and workshop attendance; key informant interviews with community members, volunteers, and staff; and community-based telephone and online surveys. It also included in-person surveys with community members accessing food hampers. With feedback from stakeholders, we measured the most valued program outcomes. The inputs and resources to run the Garden Patch were valued at CA\$96,474 in 2018.¹ The outputs were vegetables for food hampers, gardening skills, physical and psychological health, and work and educational experiences. Outcomes were valued using financial proxies. For each outcome, the deadweight, attribution, and displacement were considered and discounted to calculate the impact value of \$155,419. The final calculation is expressed as a ratio of present value divided by the value of inputs. We conservatively estimate a \$1.61 of social value created for every dollar invested in the Garden Patch. We also analyze this method in the context of the current societal neoliberal paradigm, recognizing that there is much work to be done to advance food security and social justice.

Keywords

Social Return on Investment, Food Bank, Urban Agriculture, Garden, Social Value

Introduction

Smaller Canadian cities are struggling with multiple social concerns such as income and food insecurity at levels previously seen in larger urban centers (Kading & Walmsley, 2018). Saskatoon, a prairie city in central Saskatchewan with a population of 337,000, ranks 17th in size among Canadian municipalities in 2020 (Statistics Canada, 2021). The median annual income for an individual in Saskatoon is low at \$40,670 (City of Saskatoon, 2021). Public health programs and not-for-profit organizations that support vulnerable and disenfranchised people struggle to operate under austerity in Can-

ada's current economic and social environment (Cunningham et al., 2016; Guyon et al., 2017). Federal and provincial investments in public health systems have decreased, and many public health professionals consider the global neoliberal agenda a threat to health, wellbeing, and equity (Kading & Walmsley, 2018; Schrecker, 2016). Demonstrating the monetary value of social programs is increasingly important to ensure a broad allocation of resources and satisfy funders (Banke-Thomas et al., 2015). Social return on investment (SROI) measures financial value relative to the resources invested in programs to capture some measure of the social value.

Public health programs can benefit from having evidence of impact on society and the value that programs funders provide in supporting healthy populations. For example, the Saskatoon Food Bank & Learning Centre (SFBLC) provides services to the community such as emergency food, sundry low-cost items, and work and volunteer opportunities. This food bank has been operating since 1983 with no core government funding. Instead, the program relies on corporate and individual donations (Saskatoon Food Bank & Learning Centre, 2020). The SFBLC has several programs, one being the Garden Patch, which began in 2010 (Saskatoon Food Bank & Learning Centre, 2020). The Garden Patch engages volunteers to grow shared and distributed food through the emergency food basket program.

The Garden Patch began as a volunteer-operated grassroots initiative to convert a weedy and vacant city block in the City Park neighborhood of Saskatoon, Canada, into a productive space for growing food for the SFBLC. Between 2010 and 2018, the Garden Patch produced over 110,000 lbs. (50,000 kg) of vegetables for distribution through emergency food hampers at the SFBLC (Garden Patch, 2021). The Garden Patch (2021) reported that its primary goal was to grow fresh and nutritious food using sustainable food production techniques. The program goal included community engagement and asset-building opportunities and nurturing a network of local Saskatoon residents capable of achieving food security by growing

¹ All currencies in this paper are in Canadian dollars.

food. The objectives for the Garden Patch as a program of the SFBLC are engagement, education, demonstration, food access, and food policy (personal communication, Adrian Werner, September 15, 2019). Each objective has a set of key activities, and every activity serves multiple purposes. The primary purpose of the Garden Patch is to provide fresh, healthy vegetables in the food hampers for clients, people, and families who are marginalized. The purpose of this SROI study was to quantify the benefit created by investing donor funds and organizational resources into this enterprise. The results of this study supported the SFBLC's goal of evaluating its programs against its strategic objectives. Furthermore, the analysis provided a quantitative metric of the Garden Patch's impact for corporate and individual sponsors who financially support and value the SFBLC's work. The SROI provides a deeper understanding of the social value received from the investment made and highlights the efforts of the staff and community members.

Literature Review

Gardens, be they flowers, shrubs, trees, or food, provide many assets to urban settings and are collectively identified as green infrastructure (Bellezoni et al., 2021). Green infrastructure that produces food is known as urban agriculture, which encompasses a variety of food-growing methods in an urban setting (Martin & Wagner, 2018). The Sustainable Livelihood Framework (Morse & McNamara, 2013) is one way to understand the assets when examining urban agriculture. The framework is centered on five livelihood assets: natural, human (personal), social, physical, and financial. We use this framework and a brief analysis of urban agriculture's role within the current socio-political context to explore the literature on urban food gardens.

Natural Assets

Quality food production is only part of the health benefits of urban agriculture. There are additional means to sustainable livelihoods that can increase health equity. Natural assets in urban settings are essential for good health. Green infrastructure has positive effects on quality of life and wellbeing, including improved mental health (Colley et al., 2020;

Coutts & Hahn, 2015), better social cohesion (Hartig et al., 2014), a slower decline in physical activity in aging populations (Dalton et al., 2016), and reduced mortality (Crouse et al., 2017). Allen and Balfour (2014) reported that wealthy areas of a city are ten times more likely to have quality green space, experience better health outcomes, and live longer. There is a relationship between access to green space and better health regardless of economic status. Exposure to green space moderates income-related inequity in physical and mental health (Allen & Balfour, 2014). Urban agriculture can improve cities' natural assets and sustainability by contributing to soil fertility, supporting pollinators and water quality, regulating pests and pathogens, and mitigating greenhouse gas emissions that contribute to climate change (La Rosa et al., 2014). Improving natural assets in the urban environment is essential for a healthy population.

Human Assets

Human assets refer to knowledge, skills, ability to labor, and good health that allows people to pursue a livelihood (Sustainable Rural Livelihoods Advisory Committee, 1999). Howard and Britcha (2013) have identified gaps and deficits in Canadians' food knowledge and skills. Food literacy is a concept in the literature that involves understanding the entire lifecycle of food: growing, preserving, distributing, and accessing food, and where it goes when discarded (Sumner, 2013). Additionally, Kabisch et al. (2015) outline the human health and wellbeing aspects of urban green spaces, highlighting a correlation to reduced obesity and stress levels. Leake et al. (2009) identify the physiological, nutritional, and psychological health benefits of growing food in urban settings. Urban agriculture production in a group setting can improve food literacy and provide mechanisms to enhance physical and psychosocial wellbeing (Lovell et al., 2014).

Social Assets

Social assets involve networks and connectedness that foster cooperation (Morse & McNamara, 2013). Specifically, this asset includes community engagement, inclusiveness, and neighborhood stewardship (Sustainable Rural Livelihoods Advisory Committee, 1999). Robust civic engagement is

essential for cities to achieve successful comprehensive urban agriculture and to meet the challenges for many local food networks (Lutz & Schachinger, 2013). The social interaction in community gardens can play an essential role in retaining and transmitting collective knowledge on growing food and managing the local ecosystem, enhancing the human asset dimension (Barthel et al., 2015). Community gardens support community cohesion and the development of social capital as these urban spaces provide a means for developing social networks and social skills (Rogge et al., 2018).

Physical Assets

Physical assets include the basic infrastructure in the urban setting, including water supply, transportation, and access to information (Sustainable Rural Livelihoods Advisory Committee, 1999). Urban agriculture can improve physical assets with green roofs that reduce interior spaces' heating and cooling burden (Food and Urban Agriculture Advisory Committee, 2012). It can lessen the burden on municipal sewer systems and reduce urban carbon dioxide levels by stimulating productive reuse of urban organic waste and reducing the energy footprint (Specht et al., 2014; Toronto Food Policy Council, 2012). Physical assets can be expensive, but the improved infrastructure can have long-term benefits for the community (Sustainable Rural Livelihoods Advisory Committee, 1999). A community garden can be a physical asset to a city that provides space for community empowerment and developing collective forms of working (Cumbers et al., 2018).

Financial Assets

Financial assets are the cash or equivalents available to adopt livelihood strategies (Sustainable Rural Livelihoods Advisory Committee, 1999). Financial assets tend to be the least available to those who have the most to gain from improving health equity (Marmot et al., 2008). Lwasa et al. (2014) reported on the evidence that urban agriculture can reduce poverty and enhance livelihoods and regulate environmental processes. Furthermore, urban agriculture strengthens the city economy by adding what is called an "import substitution industry" in-

volving marketing, processing, and distributing through small enterprises (Smit & Nasr, 1992). Such an industry contributes to improving health equity by providing opportunities to generate income and meet food security needs.

Urban Agriculture and Food Justice

The World Health Organization (de Leeuw et al., 2014) reports on the need for integrated policies and programs based on intersectoral collaboration that can ensure a healthy and sustainable food supply, improve social cohesion, and provide environmental and economic benefits that can improve health equity. Promoting sustainable livelihoods requires various sectors involved with the natural, human, social, physical, and financial assets (Sustainable Rural Livelihoods Advisory Committee, 1999). Exploring programs based on such assets opens a window across sectors, providing space for the comprehensive practice of health promotion.

However, these programs must also be considered critically as to how they interact with (or possibly perpetuate) broader social structures. Although urban agriculture has often garnered associations in the public sphere as an activity associated with social justice, how urban agriculture programs are executed can vary greatly and have the potential to reinforce unjust social structures (Reynolds, 2015). It was particularly noted by Tornaghi (2014) that the disciplinary fields to first address urban agriculture in the academic literature took an uncritical approach to advocacy for the practice, without considering any potentially problematic practices in the area, such as the impact of access to land and/or municipal restrictions on land use, motivations for urban agriculture (leisure versus food sovereignty or subsistence), or the use of urban agriculture as a greenwashing tool in sustainable development models without considering its broader impacts.

It is worth noting that urban agriculture was once a common practice within city limits, but that this shifted in the early to mid-1900s through the enforcement of elitist, racist regulations favoring a white middle- and upper class who could afford to buy food as opposed to growing it (Bouvier, 2014). Urban agriculture is a social endeavor influenced by our dominant social structures. Ensuring that

these urban agriculture projects have a positive impact and are socially just in their application depend on whether a critical, liberatory approach was taken during their design. When looking at possible downsides or harms of urban agriculture projects, it has been noted that some projects frame themselves in a neoliberal type of self-help framework without addressing the root causes of the food insecurity that they purportedly want to address (Weissman, 2015). As another example, some projects reinforce white dominance in these urban agriculture initiatives, even if occurring in areas where urban agriculture participants are predominantly Black or people of color (Reynolds, 2015). Additionally, when looking at the impact of social structures on access to funding and resources to start or maintain urban agriculture projects, it has been noted to vary greatly due to structural racism and the demographics of who is involved in an organization's leadership (Reynolds, 2015). As noted by Reynolds et al. (2020), naming these effects of unjust social power structures is key in a movement toward food justice.

Another factor to consider should be whether the implementation of such a project allows for further austerity measures and dismantling of social welfare programs due to the option of urban agriculture allowing people to be self-sufficient (Tornaghi, 2014) or through increased reliance on the not-for-profit or volunteer sector (McClintock, 2014). Furthermore, it can play a direct role in the gentrification of low-income urban neighborhoods (McClintock, 2014). Thus, though there are numerous potential benefits of urban agriculture projects, the practice of urban agriculture should not be regarded as a social panacea. There are known shortcomings. Urban agriculture has the potential to mask food insecurity without addressing root causes, and may further entrench the neoliberal self-sufficiency mindset, allowing for rollback of social safety nets. It also has the potential for harms, dependent on how projects are implemented. However, urban agriculture is not a simple good/bad dichotomy (McClintock, 2014). Instead, it should be considered as a complex social subject that requires critical reflection like other social endeavors to ensure that it is rooted in socially just principles. It

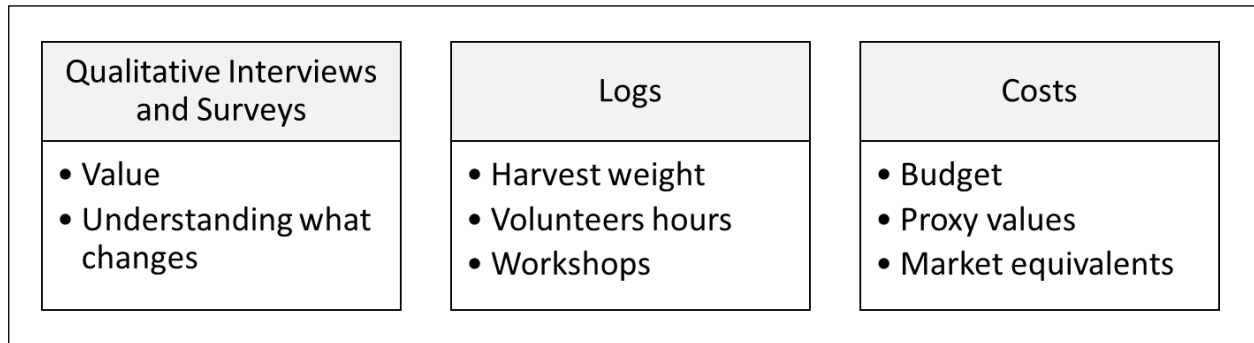
can be a useful tool when considered alongside other broader, systemic changes.

Considering food justice as the backdrop to this study is important because we are putting an economic value on a social outcome, which fits in a neoliberal paradigm. The purpose of the study was to quantify the benefits of the program, but urban agriculture has far-reaching implications and is not the answer to household food insecurity. There are, however, other social goods to an urban agricultural program, and the SROI approach allows for program users to identify beneficial aspects. This opens a pathway for critical consideration of why such a program would have value to the end user.

Methods

SROI is a principles-based method for measuring extra-financial value (i.e., environmental and social value not reflected in conventional financial accounts) relative to resources invested. Social Value UK has standardized the SROI method, providing a consistent quantitative approach to understanding and managing the impact of a project, business, organization, fund, or policy (Krevel et al., 2013). This method puts financial “proxy” values on the impacts noted by stakeholders that do not typically have market values (Social Value UK, 2020).

SROI evaluation is a structured way to understand a program using a relatable number. However, a program tells a story, and there is a story told by this value (Social Value UK, 2020). This number incorporates the program's social, environmental, and economic costs and benefits. SROI is about value rather than just a financial number. This paper aims to understand the ratio value created from benefits compared to costs calculated for the Garden Patch's growing year of 2018 (the year data were collected). The study was an evaluative type of SROI using retrospective data. It included a combination of qualitative, quantitative, and monetary summaries of information about the program and its outcomes (see Figure 1). Table 1 displays the details of the surveys and interviews. The results can assist in making program decisions about effectively providing for the community's needs. There are five main stages in the SROI process, outlined below (Social Value UK, 2020).

Figure 1. Method Structure**Identifying Key Stakeholders**

Data for this study began with a stakeholder analysis, targeting those involved in the Garden Patch operations. A summary of the six stakeholder groups included in this analysis and their involvement in the program is in Table 1. Emergency food basket program clients were members of the community attending the SFBLC to receive the vegetables grown in the Garden Patch. Some of the clients had also volunteered in the Garden Patch. Many volunteers attended the garden to do various tasks to keep the vegetables and plants growing well. It was essential to speak with long- and short-term volunteers who used the emergency food bas-

ket program to understand the value of the Garden Patch program. Upon completion, the Garden Patch offered a course with a “Gardening 101” certificate. Staff members taught gardening and employment skills and subsequently provided written reference letters to help participants obtain jobs. The staff members at the Garden Patch maintained the land, organized volunteers, guided tours, taught workshops, collected data, and evaluated the programs. Adopt-A-Plot Teams consisted of groups of friends, family members, or coworkers who volunteered together to adopt a few rows at the Garden Patch over the growing season. Finally, there are two beehives located in the Garden Patch. The

Table 1. Stakeholder Involvement

Stakeholders	Population	Sample	How involved
SFBLC clients	Approximately 20,000 people	113 surveys	<ul style="list-style-type: none"> • Medium interest in getting involved in the evaluation process • Honorarium provided
Volunteers	Over 2000 visitors and volunteers and about 50 school groups go through the Garden Patch each season	227 workshop participants	<ul style="list-style-type: none"> • Medium interest • Lower priority for some volunteers • Did not contact volunteers that came very few times
Gardening 101 participants	Two participants	One key informant interview	<ul style="list-style-type: none"> • High interest and engagement in providing feedback • High level of impact and outcomes for those enrolling in the Gardening 101 course
Adopt-A-Plot	26 teams of people	13 surveys	<ul style="list-style-type: none"> • Medium interest • Multiple recruitment emails sent to volunteers to participate
Garden Patch staff	Seven staff members	Conversations with the manager and structured interviews with all Garden Patch staff	<ul style="list-style-type: none"> • High interest and engagement in the evaluation process • High priority compared to other stakeholders
Beekeeper	One beekeeper	One key informant interview	<ul style="list-style-type: none"> • High interest in providing feedback

beekeeper and the garden program split the honey evenly. One beekeeper attended to these hives, donating a portion of honey to the emergency food basket program. The beekeeper taught a workshop as well. In turn, the bees helped increase the yield in the garden.

We did not consult some stakeholders directly for the evaluation. According to the garden manager, the garden had several supporting partners, but these partnerships did not have costs or benefits that directly affected community members. These stakeholders are listed in Table 2, along with the input and output indicators.

This study was submitted to the University of Saskatchewan Ethics Review Board (Behavioural Ethics Identification No. 196) and considered exempt as a program evaluation study. However, we did have an informed consent process, and the study was conducted following the information we presented to the review board.

Mapping Outcomes

Outcomes are products of program activity that indicate that a change has occurred (Social Value UK, 2020). The evaluator conducted key informant interviews with key community members, volunteers, and staff members with expertise and experience in the Garden Patch. Key informant interviews are in-depth, qualitative interviews with individuals who play a significant role in the community and are selected based on knowing the subject matter (Miles et al., 2014). Interviews were voice recorded, transcribed, and coded for outcome themes.

Evidencing and Valuing Outcomes

Based on the results of mapping the outcomes, we developed surveys to gather quantitative data. The surveys were made up of structured, direct questions with multiple-choice answers. They were conducted in person at the SFBLC with community members. Additionally, we reviewed existing information, prior evaluations, and data sources from the Garden Patch. A review of site documents can be a cost-effective means of obtaining available data without interrupting program implementation (Miles et al., 2014). Included in the analysis were sources such as harvest data, volun-

teer logs, the organization's budget, and workshop attendance data. We used this data to value the Garden Patch's inputs, outputs, and outcomes. The outputs and outcomes are detailed in Table 2 and Appendix A.

The SROI methodology uses financial proxies to indicate the value of a program outcome (Social Value UK, 2020). The outcomes are mapped against indicators, then assigned a financial proxy. For example, a gardening skill obtained at the Garden Patch could also be obtained at a local gardening course that participants would pay to attend. Therefore, the proxy is the cost of such a course. The indicators and values are in Appendix B and the sources for financial proxies are in Appendix C. Similarly, the vegetables from the garden could have multiple price points, so many were considered to obtain a reasonable (not inflated) value. The list of vegetables and values are in Appendix D.

Establishing Impact

The impact is essential to understanding the depth of meaning a program can have and helps prevent overclaiming its importance. For each change, we considered the deadweight, attribution, and displacement subtracted from the indicator value to calculate the impact value. Deadweight is the value once we consider how much the outcomes would happen without this program. Attribution is the value indicating the extent that the outcomes are related to the program rather than other activities. Displacement is the value representing whether the program activities are displacing other activities—would participants have taken a yoga class instead of working in the garden, for example. These are conservative estimates made by the researcher based on interviews, literature, and experience in the local context. We asked the following questions for each outcome: Would the change have happened anyway? Is any change caused because of other changes? Has this activity simply moved something rather than changed it?

Calculating the SROI

The final calculation of impact for the Garden Patch is expressed as a ratio of present value as indicated by the impact divided by the value of

Table 2. Inputs and Outputs

Stakeholders	Inputs	Value (CA\$)	Outputs
Staff includes: <ul style="list-style-type: none"> • Urban agriculture program manager • Horticulture coordinator • Engagement coordinator • 2 horticulture assistants • Fall horticulture assistant 	<ul style="list-style-type: none"> • Time, commitment, skills, expertise, experiences • Wage of \$/hr. • Producing and harvesting vegetables 	\$121,313.48	<ul style="list-style-type: none"> • 5,325 hours of staff time invested, 7 employed staff, 21720.4 lbs. of vegetables produced • Evaluations and data collection costs
	Professional development	\$3,548.13	• Job satisfaction, cell phones, T-shirts, shoes
	Workshop presentation	\$782.30	• Over 27 workshops and 234 participants
	Student education	\$184.29	• 20 student groups volunteered
	Safety-related items	\$45.27	• Safety for the volunteers and staff
	Irrigation system	\$2426.81	• Site development
	Site improvement	\$1,232.11	• Site development
	Communication and events	\$2,630.09	• Program exposure and promotion • Funder promotion
Volunteers Adopt-a-Plot School groups and corporate groups	Materials for gardening	\$9,255.51	• Lbs. of vegetables produced
	Time and commitment	\$0	• 3,870 hours of volunteering and gardening experience
	Materials specifically for Adopt-A-Plot group	\$1,211.97	• 26 Adopt-A-Plot groups involved
	Time and commitment from school groups	\$0	• 19 school groups involved, 453 students and teachers and 737.25 hours invested
City of Saskatoon	Land	\$1.00	• Renting the lot for the Garden Patch
	Water bills	\$5,719.97	• Watering plants and lbs. of vegetables produced • Handwashing stations
University of Saskatchewan	Support and partnership	\$0	• Committee meetings with Garden Patch • Healthy Yards demonstration garden • Teaching workshops • Hiring students and providing work experience
CHEP Good Food Inc.	Support and partnership	\$0	• Committee meetings with Garden Patch • Healthy Yards demonstration garden • askiy ^a interns teaching workshops • Provide Gardening 101 certificate
Saskatchewan Waste Reduction Council	Support and partnership	\$0	• Master gardeners' input, help with gardens • Provide 6 workshop sessions • Healthy Yards demonstration garden
Saskatoon Food Council	Support and partnership	\$0	• Partners with the Urban Ag Holiday Party • Host the Urban Ag tour and collaborate on committees to discuss policy changes and garden laws
Saskatoon Seed Library	Time, commitment, expertise	\$0	• Provide seeds and teach 3 workshops
Funders and corporate partners	Funding for salaries, developmental costs, gardening materials	\$0 cost to the Garden Patch	• Funders are mentioned on the staff T-shirts and at the Community BBQ
Beekeeper	Time and equipment for maintaining beehives and harvesting honey	\$695.77	• 75 lbs. of honey donated to the food bank • Greater vegetable yield • 1 workshop taught
Total		\$96,474.01	

^a askiy (all lower-case spelling) is the Cree word for earth, and is the name of a program training youth to grow food for a market garden.

inputs. It was essential not to overvalue the outcomes, and care was taken to provide a modest and transparent process description.

Results

Evidencing and evaluating outcomes were done using interviews, surveys, and existing documents. Qualitative analysis of the social value is presented below using the sustainable livelihoods framework. This is followed by the vegetable harvest records and quantitative descriptive surveys. Pseudonyms are used for all interviewees to protect their anonymity.

Qualitative Description

The Garden Patch was seen as an excellent opportunity to beautify a neglected area of the city. While the city block on which it is located has the potential for buildings, it was vacant and used as a dumpsite for those who wanted to offload garbage. The City of Saskatoon recognizes vacant lots as a challenge and thus leases the land to the SFBLC for CA\$1 per year. Having the garden on the vacant land is a service to the city. As John (a dedicated volunteer) indicated, “When the Garden Patch was first being tilled up, I thought it was a good use of underutilized land, and we shouldn’t have vacant lots that are growing weeds, so I like the concept; I like the idea of using the space to be a productive source of food.”

Being surrounded by apartments, the residents interact positively with gardeners even though they did not participate in the garden. As Frank (volunteer) noted, “I’d be out there picking away and weeding, and then someone would come out of those apartments right there, and they’d wave and say hello, and stuff like that. So, the interaction that I had with the community right there was good. It seemed like they were happy with it there and didn’t have any problems with it.” The garden provided a natural beauty service to an otherwise neglected space and freed the city of time and costs for the upkeep of the block.

The garden served as a learning ground for both new and experienced gardeners. Growing food on such a scale is unusual for people living in urban settings. An accessible experience allowed people to develop new skills and try them in their

home gardens. Karl (employee) explained, “I went in with zero knowledge basically and came out feeling confident enough that I could grow my own food, so that was really awesome.” Similarly, Sharon (employee) intended to apply the new information in a future garden:

I would’ve learned anything that was kind of larger-scale; I did learn from the Garden Patch. Things like using plastic mesh, and drip irrigation, I wouldn’t have had an opportunity to have tried that out before.... I’m expecting I’ll likely implement some ideas next year in my own garden of some things I’ve seen, and it just gives me lots of opportunities to think about, “Oh, could I try this out in a garden in the future?”

Ryan (volunteer) had some gardening experience but came away with a range of new ideas and techniques.

I also learned a bit about putting an irrigation system together. I learned a bit about transplanting potted plants. ... There were a couple of others. I learned about the three sisters growing technique; growing corn circled with bean and squash. The corn provides a climbing structure for the beans. The beans fix nitrogen into the soil, and the squash kind of provides a living mulch. And I learned a little bit about the soil. Like using a fork in the soil instead of rototilling kind of helps with the fungus network in the soil. And those are kinda some of the things I learned. I had a little bit of gardening experience before, but those are some new things I picked up.

It can be challenging to learn new gardening skills, given the fairly short growing season and space required. Having a productive working garden allowed for volunteers to invest in learning new skills that may have been inaccessible otherwise.

The Garden Patch provided a space for social interaction and a place for the human spirit to thrive. People expressed how working in the garden supported their mental health and provided a

venue for connectedness and social activity. Chris explained how he could use his skills and make meaningful connections:

Well, it certainly helped me make new friends, and like ... what I call my tribe, the urban gardeners, it certainly helped me make new friends, new connections this way. I felt useful, and my gardening skills were able to help people. I could teach new gardeners. I was given responsibilities right away and told to go, like nobody was micromanaging, so that was very ... it felt really good to be good at something and trusted with those responsibilities. It was fun pulling together at harvest time, and like we had to work hard together as a group to get it all done really quickly before the frost came, and it's I don't know; it just makes you feel proud and good, like all those new friends are good friends, and you've done something good together.

Other volunteers described how it helped deal with depression by working alongside people excited about what they were doing. The garden provided space for people to engage at their own pace and be part of something important for the SFBLC and the greater community.

The garden supplied the typical physical assets of rainwater catchment, biodiversity, and air purification that plants provide in an urban setting. There was also the physical presence of being situated in a neighborhood where help and support could be readily at hand. Karl (employee) explained, "I think that's definitely something that we do for specifically the City Park neighborhood—we're like a really nice, welcoming type space, for everybody." Vaughn described the garden as providing an additional service of neighborhood watch.

One lady was walking down the alley, and she ended up twisting her ankle really bad to the point where she couldn't move, and she had a dog, and so we basically were able to bring her into the Garden Patch and offer support and basically get someone to come and pick her up and stuff like that. So, the idea that we're kind

of around and we're always moving around probably does wonders for things like crime in the community, and on top of that, we offer a service of basically making sure that that area—that entire square block—remains to a certain standard of cleanliness or upkeepness, with the byproduct of producing food for the broader community of Saskatoon, and education on agriculture.

Maintaining an ordered and welcoming space went beyond the food production mandate.

The garden provided several financial assets, such as freeing the city from maintaining the site and providing the natural and physical assets that the municipality could otherwise supply. The garden also provided work experience and references for volunteers to gain paid employment. Vaughn described how volunteers could use their experience to advance their own financial needs:

The first thing that they're trying to do is build up a bit of a work ethic, or a work regime, so they can basically become employable, so probably about six people would show up regularly, and they would treat it as if we were their job, and they would report to us, and it was a little weird for me off the start because they would be like, "I was supposed to be here at 10. I'm sorry I'm late." And I'd be like, "You're a volunteer." Right? But I kinda caught on to what they were trying to do. They were trying to basically—for whatever reasons—whether they were depressed, or having issues, basically getting experience. They were using this as a platform. So, we had people that were from outside of Canada, like people from Africa, that were coming in regularly, and then Adrian (Senior Manager) would get calls looking for references. And usually, after we would get the calls for reference, then that person would stop showing up, so we would assume at that point he or she got a job.

The advantages go beyond the volunteers. Vaughn was also taking the knowledge he gained and applying it to a small market garden business.

I am starting a farm project outside of Saskatoon with my wife, and a lot of the techniques that I researched to start a market garden I was able to take and use that information to start a lot of projects within my own house and yard area. A lot of things like understanding how, say, a drip irrigation system works, I've been able to learn that working with them directly, and be able to take that forward into food production on a larger scale in my own ... production level.

The most significant financial asset is the food value to the SFBLC. As Karl described, "We provide locally grown produce, which is really important from a food bank aspect because—or from a food insecurity aspect—because that's the most expensive stuff, and if you're relying on the food bank to subsidize your food, chances are you're probably not able to make it to the farmers market and stock up on fresh produce, so we help fill in a gap there." Locally grown produce using organic methods is not typically affordable for lower-income people. The garden could produce high-quality vegetables for people who needed them the most. If the Garden Patch did not produce the vegetables, the SFBLC would have purchased additional food to meet the local need.

Harvest, Volunteer, and Workshop Data

The Garden Patch program coordinator provided previously recorded data and tracked and provided 2018 harvest data, the volunteer log, workshop data, and the budget. The harvest data consisted of vegetables and the total weight (21,720 pounds). Using this data, we determined the cost of these vegetables by using farmers market prices and supermarket prices (both budget and higher-priced supermarkets) for a range of \$42,020 (supermarket value) to \$54,561 (farmers market value). We calculated the average of the farmers market and supermarket costs for a value of \$48,291. The quality of these locally grown vegetables would be more like farmers market vegetables, but clients would be more likely to buy vegetables from the supermarket. There has been an increase in vegetable prices since the time of our data analysis, with a 12% increase in 2020 and an expected increase of 5% to

7% in 2022 (Charlebois et al., 2020). Therefore, the value of the garden's production is greater than what we have calculated.

Similar to the harvest log, the program coordinator kept a volunteer log. There were 3,930 hours of volunteering invested into the Garden Patch. Different documented tasks included site maintenance, planting, weeding, harvesting, education, and tours. Workshop attendance and feedback were recorded after each session. There were over 30 workshop topics and 227 participants throughout the growing season, as identified in Table 3.

Some of the knowledge and skills learned at the workshops included using a grow light and fan; starting seeds; vermiculture composting methods; bin and pit composting; learning about edible plants and weeds; dealing with pests; learning about

Table 3. Workshops and Participation, 2018

Workshop Title	No. of Participants
Garden Patch Tour + Compost Demo	27
Plant Seed Library	17
Compost 101	16
Reclaiming Our Prairie	15
Container + Small Space Gardening	15
Beekeeping	13
Harvesting + Using Finished Compost	12
Bread and Berries	12
Seed Library Harvest Party	11
Edible + Medicinal Plants	11
Canning + Preserving	11
Harvesting Wildflower Seeds	8
Traditional Plant Use	8
Hot Composting	8
The Snacking Garden	6
Bioblitz	6
Story of Soil	6
Saving Tomato Seeds	5
Natural Pest Control	4
Vermicomposting	4
Compost Workshop	3
What's that Critter?	3
How to Build an Insect Hotel	2
Plants for Pollinators	2
Saving Rainwater	1
Low Water Gardening	1

beneficial insects, bee mortality and the beekeeping process; general planting; why native plants are essential and how to grow native species; and the make-up of healthy soil.

Client Surveys

Of 116 client surveys conducted at SFBLC, 66 people were familiar with the Garden Patch. One client stated, “Yes, I visit as often as I can! Fantastic, all of it! The knowledge and expertise of the staff are phenomenal, and they listen to suggestions.” Additionally, 20 of these people have been to the Garden Patch. Seventy-six percent of the clients were interested in going to the Garden Patch. This shows that some people accessing the emergency food basket program found value in visiting the Garden Patch and were interested in getting involved, especially with special events like a community BBQ, volunteers receiving food, workshops, and work experience programs.

Client surveys also revealed that 46% use all the produce in their hampers, and 45% said there is not enough produce in the hamper. Clients mentioned that produce from either the Garden Patch or grocery stores is sometimes overripe. One client mentioned, “I love the variety of fresh items. If I get something I’ve never tried before, I enjoy looking up new recipes to try out!” Another client stated, “My family is too big and needs more produce.” Fresh, high-quality vegetables are appreciated and necessary for people using the emergency food basket program.

Evidencing and Valuing Outcomes

Using the data above and the budget reports, we calculated the key activities (inputs) under analysis and identified the outputs associated with the key activities. The values represent wages for staff, tools, and infrastructure for gardening, workshop and presentation materials, and educational resources totalling \$96,474 (see Table 2). Some inputs did not cost the Garden Patch, such as support and partnership from various organizations, yet they resulted in outputs such as workshops.

Stakeholders indicated important outcomes. The primary outcome was the freshly grown vegetables for food hampers. They also identified the natural and physical assets, education and work

readiness, physical and psychological health improvements, confidence in gardening skills, improved community aesthetics and land use, collaboration, and community-building. We identified 12 outcomes that had value or for which we could identify financial proxies for the value (Table 4). For example, gardening education was compared to a Gardening 101 course offered locally, and volunteer hours were calculated at the minimum wage. This may seem low, but conservatism is a key principle of the SROI methodology. The total value of the outputs and outcomes of the Garden Patch for one year was \$173,332.

To complete the SROI analysis, the research team considered what would or could have happened, the contribution of others, and if the program activities are displacing other activities. These estimations acknowledge the deadweight, attribution, and displacement of the program. Considering the deadweight, without the Garden Patch there was not a great chance that the vegetables for the food hampers would have existed in the form of organic, locally grown food and voluntarily provided with the same type of community experience and workshop opportunities. However, there were other outcomes that we considered possible (see Table 4). Some volunteers had noted they had already learned skills from another course or from friends and family members. People volunteering at the Garden Patch were interested in gardening or gaining some work experience. Therefore, the attribution percentage was higher. We considered what this program could have taken away from another asset for displacement. The area used to raise vegetables was an empty lot that could have other purposes, such as housing, a park, or commercial infrastructure. The percentage in displacement is low because the Garden Patch did not replace anything in the past but used ignored and unproductive land. Therefore, we calculated the impact value to be \$155,419.

Calculation of the SROI Ratio

To calculate the impact, we divided the impact value of CA\$155,419 by the input value of CA\$96,473 for a ratio of 1.61:1. The social impact value shows that we estimate for every \$1 invested into the Garden Patch, there is a CA\$1.61 of social

Table 4. Impact Value

Financial Proxy of Value	Value (CA\$)	Deadweight	Attribution	Displacement	Impact (CA\$)
Cost of vegetables averaged between farmers market and supermarket	\$48,291	0%	0%	0%	\$48,291
Cost of transporting vegetables from a wholesaler in the city	\$414	5%	10%	10%	\$311
Reducing GHG and pollution—city block of families of 4 in 10 houses	\$6,090	0%	0%	10%	\$5,481
Education compared with the same Gardening 101 program taught at Gardenline	\$56,000	0%	10%	0%	\$50,400
Work readiness and volunteer experience paid at minimum wage	\$41,429	5%	10%	5%	\$33,143
Average cost of Pilates/Yoga in Saskatoon. Average \$16 per hour volunteer drop-in x 213 volunteers	\$3,408	5%	20%	0%	\$2,556
Average cost of compost at \$29 per yard x 88 yards in 1 city block	\$2,552	0%	10%	0%	\$2,327
Cost of renting a space for community gardening workshops and average cost of a paid workshop for 227 participants x \$30	\$6,810	0%	5%	0%	\$6,470
Food safety courses at \$65 per person x 45 participants	\$2,925	5%	0%	0%	\$2,779
Cost of annual maintenance of medium size open area park	\$3,500	0%	0%	10%	\$3,150
Collaborations and systems policy meetings. Minimal cost for a networking event @\$10/hr x 25hrs	\$250	5%	5%	0%	\$200
34 kg of honey produced for food hampers at \$9.15 per kg	\$311	0%	0%	0%	\$311
Total	\$173,332				\$155,419

value created. This SROI assumes an extremely conservative measure of impact.

$$\text{SROI ratio} = \frac{\text{present value}}{\text{value of inputs}}$$

$$\text{SROI ratio} = \frac{\text{CA\$155,419}}{\text{CA\$96,473}}$$

$$\text{SROI ratio} = 1.61$$

Discussion

SROI is a newer evaluation method that can provide both organizations and funders with data to assess if a program is worth an investment. Our number is quite conservative compared to an SROI done in the United Kingdom. The UK Master Gardener Programme reported a value of 10.7:1, listing social, economic, and environmental outcomes (Schmutz et al., 2014). The authors found similar outcomes to our study, including health and well-

being, community participation, and training (Schmutz et al., 2014). However, the difference is in applying the proxy values, where we did not include in our calculations psychiatric services, cognitive behavioral therapy, or the economic benefits of preventing premature death. The strength of our calculation is that the outcomes and financial proxy measures are modest and provide proxies for activities that people may do versus therapies that may be socially or financially out of reach for the volunteers.

Furthermore, we did not attempt to calculate the carbon sequestering that the garden provides as was done in the UK study. We did, however, include the cost of pollution if 10 households lived in that space instead of having the garden. This may be considered an oversight since, presumably, the people would live somewhere and still pollute the environment, just not in that area. Calculating

greenhouse gas reduction can be as complicated as SROI, as so much depends on how calculations are made and what is being measured. Cleveland and colleagues (2017) modeled urban gardens by measuring the replacement of lawns, using household greywater, and composting organic waste to determine a two-kilogram lower emission per kilogram of vegetable harvested versus purchased. While measurements and proxy values can be argued, there is evidence that gardens help the environment.

Human assets are a primary concern of organizations such as the SFBLC and are intertwined with natural assets. While we can determine a return-on-investment calculation, the actual value is the meaning that people make of their lives. As we see in our data, the Garden Patch provided multiple assets for human capital, including gardening skills, increased self-esteem and self-confidence, along with physical and psychological benefits. Through this program, clients of the emergency food basket program had access to fresh, nutrient-dense produce that could affect their health in the long term. Leake and colleagues (2009) identified the physiological, nutritional, and psychological health benefits of growing your food in urban settings. The effect can reach beyond SFBLC volunteers and clients. Green areas in an urban setting have positive effects on quality of life and wellbeing, including improved mental health (Colley et al., 2020; Coutts & Hahn, 2015), better social cohesion (Hartig et al., 2014), a slower decline in physical activity in aging populations (Dalton et al., 2016), and reduced mortality (Crouse et al., 2017). Having a garden instead of a vacant lot produces outcomes beyond what we have calculated here. The confidence for work readiness and improving and maintaining a garden are also values that are hard to quantify and have value beyond our calculation.

Based on the value created by educational programming and the ability to increase programming without increased physical land and assets, this may be a way to increase the benefit of the Garden Patch in future years. The educational opportunities were beneficial for interviewees, whether in gaining hands-on experience or learning new skills and techniques. Additionally, more engagement and involvement of SFBLC clients also can in-

crease the project's value.

The Garden Patch provided a means for connecting people around a central activity through formal workshops and informal learning when working alongside other gardeners. Having space and opportunity for community engagement was a significant outcome. Social interaction in community gardens can play an essential role in retaining and transmitting collective knowledge on how to grow food and manage the local ecosystem, thereby enhancing the human asset dimension and social asset dimension (Barthel et al., 2015). Sharing knowledge of local food systems is an essential aspect of the collective identity of people living on the Canadian Prairies, where rural agriculture is the primary export industry. Additional human and social assets include welcoming new Canadians and having accessible means for gaining work experience. Teixeira and Drolet (2018) described the new immigrant challenges in smaller Canadian cities and highlighted the importance of welcoming spaces to help orient newcomers to Canada. The value of that work was not fully captured in this SROI, but it is vital to consider the role of community gardens and the potential for knowledge exchange across cultures.

Collaboration was included in the calculations and was essential, considering the city's food policy and food security groups. Weissman and Potteiger (2018) described how important collaboration is in providing opportunities to strengthen local urban food systems' economic and public health outcomes and contribute to environmental sustainability. Levkoe and Sheedy (2017) highlighted the Canadian context of food movement networks and the importance of collaboration to support transformative change toward a healthy food system. The Garden Patch was part of such ongoing work with the Saskatoon Food Policy Council and other collaborators interested in strengthening the local food system.

The primary physical assets the Garden Patch provides are improved community aesthetics and land use, where there was once a vacant lot across from a central industrialized area. There are five to seven hectares of park space per 1,000 people in the area (City of Saskatoon, 2020), which is moderate park space for the city. The permeable surface

makes it a prime area for stormwater management, reducing the risk of flooding. The garden also provides cooling space, counteracting the heat-island effect. Energy can be saved by producing vegetables closer to the point of consumption, with less need for cooling and packaging (Bellezoni et al., 2021). While urban gardens provide pollinator habitat, pollen can also increase, negatively affecting people with allergies.

Furthermore, there could be heavy metal deposit sources from atmospheric deposition (Bellezoni et al., 2021); however, an environmental assessment conducted at the start of the garden project found no indication of food safety concerns or heavy metals. There are many considerations of the physical assets that an urban garden provides. Quantifying such assets is not straightforward, but the social value can surface in the story that is told.

Our data showed that participants valued the reduced cost of transporting locally produced vegetables. Other financial assets included volunteer independence and work readiness skills, including the food safety course. The garden also provided jobs for staff that they reported as satisfying work. Meaningful work contributes to improved health equity by providing opportunities to generate income and meet food-security needs. Not considered in this evaluation were property value changes due to the transformation of the city block, nor consideration of gentrification. While some cities experience what local people may consider “land grabs” by urban market gardeners (McClintock, 2018), the Garden Patch leases the land, which remains a potential building site.

Overall, this study shows a variety of measurable benefits throughout all areas included in the sustainable livelihoods framework. Using this framework is helpful in conjunction with an SROI evaluation because the framework takes a holistic approach to ensuring that a variety of factors that influence long-term sustainability are accounted for in the analysis. The framework emphasizes the need to look at all aspects of a program or intervention, assess each area for vulnerability to shocks, and build resilience where the system is most at risk (Morse & McNamara, 2013). The model has been used both for analyzing existing

scenarios and for planning and development (Morse & McNamara, 2013). Additionally, the framework’s comprehensive approach that centers on people and their local knowledge is one of its key advantages (Morse & McNamara, 2013). The benefits of the Garden Patch being seen across all five key indicators in the sustainable livelihoods framework provide further evidence of the program’s value over and above the monetary SROI calculation.

However, there is a lack of socio-political context in the data presented in this paper. Both the SROI and sustainable livelihoods framework would allow for the consideration and valuing of political advocacy or social justice, but it would need to come from the interviews as part of the valuing process and part of community-based research. It is important, though, to consider the term “value” and how urban agriculture is taken up. In the current neoliberal paradigms that reign within global geopolitical structures, valuation of social interventions in a market-based, capital framework through a method such as SROI can be a valuable tool to donors to justify contributions (Banke-Thomas et al., 2015) and to inform how organizations allocate organizational resources. As outlined in Banke-Thomas et al. (2015), one of the benefits of SROI is that it allows for the computation and analysis of various stakeholder viewpoints and “value” in a singular ratio. Framing social structures around market-type relations, which in this case would be framing social value as a monetary figure, is one of the critical tenets of neoliberalism (Labonté & Ruckert, 2019). Neoliberalism also emphasizes the need for austerity measures and is detrimental to societal health and health equity (Labonté & Ruckert, 2019). Thus, though SROI uses the market-based framing to show value within our neoliberal society, it simultaneously validates the very environment causing public health and nonprofit programs to struggling in the first place (Labonté & Ruckert, 2019) and creates a need for “value-for-money” evaluations to justify their existence (Banke-Thomas et al., 2015).

Although SROI can be a valuable tool in the dominant neoliberal political paradigm, the validation it provides to existing market frameworks and its shortcomings do not account for how the par-

ticular project addresses the root issues of social justice (whether the project is designed in such a way that it aids in dismantling unjust social factors, or plays a role in reinforcing them) should be acknowledged so that the ethical implications of using such a tool can be transparent. This transparency allows for future discussions of whether framing certain measurable aspects of social structures as market relations is the best path forward, as well as a discussion of the importance of factors that are not necessarily measured, such as how a project situates itself politically. A better understanding of the relationship between social value and neoliberalism allows for questioning the values and assumptions that come with such a system. The SROI can then be framed as a stepping-stone, giving social and not-for-profit organizations a tool to justify their existence until such a time that there is a geopolitical paradigm shift that no longer requires such a market-orientated framing.

Conclusions

A recommendation for the Garden Patch's future years is continued data collection and evaluations to measure social impact and compare values in the future. Additionally, further analysis could look for ways to measure any SFBLC activities that look to impact or address root causes of food security (poverty, unjust social structures, structural racism, etc.) and how issues of social justice are addressed

in the structure of the Garden Patch program itself. Additional recommendations are to increase educational aspects of the program, such as the Gardening 101 Course, and continue to engage and involve SFBLC clients with the Garden Patch. A strength of the Garden Patch in this SROI process is that the program has vibrant and detailed data, which enabled the research group to determine the monetary value of its social impact through this SROI process. Through the monetary lens of the SROI, the Garden Patch proves its value, and with this evaluative insight and knowledge, the program is likely to increase its impact in the future years.

Continued data collection and evaluation would provide the opportunity to show further benefits over the years and the potential to highlight longer-term impacts. This SROI evaluation shows that the Garden Patch, a community-based urban agriculture initiative, can turn financial investments into social benefits of greater value than the money invested. Thus, this community endeavor adds to sustainable community development and shows measurable benefits to both corporate and individual donors.

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Appendix A

Table A1. Stakeholders, Outputs, and Outcomes of the Garden Patch, 2018

Stakeholders	Outputs	Outcomes (what changes?)
Saskatoon Food Bank & Learning Centre (SFBLC)	<ul style="list-style-type: none"> • 3,930 of hours of volunteer time invested into the Garden Patch 	<ul style="list-style-type: none"> • Fresh locally grown produce for the emergency food basket hampers • Increased environmental benefits
Emergency food basket clients	<ul style="list-style-type: none"> • 21720.4 lbs. of local vegetables produced for the food hampers • Volunteer hours invested into the Garden Patch 	<ul style="list-style-type: none"> • Access to nutrient-dense produce in food hampers • Work experience is developed from volunteering • Decreased risk of chronic diseases and any other diet related illnesses • Learning how to produce and grow vegetables. Reduce food insecurity
Volunteers (including Adopt-A-Plot, school groups and corporate groups)	<ul style="list-style-type: none"> • 3,930 hours of volunteering invested into the Garden Patch • 21720.4 lbs. of vegetables produced • 3,870 of hours engaging in outdoor physical activity • 26 Adopt-A-Plot groups involved • 19 different school groups involved, 453 students and teachers and 737.25 hours invested • 32.25 yards of compost and 777 bags of leaves • Education and workshop presentations • Over 27 workshops presented, 64 surveys collected from workshop participants 	<ul style="list-style-type: none"> • Learning new gardening skills, composting skills, community building, improved self-esteem, confidence and well-being • Physical health and psychological health increases • Engaging in purposeful activity • Influence in eating healthier produce and foods • Volunteer independence and work readiness increase • Confidence to improve and maintain own garden or start growing their own food • Increased growth in vegetables and learning composting skills • Learning new gardening techniques, composting, building garden beds, beekeeping, harvesting, starting seeds, cooking techniques and benefits of plants
Staff	<ul style="list-style-type: none"> • 5,325 hours of staff time invested 7 employed staff, 21,720.4 lbs. of vegetables produced • More than 12 different data collection documents produced • Teaching 3 cooking workshops • Offering food safety courses 	<ul style="list-style-type: none"> • Engaging in purposeful activity with job satisfaction • Improving teaching, managing and gardening skills • Sharing food safety and cooking knowledge with others
City of Saskatoon	<ul style="list-style-type: none"> • Renting the lot for the Garden Patch • Watering plants and lbs. of vegetables produced 	<ul style="list-style-type: none"> • Improve community esthetics and use of land • Space for community engagement and social infrastructure • Providing land for welcoming teaching space
University of Saskatchewan	<ul style="list-style-type: none"> • Committee meetings with Garden Patch • Healthy Yards demonstration garden • Teaching workshops • Hiring students and providing work experience 	<ul style="list-style-type: none"> • Enhance collaborations and create synergy among Garden Patch and other food related studies
CHEP Good Food Inc.	<ul style="list-style-type: none"> • Committee meetings with Garden Patch • Healthy Yards demonstration garden askiy^a interns teaching workshops • Provide Gardening 101 certificate 	<ul style="list-style-type: none"> • Collaborations and build community knowledge through Healthy Yards and workshops

continued

Saskatchewan Waste Reduction Council	<ul style="list-style-type: none"> • Master gardeners give input and help with the gardens • Provide 6 workshop sessions • Healthy Yards demonstration garden 	<ul style="list-style-type: none"> • Collaborations and build community knowledge through Healthy Yards and workshops
Saskatoon Food Council	<ul style="list-style-type: none"> • Partners with the Urban Ag Holiday Party • Host the Urban Ag tour and collaborate on committees to discuss policy changes & garden laws 	<ul style="list-style-type: none"> • Collaborations to create policies and by-laws • Building community knowledge through the holiday party and Urban Ag tour
Saskatoon Seed Library	<ul style="list-style-type: none"> • Provide seeds and teach 3 workshops 	<ul style="list-style-type: none"> • Collaborations and build community knowledge
Funders/ Corporate Partners	<ul style="list-style-type: none"> • Funders are mentioned on the staff t-shirts and at the Community BBQ 	<ul style="list-style-type: none"> • Volunteer opportunities • Collaborations and build community knowledge
Beekeeper	<ul style="list-style-type: none"> • 75 lbs. of honey donated to the food bank • Greater vegetable yield • 1 workshop taught 	<ul style="list-style-type: none"> • Honey distributed to the community members • Collaborations and build community knowledge

^a askiy (all lower-case) is the Cree word for earth, and is the name of a program training youth to grow food for a market garden.

Appendix B

Table B1. Indicators and Values

Outcome Description	Indicator	Financial Proxy	Value (CA\$)
<ul style="list-style-type: none"> Fresh locally grown produce for the emergency food basket Access to nutrient- dense produce in food baskets 	Total cost of vegetables	Cost if vegetables are purchased for the emergency food basket using the average of supermarket and farmers' market prices.	\$49,643.21
<ul style="list-style-type: none"> Reducing gas emissions and increased environmental benefits. Time saved when transporting vegetables from the Garden Patch since sorting has already been done. 	Cost of shipping on same amount of vegetables (lbs.)	Renting a U-Haul truck Size 20' or 26' to move fresh vegetables from a wholesaler in the city (average 10 km from any superstore in the city): rented for 8 hours @ \$39.95 + \$0.96/kilometers @10km x 2 = \$59.15 (7 days)	\$414.05
Cost of pollution if families were living in the space instead of having the Garden Patch.	\$609 per family using carbon tax return for families – Government cost on pollution	A block of families of 4 living on that block with 10 houses.	\$6,090.00
<ul style="list-style-type: none"> Education: Learning new gardening skills. Community-building. Improved self-esteem, confidence and well-being. 	Gardening 101 education for participants.	Compared with the same Gardening 101 program taught at Gardenline through the University of Saskatchewan: \$8,000 a course x 7 participants	\$56,000.00
<ul style="list-style-type: none"> Volunteer independence and work readiness increase. Confidence to improve and maintain their own garden or start growing their own food. 	<ul style="list-style-type: none"> 3,870 hours of volunteering invested into the Garden Patch 19 school groups involved, 453 students and teachers, and 737.25 hours invested 	3,780 hours x minimum wage work (\$10.96)	\$41,428.80
Physical and psychological health increases.	Cost of low impact exercise class.	Average cost of pilates or yoga in Saskatoon. Average \$16 per hour volunteer drop-in. 1 session for each volunteer. Calculated around 213 unique individual groups or volunteers \$16 x 213 volunteers.	\$3,408.00
Compost for the Garden Patch to fertilize the soil with essential nutrients.	Cost of purchasing compost for the Garden Patch.	\$25 per yard minimum cost. \$33 per yard maximum cost. Using the average cost of compost: \$29 per yard 88 yards in 1 city block	\$2,552.00
Learning new gardening techniques, composting, building garden beds, beekeeping, harvesting and starting seeds, cooking techniques and benefits of plants.	Education and workshop presentations. Over 30 workshops presented, 227 participants, 64 surveys collected from workshop participants.	Cost of renting a space for community gardening workshops and average cost of a paid workshop. 227 participants x \$30	\$6,810.00

continued

Sharing food safety knowledge with others.	Cost of food safety course through other organizations. 3 classes of 15 people.	Food safety \$65 per person x 45 participants	\$2,925.00
Improve community aesthetics and use of land. Space for community engagement.	Cost of managing and maintaining a park in Saskatoon.	Cost of annual maintenance of medium-size open area park, does not include any building structures.	\$3,500.00
Enhance collaborations and create synergy among Garden Patch and other food related studies. Community input on system decision and policy making.	25 hours of time spent collaborating and in meetings.	Minimal cost for a networking event/conference @\$10/hr	\$250.00
Honey distributed to the community members.	Total cost of honey produced.	75 lbs. of honey @ \$9.15/kg	\$311.93
Total			\$173,332.99

Appendix C

Table C1. Financial Proxies and Sources

Reducing greenhouse gas (GHG) emissions: https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/sas-katchewan.html
How many houses are in a block? https://en.wikipedia.org/wiki/City_block
Renting a U-Haul: https://www.uhaul.com/Reservations/RatesTrucks/
Composting costs: https://www.canr.msu.edu/uploads/236/79117/Compost_for_Midsize_FarmsQuickCourse8pgs.pdf https://www.improvenet.com/r/costs-and-prices/composting
How many yards are in a city block? https://www.convertunits.com/from/yards/to/city+blocks
Cost of maintaining a medium size park: https://content.ces.ncsu.edu/cost-analysis-for-improving-park-facilities-to-promote-park-based-physical-activity
Master Gardening Course and Garden Fundamentals at Gardenline. (University of Saskatchewan) Gardening 101 Course https://gardening.usask.ca/certificates-degrees/master-gardener1.php
Cost of honey: http://www.omafra.gov.on.ca/english/stats/hort/honey.htm
Food safety course: http://www.rqhealth.ca/departement/environmental-health/safe-food-handlers-courses

Appendix D

Table D1. Harvest Data for the Garden Patch, 2018

Crop	Weight (lbs.)	Farmers market unit price (CA\$ per lb.)	Farmers market value (CA\$)	Supermarket unit price (CA\$ per lb.)	Supermarket value (CA\$)
Beets	2,131.4	3.03	6,458.14	1.47	3,133.16
Carrots	4,376.8	2.51	10,985.77	1.23	5,383.46
Tomato	2,721.7	4.00	10,886.80	2.77	7,539.11
Spaghetti squash	4,822.5	1.50	7,233.75	1.47	7,089.08
Corn	101	0.71	60.60	3.00	303.00
Pumpkin	411	1.00	411.00	1.50	616.50
Buttercup squash	911.4	1.25	1,139.25	1.27	1,157.48
Swiss hard	141.2	5.19	732.83	2.97	419.37
Zucchini	2,812.1	2.07	5,821.05	2.47	6,945.89
Beans	1,010.6	4.67	4,719.50	3.46	3,496.68
Acorn squash	58.2	1.25	72.75	1.47	85.55
Patty pan squash	205.6	3.00	616.80	3.00	616.80
Kale	15.8	6.91	109.18	13.17	208.09
Parsley	3.4	16.00	54.40	11.76	39.98
Lettuce	112.2	2.50	280.50	7.88	884.14
Hot peppers	16.7	6.00	100.20	19.66	328.32
Sweet peppers	50.3	4.00	201.20	3.97	199.69
Peas	8.2	3.64	29.85	5.62	46.08
Radishes	651.8	2.17	1,414.41	2.02	1,316.64
Spinach	4.6	5.70	26.22	13.17	60.58
Eggplant	21.5	3.25	69.88	2.47	53.11
Rhubarb	12.2	2.63	32.09	2.63	32.09
Cantaloupe	103	2.50	257.50	1.00	103.00
Potatoes	18.6	1.69	31.43	1.47	27.34
Raspberries	3.4	9.00	30.60	14.00	47.60
Oregano	1	16.00	16.00	22.38	22.38
Tarragon	0.1	16.00	1.60	16.00	1.60
Butternut Squash	268.8	2.27	610.18	1.47	395.14
Cabbage	208.3	1.00	208.30	0.97	202.05
Cucumber	139.5	2.00	279.00	1.00	139.50
Weeds	67.6	N/A	N/A	N/A	N/A
Watermelon	66.2	2.00	132.40	0.99	65.54

continued

Turnips	57.4	3.00	172.20	1.47	84.38
Honey	57	9.97	568.29	4.09	233.13
Kohlrabi	43	4.00	172.00	4.00	172.00
Broccoli	16	4.00	64.00	2.97	47.52
Basil	12.5	9.60	120.00	18.07	225.88
Mixed greens	11.6	4.90	56.84	4.90	56.84
Parsnips	10.6	4.75	50.35	1.99	21.10
Stevia	9.4	N/A	N/A	N/A	N/A
Black currant	5.4	28.50	153.90	9.99	53.95
Celery	4.6	0.99	4.55	1.48	6.81
Cucamelon	4.4	6.00	26.40	6.00	26.40
Lavender	2.3	10.00	23.00	10.00	23.00
Shiso	1.8	9.60	17.28	9.60	17.28
Miscellaneous herbs	1.6	9.60	15.36	9.60	15.36
Tomatillo	1.6	4.00	64.00	4.00	64.00
Mint	1.4	14.00	19.60	28.15	39.41
Strawberries	1.2	4.75	5.70	2.95	3.54
Thyme	1	56.29	56.29	28.15	28.15
Lovage	0.9	N/A	N/A	N/A	N/A
Total	21,720.4		57,208.72		42,077.70

Evaluation of a sustainable student-led initiative on a college campus addressing food waste and food insecurity

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Abstract

Food waste and food insecurity present a troubling paradox found across the globe, in local communities, and on college campuses. The Campus Kitchen at the University of Kentucky (CK) is a student-

led, sustainability-focused service organization in the Feeding America Network that can serve as a local food waste checkpoint in the southeast region of the United States and address community and campus food insecurity through community-building activities. Farm-to-Fork (F2F), a free weekly meal and education program of CK, provides a case study of leveraging existing resources like

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student volunteers, CK infrastructure, and campus partners to address college food insecurity. In this case study, we evaluate the pilot model of CK and its F2F Program. The data gathered consist of the amount of food recovered, the number of meals prepared and distributed, and demographics and behavioral perceptions of college students attending F2F. From August 2018 to December 2019, CK food recovery and meal data were collected and an F2F cross-sectional student survey ($N=284$) was administered twice. The program development, implementation, and evaluation of F2F relies on the social-ecological model (SEM) to capture and highlight the complicated issues of food waste and food insecurity, and the layered approach any initiative addressing such issues must take. Ultimately, F2F highlights how programs such as CK can expand their missions of reducing food waste and food insecurity in communities and on college campuses. CK's economically and environmentally sustainable practices can be built upon to improve the diversion of food waste and use socially inclusive approaches to provide healthy meals and resources to populations experiencing challenges with food insecurity, both on and off campus, as well as educate all those involved. In turn, such an initiative highlights the need to move beyond stopgap measures, such as food pantries, in both community and campus programs targeting food waste and food insecurity.

Keywords

Food Waste, Food Recovery, Universities, Higher Education, Food Insecurity, Social-Ecological Model

Introduction and Literature Review

Food waste and food insecurity are paradoxical global concerns that occur adequate food production to feed the world population (United Nations Environment Programme [UNEP], 2020). Approximately 931 million tons of edible food were wasted in 2019 (UNEP, 2021), while about 2 billion individuals are moderately or severely food-insecure across the world (FAO, IFAD, UNICEF, WFP, &

WHO, 2019). In the U.S., 306 lbs. (139 kg) of food from retail, food service, and households is wasted per capita per year, which is higher than in other countries of similar economic development levels, such as the United Kingdom (UNEP, 2021). Such prevalence of food waste is especially troubling when one considers that 14.3 million Americans were food insecure in 2019. Kentucky, one of the top 10 most food-insecure states in the nation, projected an increase in food insecurity from 14.8% in 2018 to 18.1% in 2020 (Feeding America, 2021). Such an increase is reflected in the findings that one in seven Kentuckians, and one in six Kentucky children, is hungry. The impact of food waste extends far beyond food insecurity alone, accounting for 18% of total methane emissions in the US (U.S. Environmental Protection Agency, 2016). Moreover, global food waste contributes 4.4 Gt of CO₂ emissions per year, with nutrient-dense cereal grains, vegetables, and meats responsible for much of the carbon footprint (Food and Agriculture Organization of the United Nations [FAO], 2015).

Food insecurity is a growing public health challenge that can leave individuals with diminished nutritional status and various forms of malnutrition, including obesity, anemia, wasting, and stunting (FAO, IFAD, UNICEF, WFP, & WHO, 2019). Although nutrient-dense fruits and vegetables could enhance the nutritional status of food-insecure individuals, retailers often discard a high proportion of fruits and vegetables due to commercial quality and cosmetic standards. Furthermore, consumers account for 15–30% of fruit and vegetable food waste via foods that are purchased or acquired but disposed of in the home (Gustavsson et al., 2011). Diverting and reclaiming foods is possible through recovery, an environmentally and economically sustainable solution to food insecurity that involves repurposing high-quality, unused food, and secondary produce from farms, restaurants, and grocery stores. Regionally, such efforts are witnessed in the growth of food recovery organizations and efforts across the southeast, including Glean Kentucky,¹ East Tennessee Gleaners Co-Op,² and Haywood Gleaners in

¹ “Glean Kentucky gathers and redistributes excess fresh fruits and vegetables to nourish Kentucky’s hungry” (Glean Kentucky, n.d.,

North Carolina.³ Importantly, food recovery efforts fall under the federal Bill Emerson Good Samaritan Food Donation Act, protecting donors from criminal and civil liability (Oo et al., 2018).

College campuses are not immune to the issues of food waste and food insecurity, and more researchers, administrators, and students are uncovering and addressing this paradox on their local campuses. Over the past decade, a growing body of literature has revealed alarming rates of college food insecurity. For example, The Hope Center #RealCollege survey found that 39% of approximately 167,000 college students were food-insecure (Baker-Smith et al., 2020); several smaller studies of individual universities and multi-institutional studies reported the prevalence rates of college food insecurity ranging between 15% and 59.5% (Abu & Oldewage-Theron, 2019; El Zein et al., 2019; Payne-Sturges et al., 2017). While published rates of college food insecurity may vary depending on the locations and demographics of higher education institutions, the evidence clearly points to its growing presence on college campuses. This estimated increase in food insecurity potentially can aggravate college students' existing food insecurity, health, and well-being challenges, as the evidence explain the intersectionality of food insecurity, poor psychosocial health, including stress, and academic performance in college students prior to the pandemic (Bruening et al., 2016; Hege et al., 2020; Payne-Sturges et al., 2017).

Additionally, certain populations of college students face a disproportionate risk of food insecurity. Notable disparities in the risk of food insecurity have been noted based on race, ethnicity, gender identity, and sexuality. Students of color, especially Latinx/Hispanic, African American, and Indigenous students, experienced higher rates of food insecurity than white students (Baker-Smith et al., 2020; Martinez et al., 2016). Despite the disparities and prevalence of college food insecurity that

prompt immediate actions, there is a multitude of challenges college students encounter in accessing federal and state safety-net programs, such as expanded Supplemental Nutrition Assistance Program (SNAP) benefits, as they fall into an administrative gap. For example, in 2016, about a quarter of the 5.5 million low-income students at risk for food insecurity could not obtain SNAP benefits due to eligibility issues (U.S. Government Accountability Office, 2018). Along with the issue of food insecurity, food waste has recently experienced more attention on college campuses. In particular, college campuses, especially those with dining halls of the all-you-can-eat variety, have developed initiatives to limit, or at the least study, food waste (Rajan et al., 2018).

One program that is representative of food-waste and food-insecurity reduction efforts is the Campus Kitchen at the University of Kentucky (CK), a nonprofit student-led organization that is a partner agency of God's Pantry Food Bank within the Feeding America network. CK, a former affiliate of the national Campus Kitchens Project, is a student-led service organization founded in the fall of 2014 and housed in UKY's Department of Dietetics and Human Nutrition. CK aims to improve community food security, healthy eating behaviors, and social cohesion by recovering food that would otherwise go to waste; preparing and serving healthful meals using recovered foods; and engaging student and local community groups in educational activities (Oo et al., 2018).

Although there are student-led interventions on food waste and food insecurity across the nation, few studies have examined data and evaluated such initiatives. Since evaluation processes play an essential role in the development, implementation, and monitoring of student-driven food recovery interventions for continuous improvement of programming and pursuing future funding opportunities for such efforts, the current case

"Our mission," para. 1).

² "East Tennessee Gleaners Co-op endeavors to recover food and products that would otherwise go to waste by creating opportunities for our members to work toward their well-being and the well-being of others while also educating our members to make the best use of their work and recovered items" (East Tennessee Gleaners Co-op, n.d., para. 2).

³ "The mission statement of Haywood Gleaners is to engage volunteers and community resources to rescue and distribute surplus food to the food insecure and to promote healthy eating in Haywood County" (Haywood County Gleaners, n.d., "Mission," para. 1).

study aimed to (1) examine CK operations, including food recovery, meal preparation and service, food processing, and distribution of recovered foods with resources; and (2) describe behavioral perceptions of students who utilized CK's F2F free meal program for college students. This case study report shows how the student-led CK organization and its F2F program address the complex layers of the social-ecological model on a college campus. In turn, this case study illustrates the layered and complicated issues of food waste and food insecurity, as well as any interventions, while providing a model for administrators, educators, and scholars from other campuses to consider modifying and adopting on their own campuses to address food waste and food insecurity simultaneously.

Social-Ecological Model

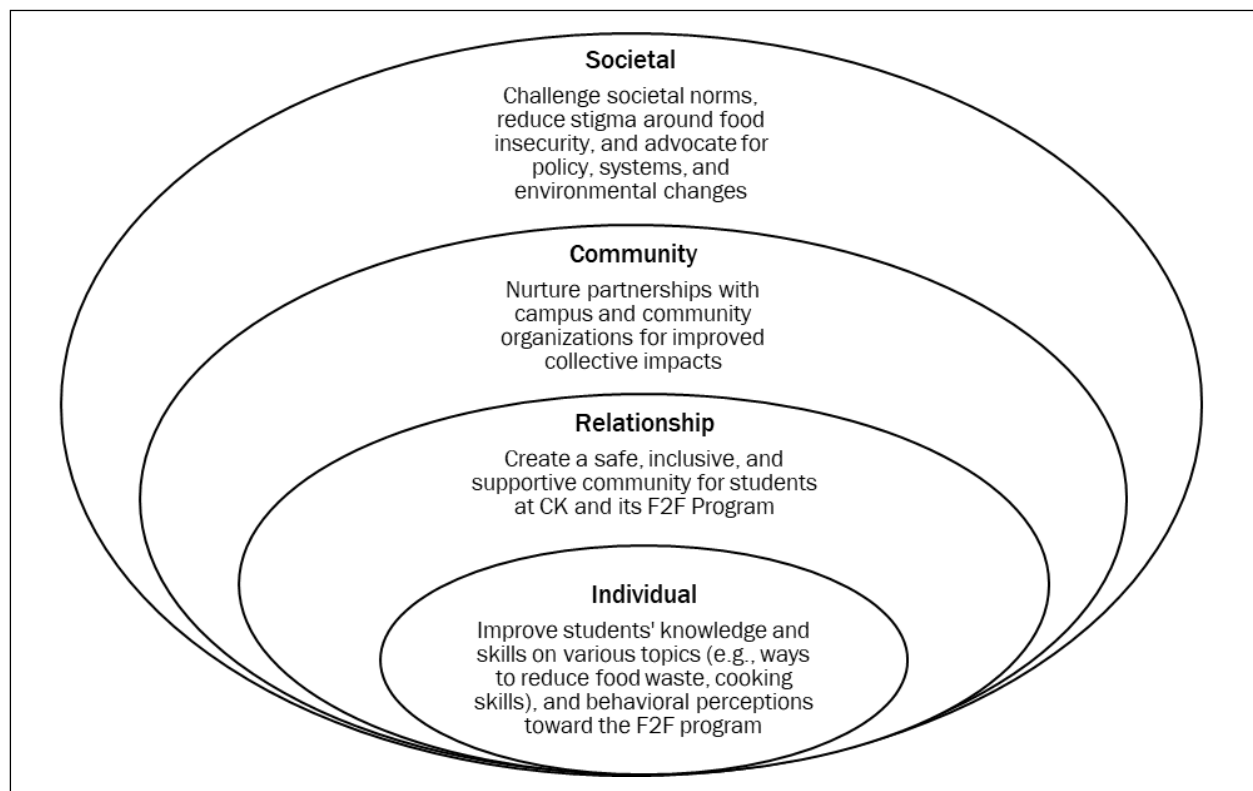
CK's use of the social-ecological model (SEM) in understanding and addressing food waste and food insecurity highlights the multidimensional status of these issues, and the complicated layers involved in

any intervention (see Figure 1). As others addressing food waste have noted, previous interventions have focused on the individual, oftentimes addressing either food waste or food insecurity. The SEM provides a multifaceted approach that reflects the individual in other contexts, forces, and actors, from communities to organizations to policies (Centers for Disease Control and Prevention [CDC], 2022). The SEM utilizes overlapping rings to highlight how factors at each level influence other levels (CDC, 2022). We appreciate how the model captures the overlapping factors involved in understanding and intervening in food insecurity and food waste, reflecting the complex interplay between various factors, including individual, relationship, community, and societal factors.

CK Operations

CK operates entirely through student volunteers with staff oversight at a large, four-year research institution in a medium-sized urban area located in central Kentucky, in the southeast region of the

Figure 1. Application of the Social-Ecological Model in Campus Kitchen at the University of Kentucky (CK) and its Farm-to-Fork (F2F) Program



United States. Typical weekly operations include student volunteer shifts for food recovery, processing to prolong the shelf life of recovered foods, meal preparation, meal-serving, and gardening (see Figure 2).

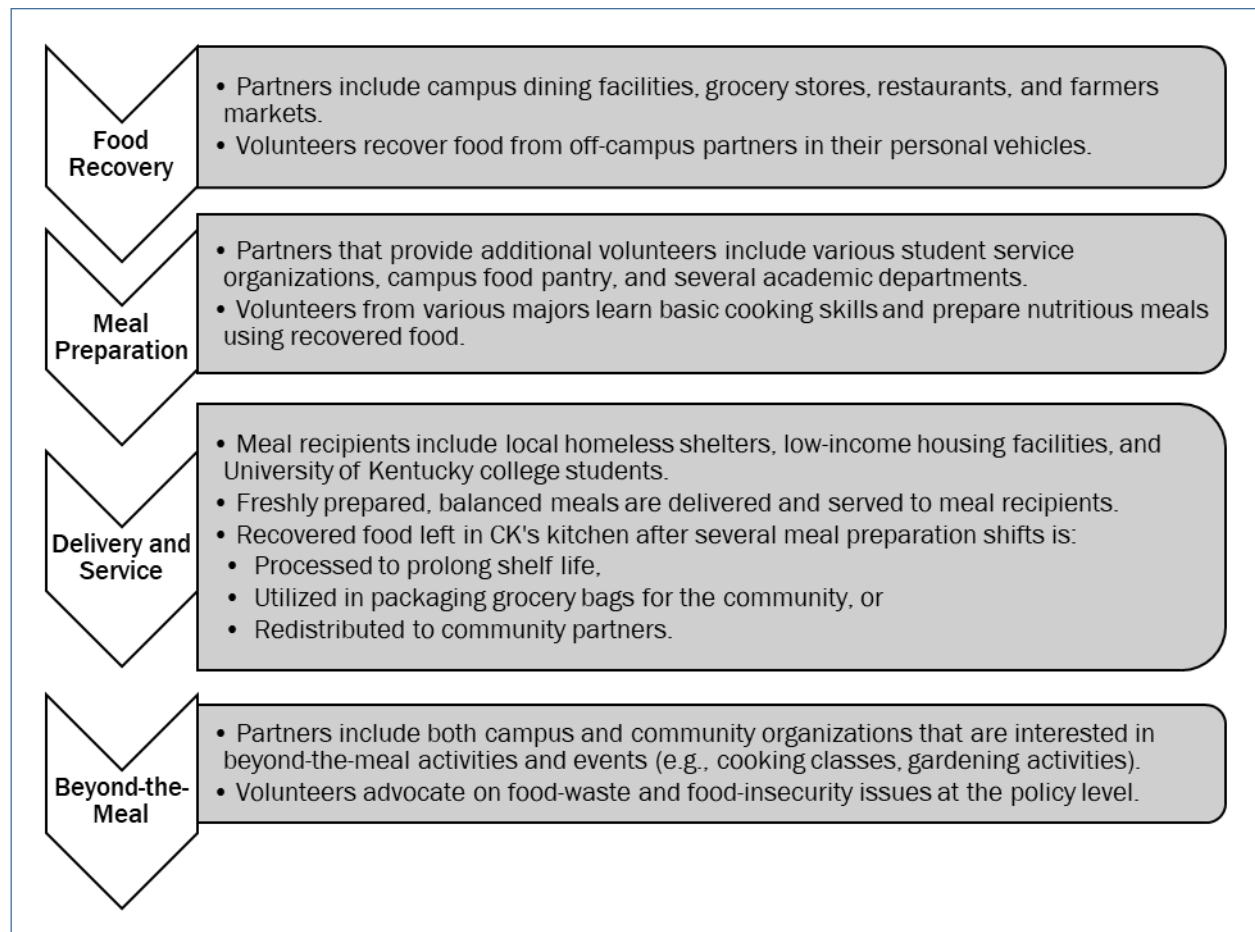
As part of the weekly operations, the environmental impact of food transportation is considered, and CK volunteers recover and deliver the majority of food in their personal vehicles. Volunteers are encouraged to carpool when possible to reduce the environmental impact and reduce any confusion about exact food recovery locations. Recovery from a campus farm once per week requires the greatest travel distance, at 11.2 miles for the round trip. However, several on-campus recovery and delivery shifts, such as those from dining facilities to student dormitories, require no vehicular transportation and instead utilize a large wagon, allow-

ing volunteers to walk rather than drive.

To limit waste, volunteers deliver congregate CK meals in reusable containers when allowed by recipient facilities and serve F2F meals using reusable tableware. Kitchen signs encourage students attending F2F to bring personal Tupperware when taking meals to go, but biodegradable containers and utensils are available. Compost bins are placed near the dish return area for F2F attendees to discard their inedible food or food scraps. All waste is composted using a commercial pulp dehydrator at two campus dining facilities as part of a campus-wide composting initiative (Mills, 2019).

As part of CK's beyond-the-meal programming that targets the individual level of SEM, CK students developed and promoted weekly educational materials and activities based on the time of the year (e.g., cooking class before Thanksgiving,

Figure 2. Campus Kitchen at the University of Kentucky (CK)'s Model, Partners, and Weekly Operations



recipe cards utilizing seasonal produce). Those materials and activities generally are designed around five overarching categories: (1) cooking skills, (2) healthy eating, (3) gardening, (4) budgeting, and (5) sustainable food systems. Among these themes, cooking skills, gardening, and sustainable food systems utilized hands-on activities for students and community members, such as cooking classes, gardening workshops, weigh-the-waste events, and trivia games. Topics were additionally broken down into subthemes to provide a greater educational range.

Educational sessions related to cooking skills included knife skills, healthy meatless recipes, Plate It Up Kentucky Proud recipes utilizing local produce, and a virtual “Tasty Tip Tuesday” series, which provided a series of topics on less common produce and ways to prepare it (e.g., acorn squash or edamame). Educational gardening sessions included garden recovery and beautification, soil nourishment, companion planting, composting, and informational resources for building one’s own kitchen herb garden. Lastly, educational sessions related to sustainable food systems incorporated signage and discussions about reducing daily food waste and use of to-go materials, knowing the origins of the food on your plate, and raising awareness about the campuswide food composting initiative and CK’s work. At every meal service and delivery, hard copies of educational materials are provided to CK’s meal program attendees, and the CK blog and social media platforms also post educational materials.

CK’s Farm-to-Fork Program

In fall 2018, F2F was launched by a group of researchers, including faculty and CK students, as a response to growing awareness of food waste and food insecurity on campus (Oo et al., 2020; Sandar et al., 2019). F2F integrates social, environmentally sustainable, local, nutritional, and educational elements to affect the pillars of sustainability in the University of Kentucky (UKY) student community. This program expanded the work of CK into a free meal program for students by operating as one program within the CK enterprise, using and building on resources and educational materials that have been created for broad CK distribution.

CK volunteers use recovered food to develop and serve an F2F weekly lunchtime meal at a central campus location, which functions as the CK kitchen and the F2F cafeteria. Since community enrichment is critical for CK, F2F wove various CK educational materials, from recipe cards to nutrition information to weekly trivia, directly and indirectly into weekly meals, allowing the larger CK structure to impact the smaller F2F initiative. Although CK is housed in the College of Agriculture, Food and Environment, F2F is available to all students. Initially, the primary goal of the pilot program was to respond to growing concerns over campus food insecurity by utilizing the operations and structure of an established program, such as CK. While F2F attempted to address a gap rather than solve the problem of food insecurity, researchers positioned it as an innovative intervention in the systemic paradox of food waste and food insecurity, while also contributing to a sense of community on campus as diners could eat with others in the cafeteria space (or take a meal to go).

Evaluation of CK Operations

From August 2018 through December 2019, researchers recorded and tallied the total number of volunteers, service hours, and meals served, CK budget data, and the amount of food recovered, distributed, and composted to depict the frequency of the operational data.

The following CK operations data allow for a better understanding of how F2F fits within the broader CK program. During the 18-month period, weekly CK operations consisted of 9–10 recovery shifts, 1–2 processing shifts, 4 cooking shifts, 4–5 meal-serving shifts, and 2 gardening shifts, all of which engaged 25–30 student shift managers, 8–10 student executive committee members, and hundreds of volunteers per semester. During the 18-month period, through the efforts of 500 unique student volunteers who dedicated 4,890 service hours, CK was able to divert 14,990 lbs. (6,800 kg) of food from landfills, 7,308 lbs. (3,315 kg) of which was produce.

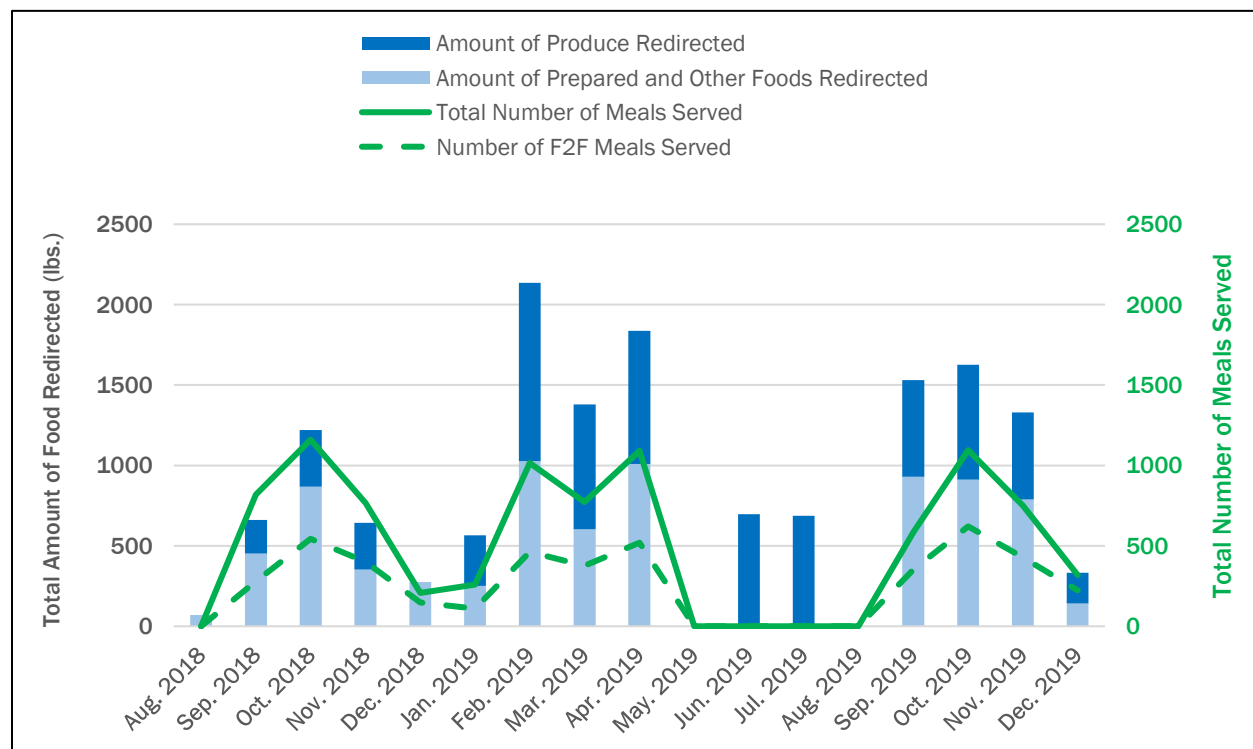
Using those recovered foods, CK provided 8,839 meals along with 5,183 lbs. (2,351 kg) of food and produce to the community. The average cost was US\$5,700 per semester for all CK opera-

tions and the survey research. Of the total meals served by CK, F2F meals for university students for 18 months accounted for 4,465 meals, utilizing approximately US\$6,000, or about one-third of the entire CK operations expenses. The rest of the meals were hand-delivered and served to meal recipients in the community, including a local homeless shelter, low-income housing facilities, and so forth. The only meals served in CK's kitchen were F2F meals. In terms of recovered food value, 14,990 lbs. of food that CK recovered was estimated to be worth about \$24,284 based on the calculation of US\$1.62/lb. provided by Feeding America (Second Harvest Food Bank of Tennessee, 2021). Additionally, an estimated value of labor contributed by CK volunteers was US\$35,453, calculated from the federal minimum wage of US\$7.25 per hour. Ultimately, by adding those two estimated values of food and labor, CK had an estimated economic impact of US\$59,737 during the 18-month period. This economic impact represents more than triple the amount of the total CK expenses, including survey research.

To provide the data trends in depth, Figure 3 shows the total number of meals prepared based on the total amount of food recovered or redirected, including produce, prepared, and other foods, such as bagels. A portion of the food recovered was utilized in preparing F2F meals and other community meals. The left axis of Figure 3 displays the total amount of redirected or recovered food, and the right axis displays the total number of meals served.

In general, the recovery volume was greatest midsemester, and it was lower at the start and end of the semester and over the summer (see Figure 3). The least amount of food recovered in one month was 71 lbs. (32 kg) in August when students returned to campus and new CK leaders and volunteers were being trained. Conversely, the greatest recovery occurred in February, with 2,135 lbs. (968 kg) recovered during the month. Consequently, the largest volumes of meals served were observed in October of both years and February and April 2019, ranging between 1,015 and 1,160 meals. However, the number of meals served stayed fairly

Figure 3. Prepared and Other Foods Recovered Stacked with Produce Recovered Trended over Total Number of Meals Served and Number of Farm-to-Fork (F2F) Meals Served over an 18-month Period



consistent despite the great increase in the amount of food recovered. Since there was no cooking shift during the summer months, no meals were served.

To prevent recovered food from being wasted, recovered foods left in the CK kitchen after all the meals for the week have been prepared, were frequently processed to prolong their shelf life, packaged into grocery bags, and redistributed to community partners, such as homeless shelters. Table 1 summarizes the number of student volunteers, service hours, and the amount of food used in packaging grocery bags and redistributed to community partners following CK's weekly meal preparation during the 18-month period. Similar to Figure 3, student volunteers and service hours were considerably lower during the summer months and at the beginning and end of each semester. Service hours per month were greatest in October and November 2018 and February and March 2019, ranging between 504 and 787 hours per month. Since Feb-

ruary 2019 was the month with the greatest amount of food recovered and the greatest number of meals served, the amount of food packaged into grocery bags and redistributed to community partners during that month was also the greatest. During the summer months, the majority of food recovered was simply packaged into grocery bags and redistributed to community partners. Composted food totaled 352 lbs. (160 kg) of foods and plate waste in the fall 2019 semester; composting amounts were minimal before that time.

CK operations, including F2F, require minimal cost, with secured funding from internal grants and in-kind donations used to support an outdoor campus garden; student leadership stipends; leadership development, team building, and educational activities; appliance and utility charges; to-go supplies, such as containers and utensils; marketing materials; survey incentives; and supplemental food for well-balanced meals. The average cost for one semester of running student-led CK operations and

Table 1. Number of Student Volunteers, Service Hours, Amount of Food Packaged into Grocery Bags and Redistributed Following Weekly Meal Preparation over 18-month Period

Months	Number of Volunteers	Service Hours	Amount of Food Packaged into Grocery Bags and Redistributed (lbs.)
Aug. 2018	0	0	0
Sep. 2018	185	382	90
Oct. 2018	336	787	0
Nov. 2018	226	530	0
Dec. 2018	36	100	0
Jan. 2019	77	160	15
Feb. 2019	376	677	1034
Mar. 2019	272	504	669
Apr. 2019	168	345	674
May. 2019	0	0	
Jun. 2019	12	12	506
Jul. 2019	17	17	891
Aug. 2019	0	0	0
Sep. 2019	141	282	448
Oct. 2019	248	458	416
Nov. 2019	224	459	363
Dec. 2019	88	177	77

conducting survey research with F2F attendees was approximately US\$5,700. The average cost of F2F per semester was US\$2,000, with approximately US\$500 going toward to-go supplies, US\$1,000 for student leader stipends, and US\$500 on supplemental food expenses.

Evaluation of the Farm-to-Fork Program

F2F Evaluation Survey Measures

The authors developed the F2F evaluation survey to assess student perceptions of the F2F program. The survey tool was pretested by UKY students who did not attend F2F. Survey measures included student demographics and variables of interest (gender, age, race/ethnicity, college major, year in school, living situation, and if they worked for pay), the frequency they attended F2F during the semester (1–3, 4–6, or 7 or more times), if they utilized other food assistance programs or resources (yes/no), and what they learned from the F2F program. Additionally, the survey included 18 Likert-scale questions (1 being strongly disagree to 5 being strongly agree) about how their meal experience with F2F influenced certain areas of their life or behavior, including, but not limited to, forming connections with others, accessing healthful foods, and improving overall perceived food security. Eligibility criteria for students to complete the survey included being 18 years or older, attending the university, and having attended F2F at least once in a given semester. Upon arrival to F2F meals, attending students provided an email address through which they received a recruitment email for the survey at the end of the spring and fall 2019 semesters. To capture a timely evaluation, students attending F2F both semesters were eligible to complete the survey once per semester. As an incentive to complete the survey, participants had an option to enter a drawing for US\$10 grocery gift cards.

The statistical software used for all analyses was JMP (Version Pro 14). The descriptive format displays demographic variables. Researchers analyzed behavioral perception variables regarding personal feelings toward F2F (Likert items) by frequency of attending F2F using the Kruskal-Wallis test to examine differences. Significance was set at

a p -value of <0.05 . University of Kentucky Institutional Review Board approved the study protocol.

F2F Evaluation Survey Results

Of the 629 students attending the F2F lunch program, 45.2% ($n=284$) participated in the program evaluation survey. Students attending weekly F2F meal sessions and completing the survey were predominately white (69.3%), female (69.3%), 18–23 years of age (73.6%), living off campus (77.0%), and undergraduate senior status in college (29.6%) (Table 2). F2F survey respondents represented 68 majors and 14 colleges. Students completing the F2F survey were largely from the College of Arts and Sciences (34.3%) with majors such as biology, psychology, Hispanic studies, and neuroscience.

There was a significant relationship between dining in at F2F and feeling that the program helped facilitate connections with others ($p=0.0225$), as compared to taking food to go. Non-white survey respondents were 61% more likely to utilize food resources than their white counterparts ($p<0.001$, OR=0.39, 95% CI= 0.2–0.7). In terms of what they learned from F2F, more than half of respondents described that they learned more about food waste, ways to reduce food waste, the importance of local food, food-insecurity issues, ways to make healthy meals, healthy recipes, and sustainability.

As shown in Figure 4, those who attended F2F more frequently (7 or more times a semester) responded more positively than others who attended F2F less frequently (1–3 times and 4–6 times) toward the following items of behavioral perceptions regarding F2F (all $p<0.05$).

Discussion

As food waste accounts for significant amounts of greenhouse gas emissions, CK's efforts to redirect food away from landfills prevented 1,244.17 lbs. (564.3 kg) of methane from food decomposition from entering the atmosphere (FAO, 2015). Ultimately, CK and the F2F meal initiative are beneficial from the individual to planet levels. Economically, CK has made an estimated economic impact of over US\$60,000 from utilizing student volunteers to divert food from being wasted, thus ensuring that natural resources used for food production

Table 2. Demographics of Farm-to-Fork (F2F) Evaluation Survey Respondents (N=284)

Variable / Subgroup	n (%)
Gender (n=270)	
Male	67 (24.81%)
Female	187 (69.26%)
Other	16 (5.93%)
Age (n=269)	
18–23	198 (73.61%)
24–29	47 (17.47%)
30 and older	24 (8.92%)
Race/Ethnicity (n=270)	
White	187 (69.26%)
Hispanic or Latino	30 (11.11%)
Black or African American	19 (7.04%)
Asian	14 (5.19%)
Other	20 (7.40%)
Year in school (n=270)	
Freshman	32 (11.85%)
Sophomore	32 (11.85%)
Junior	67 (24.81%)
Senior	80 (29.63%)
Graduate and Professional	59 (21.85%)
College (n=265)	
College of Agriculture, Food and Environment	72 (27.17%)
College of Arts and Sciences	91 (34.34%)
College of Engineering	54 (20.38%)
Other	48 (18.11%)
Living situation (n=270)	
On-campus	62 (22.96%)
Off-campus	208 (77.04%)
Work for pay (n=270)	
Yes	179 (66.29%)
No	91 (33.71%)
Dining location (n=284)	
To-go	98 (34.51%)
Dine-in	186 (65.49%)
Frequency of Farm-to-Fork visits (n=284)	
1–3 times	111 (39.09%)
4–6 times	83 (29.23%)
More than 7 times	90 (31.68%)

^a included nonbinary, those who preferred to self-describe, and those who chose not to disclose.

^b included biracial, multiracial, and those who chose not to disclose.

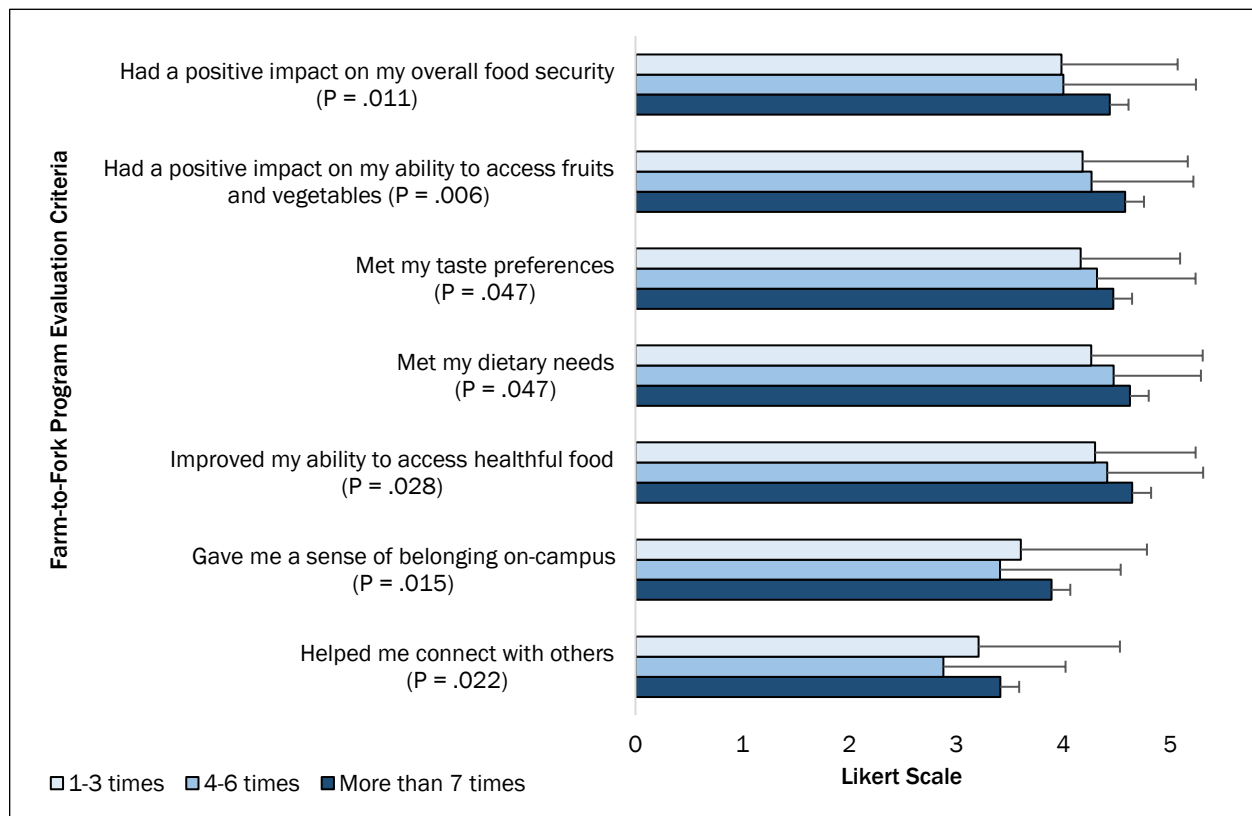
^c included colleges of Communication and Information; Design; Education; Engineering; Fine Arts; Health Sciences; Law; Medicine; Nursing; Public Health; Social Work; and Gatton College of Business and Economics.

are not wasted and contributing to social welfare services in the community.

In comparing CK operations with similar student-led food recovery chapters in the national Food Recovery Network (FRN), FRN chapters on average recover 2,503 lbs. (1,135 kg) of food per semester and engage an average of 83 volunteers per year (Food Recovery Network. 2018 Annual Report, 2017; Food Recovery Network. 2018 Annual Report, 2017). The CK operation is substantially larger than a typical FRN chapter. Excluding recurring volunteers and summer 2019 food recovery data, CK recovered 4,536 lbs. (2,057 kg) of food and engaged 112 unique volunteers per semester on average. While comparing the type of food recipients in the community, CK primarily served college students and low-income housing agencies, including senior residences, while FRN chapters predominately served shelters and soup kitchens (Food Recovery Network. 2018 Annual Report, 2017; Food Recovery Network. 2018 Annual Report, 2017). In this way, CK was able to reach food-insecure populations that may be largely overlooked by similar food delivery programs but who face disproportionate rates of food insecurity nonetheless. Additionally, FRN chapters simply recover and distribute food, whereas CK operations ranged beyond recovery to include food processing, meal preparation for congregate meals, and community-enrichment programs involving nutrition education.

In terms of produce recovery, CK gleaned 1,775 lbs. (805 kg) of produce in summer 2016, which was more than the 1,382 lbs. (627 kg) of produce gleaned in summer 2019 (Oo et al., 2018). Summer recovery in 2019 was much lower partly due to the lack of a stipend-supported summer student fellow whose primary role was to manage volunteer recruitment, training, and engagement as well as interact with community partners and recovery locations to develop and manage a weekly production schedule. Building partnerships is critical for CK's operations, and it targets the community level in SEM. Nonetheless, CK

Figure 4. Likert-scale Ratings on Farm-to-Fork (F2F) Evaluation Criteria by Frequency of F2F Visits (N=284)



recovered more than twice the proportion of produce (48.8%) compared to FRN chapters' typical produce recovery (21.7%) in 2018 (Food Recovery Network. 2018 Annual Report, 2017; Food Recovery Network. 2018 Annual Report, 2017). Comparatively, some college campuses use electronic alert systems to let students know when rescued food is available on campus (Frank, 2020). However, CK and F2F rely on regularly scheduled recovery and delivery rather than an alert system. Scheduled operations allow meal planning based on dietary guidelines, and each meal includes a source of grains, vegetables, fruit, and a choice of meat or plant-based protein. Given that food-insecure individuals do not have consistent access to fruits and vegetables (Baker-Smith et al., 2020), CK was able to provide a significant amount of free nutrient-dense meals and produce bags to campus and city community members experiencing food insecurity.

Additionally, CK provides experiential learning and student development through its leadership

structures, trainings, and hands-on experiences. For example, a team of undergraduate dietetics or nutrition students drafts weekly menus, reviewed by a registered dietitian (RD) in the department, providing students with the opportunity to apply their knowledge outside the classroom and ensure meals meet both caloric and dietary needs of the community. Likewise, student volunteers and leaders of CK are repeatedly learning about food waste and sustainability to utilize best practices in the operations of CK and in their personal routines.

Annually, an average American wastes about 225–290 lbs. of food, with fruits and vegetables accounting for 39% of this waste (Conrad et al., 2018). However, one study on food waste knowledge, attitudes, and behavioral intentions among university students found that students perceived that 65% of food waste occurred upstream of the consumer and that consumer food waste was less than actual consumer food waste, indicating how college students may have downplayed their own contribution to food waste (Alattar et al.,

2020). Several food waste awareness campaigns have been established to educate consumers about the economic and environmental impacts of unnecessary food waste and showcase creative ways to reduce food waste. CK, via F2F and community interaction, provides age-appropriate educational resources on topics including sustainable food systems and best practices to reduce individual food waste. F2F educational materials inform college students of various food system–related practices, allowing them to have a better understanding of and appreciation for where their food comes from, food waste, composting, and ways to reduce to-go material waste in dine-in settings. F2F attendees are also engaged in various hands-on, interactive activities that promote social interaction with peers and target positive behavioral changes to promote less wasteful behaviors. Activities specifically designed for F2F student meals include food-waste trivia questions, table discussion questions, and taste-testing.

Based on survey responses on what students have learned from F2F, more than half stated that they learned more about food systems, including food waste, composting, food-recovery efforts, food insecurity, and healthy meal preparation. Those topics mentioned by respondents were covered in the educational materials and activities provided at F2F, possibly indicating that attendees recognized key messages from those materials. Future studies can explore student learning and development in terms of food systems topics before and after attending such programs.

Lastly, students attending F2F meals more than seven times a semester had significantly more positive perceptions of how F2F impacted their quality of life, including areas such as a sense of belonging on campus and reduced worry over food security, compared to their counterparts who attended less frequently. Such findings support the use of a layered model in understanding how the individual may fit into relationship and community layers, despite the limitations in terms of predictability on students' perceptions of F2F based on the linear regression models. Enhanced belonging and improved food security have been shown to also improve students' retention in postsecondary education and scholarly activity, improving academic

performance (O'Keeffe, 2013). Such findings may offer some support for student services, from dining to housing, that encourage students to get involved and become a part of a campus community.

From educational materials to community dining to meals from recovered produce, the F2F program illustrates the usefulness of the social-ecological model (SEM) in understanding campus and community food waste and food insecurity. An individual utilizing the F2F weekly meal program gains a free nutritious meal, meeting his or her physiological need for food at that moment. Moreover, individuals enter a relationship with fellow diners and student volunteers. Through educational materials and talks from special guests, the individual may recognize relationships even beyond their fellow diners/students. In discussing the roles of dining halls with a marketing director for a large campus dining operation, the director shared that beyond the food, the most important part of a dining hall is the relationships formed from eating together or near others. The commensality reflected in dining halls or the F2F cafeteria proves to be important in forming positive relationships not only with others but also with food-waste and food-insecurity programs. Creating a community structured around sustainable food systems and inclusive practices through F2F is an approach to target the relationship level of SEM.

At the community level, F2F relies on a community of volunteers, staff, and faculty, as well as the campus community, including that of CK. As opposed to the more individual focus of resources such as campus food pantries or coupons for a free meal at the dining hall, F2F highlights the strength of communities in addressing food waste and food insecurity. Specifically, individuals recognize the ways in which food waste and food insecurity are community concerns, as opposed to individual choices. Finally, SEM's societal level asks us to consider and address the broad societal factors sustaining and, in turn, impacting food waste and food insecurity. We might consider policies such as mandatory dining plans, financial aid, and SNAP requirements within the SEM model, particularly at the societal level. While F2F meals represent a straightforward stopgap, limited in their ability to eliminate campus food insecurity completely, the

popularity of F2F provides evidence of a widespread need to address campus food insecurity. Furthermore, programs such as F2F ask those involved to consider the social and cultural norms determining how we understand and discuss food waste and food insecurity. For example, some might ask, “Isn’t being hungry just a part of college?” Addressing this norm proves key in educating others about the impact food insecurity can have on college students and why more needs to be done to move beyond stopgap interventions.

The current study is not without limitations. The total number of volunteers for CK is high due to volunteer data recorded as a simple count of volunteers each day instead of a data count of unique volunteers over time. Likewise, data were cross-sectional from students attending by semester, which does not show longitudinal change. In addition, experiences and perspectives from community and campus partners and student volunteers were not recorded to add more insights into the challenges and successes of CK’s model and the F2F program. Future research should include volunteer data by person and shifts and include unique longitudinal data on CK’s operations and experiences of partners, stakeholders, and student volunteers, to reflect any changes over time.

Additionally, it should be noted that not all foods recovered by CK are redirected or composted. Seeing that most recovered foods brought in by CK are no longer eligible for sale in retail settings, expired foods, damaged packaging, and bruised produce are common among recovered items. Foods most disposed of in the CK operation include molded breads and baked goods, rotten produce, and severely dented canned goods. The Good Samaritan Act states that, while nonprofit organizations may serve any donated food appearing fit for consumption, gross negligence in food service is contestable. For this reason, CK volunteers must dispose of recovered foods that do not meet food-safety standards.

While CK’s operation is not waste-free, two large dining halls on campus have a commercial pulp dehydrator to turn plate waste, unbleached paper towels and napkins, compostable to-go containers, and CK’s inevitable food waste (including prepared food and meats) into compost used by

the university’s campus farm and local farms. During the time of this case study, CK composted approximately 300 lbs. (136 kg) of undistributed, unused, and inedible foods. It is likely that recovery locations such as grocery stores and farmers markets would simply discard any unused foods to a landfill.

Despite some inevitable waste, CK provides an additional checkpoint in the food system that rescues food before it reaches the landfill to create thousands of meals and redirect hundreds of pounds of food donations per semester. CK’s model works well at the University of Kentucky partially due to a large college student population, available resources, and administrative support at the departmental, college, and university levels toward CK’s operations and its F2F program. It is important to consider the volunteer base and resource availability when exploring potential student-led initiatives on food waste and food insecurity. Understanding and being open regarding such limitations also prove useful from an SEM approach; we, and researchers at other campuses, can better witness the limits to certain layers or how certain layers fail to interact effectively around aspects of food waste or food insecurity. Nonetheless, we can also see where policies, such as the Good Samaritan Act, can help or at least intervene in local practices and policies.

Conclusion

This case study with operational and evaluation data highlights one of the few if only, campus meal programs addressing food waste and food insecurity on a college campus. Universities have a unique opportunity to offer service-learning opportunities related to addressing issues surrounding the food system, including food waste and food insecurity. Specifically, on-campus dining facilities and enthusiastic student volunteers assist with gleaning, food preparation, composting waste, and serving meals to the community. This study is supportive of sustainable efforts to reduce food waste while simultaneously addressing food insecurity, supporting the environment, and promoting positive health outcomes through the distribution of healthy meals and beyond-the-meal programming with social cohesion and education. Universities need to take a

multilayered approach to understanding and addressing food waste and food insecurity if they plan to move beyond stopgap measures. While F2F provides a model for addressing the paradox of food waste and food insecurity on college campuses, perhaps it may also spur structural and societal changes that make such programs obsolete, both on campus and in the community.

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Community relationships and sustainable university food procurement: The University of North Carolina at Chapel Hill and the Real Food Challenge

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Abstract

Many universities are working toward more sustainable campus dining food systems. Third-party standards that offer definitions of sustainable food and outline procurement goals are one tool univer-

sities can use to drive food system transformations. We seek to understand how campus community stakeholders influence campus sustainability commitments and what effects third-party certifications have on food purchasing and the campus dining community. We explore these questions by examining the circumstances surrounding, and outcomes of The University of North Carolina at Chapel Hill

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Katelyn Cline was a Real Food Challenge intern for Carolina Dining Services in Spring 2020 and a member of the research team from which this data originated.

Alexandria Huber-Disla was a member of student group Fair, Local, Organic (FLO) from 2013 to 2017, as well as a Real Food Challenge intern for Carolina Dining Services in spring 2014.

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Dr. Elizabeth Havice has served as the advisor for the Real Food Challenge internship with CDS from 2017 to the present.

(UNC)'s 2010 engagement with the Real Food Calculator/Real Food Challenge (RFC), a third-party standard for sustainable campus dining. Our analysis is based on reports from the past 10 years that document UNC's progress with RFC, along with participant observations, stakeholder interviews, and a student survey. Our findings reveal that new and developing relationships emerge as third-party goals become institutionalized: at UNC, a small, vocal group of student stakeholders pushing campus administrators for third-party certification evolved into a sustained collaboration between students and campus dining administrators centered on maintaining and advancing purchasing toward more sustainable options. Over time, the RFC commitment was formalized into the foodservice contract at UNC. These findings suggest that community relationships at universities are central in sustainable food transitions: the relationships shape, and are shaped by, efforts to move toward more sustainable campus procurement practices.

Keywords

Institutional Food Procurement, University, Certifications, Real Food, Farm to Institution, Sustainable Purchasing, Accountability, Foodservice Companies, Relationships

Introduction

Large universities feed thousands of students, faculty, staff, and visitors on campus daily and are part of a broader institutional food system that, globally, "accounts for 35% of the total foodservice market, second only to cafes and restaurants at 46%" (Martin & Andrée, 2012). To do so, universities frequently enter into time-bound contracts with large foodservice companies to coordinate food procurement and preparation, and to hire and manage dining staff, among other functions. Many universities are incorporating food into their broader university sustainability goals both because members of their campus communities demand it and in recognition that universities can play a role in driving change toward social and environmental sustainability (Grech et al., 2020). For universities feeding thousands of people per day, a move to spend 20% of a total food budget on "sustainable" food products—the metric outlined by the Real

Food Challenge (RFC), one of few options for a third party standard for university food systems—stands to drive change throughout the agrifood systems in which universities engage.

The literature on university efforts to make campus food more sustainable focuses on the following topics: barriers to local food procurement (Dunning, 2016; Janssen, 2014; Martin et al., 2012); willingness to pay for sustainable food options (Porter et al., 2017); behavioral economics strategies to shape student behavior, including placement of items and signage (Chan & Ramsing, 2018; Kurz, 2018; Schindler-Ruwisch & Gordon, 2020); and university wide sustainability plans that include some discussion of dining (Grech et al., 2020; Swearingen White, 2014; University of Michigan President's Commission on Carbon Neutrality, 2021). We expand on these topics by focusing on how sustainable, third-party food commitments shape and are shaped by food system stakeholders in a large university setting (about 20,000 undergraduate students). The communities involved in a university food system are expansive. They include students, faculty, and staff who are daily consumers of food on campus; foodservice corporations that enter into supply contracts with the university; food providers and farmers; third-party certification organizations; campus dining services; university administrators; and others. We examine the experiences of community stakeholders at the University of North Carolina at Chapel Hill (UNC), which in 2016 committed to RFC (see Box 1) and agreed to purchase 20% "real food" by 2020. We use UNC's experience to explore the following questions:

1. What roles do stakeholders and stakeholder relationships play in driving campus sustainable food commitments?
2. What effects does reliance on third-party certifications have on campus food purchasing and community relationships?

First, we review literature on the roles of institutional procurement, community pressure, and third-party certifications in efforts to drive sustainable transformations in food systems, situating our focus on their community and stakeholder rela-

tions. Then we explore our methods, which include a review of over 10 years of reporting on dining at UNC, 13 in-depth semi-structured interviews, a survey, and participant observation. We then introduce our historical analysis of the case and the community relationships that led UNC to commit to RFC and examine how stakeholders and stakeholder relationships shaped and were shaped by the RFC commitment. In the conclusion, we reflect on the implications of this analysis for a broader understanding of how community relations intersect with universities' sustainability efforts.

Institutional Purchasing with a Focus on Universities

Institutional foodservice refers to establishments that offer prepared foods for consumers to eat on-site (away from home) and includes, but is not limited to, private and public hospitals, university dining halls, correctional facilities, nursing homes, government agencies, corporate cafeterias, and school meal programs at K-12 schools (Thottathil & Goger, 2018). Large institutions such as hospitals and universities commonly purchase food from industrial food systems typified by long supply chains and production systems that have negative environmental and social impacts, including increased emissions of greenhouse gases compared to ecologically based methods used on small-scale farms (Fuchs et al., 2009; Lin et al., 2011). Some institutions handle dining internally, but the focus in this article is on institutions (universities, specifically) that contract dining services to foodservice companies, such as Compass Group, Aramark, and Sodexo.

In recent years, institutions, activists, and non-profit organizations have begun to conceptualize large institutions as potential drivers of change toward a more sustainable food system. A sustainable food system is broadly thought to be a "food system that delivers food and nutrition security for all in such a way that the economic, social, and environmental bases to generate food security and nutrition for future generations are not compromised" (Food and Agriculture Organization of the United Nations [FAO], 2018, p. 1). Given that large institutions have considerable food budgets in

buyer-driven value chains, a theory of change has emerged that suggests that when institutions implement values-based procurement, they can generate more ethical and sustainable models for food purchasing (Goger, 2019; Klein, 2015; Louie, 2019). From this perspective, institutions can use their purchasing power to drive sustainable procurement through food value chains: they can require and incentivize their suppliers to meet sustainability goals, and, in turn, suppliers seek out producers who utilize sustainable and socially responsible production practices.

Literature on these transformations has examined the role of institutions in food systems change in a variety of ways. For instance, Jones, Pfeifer, and Castillo (2019) examined the roles of stakeholders like health professionals, food and agriculture businesses, activists, and policymakers in addressing food systems challenges. They found that alternative food initiatives led by nonprofits, public and private institutions, and consumers are changing how people eat and think about food in relation to social issues like climate change and social justice. Goger (2019) examined how institutional foodservice bodies can employ third-party certifications and standards to address food systems' threats to environmental degradation, dangers to livelihoods, and malnutrition. In this context, attention is growing to the role that universities, as institutions, are beginning to play in driving sustainability transformations (see, e.g., Middleton & Littler, 2019).

Foodservice Companies

Institutions can face many barriers when attempting to prioritize local food and support local agricultural sectors and producers. For instance, supply variability and price can make it impossible for large institutions to commit to local producers (Dunning, 2016; Janssen, 2014). Despite the difficulty of acquiring local food, sustainability stakeholders often pressure foodservice companies continuously to seek local food. The sustainability goals of universities and the profit-motivated goals of large foodservice companies might be in conflict with each other and thus prohibit the flexibility required for large institutions to work with smaller or local suppliers (Martin & Andrée, 2012).

Large institutions—in our case, universities—often enter into contracts with foodservice companies to facilitate the task of consistently feeding large numbers of students, staff, and faculty (see also Goger, 2019; Jones et al., 2019). The main three international foodservice companies (Compass Group, Aramark, and Sodexo) are characterized by centralized supply chains, centralized management structures, and a dependence on prepared food. The central characteristics of contemporary foodservice companies emerged in the 1970s alongside policies that created the internationalized agri-industrial food economy typified by the expansion and consolidation in agribusiness sectors, a reduced role of the state to monitor and implement environmental regulations, and a highly competitive food system centered on high production volumes at low costs (Clapp & Fuchs, 2009; Goodman & Watts, 1997; Howard, 2016; Martin & Andrée, 2012). The alternative to foodservice company contracts is for an institution to handle food procurement and preparation in-house, a topic we do not cover in this paper but that is important in the broader discussion of institutionalized food purchasing.

In recent years, however, many institutions and consumers have expanded from a singular focus on low cost to a vision of food systems that incorporate sustainability (for broader context on this transition, see Friedmann, 2005). As institutional buyers and customers have expressed interest in shifting toward procurement that prioritizes sustainability, foodservice companies have adapted to client social pressures (Thottathil & Goger, 2018), including in university settings (see e.g. Middleton & Littler, 2019). The typically progressive spaces of colleges and universities create an opportunity to utilize campus procurement to shift foodservice companies toward sustainable purchasing. If a university (the buyer) requires more sustainable purchasing, foodservice companies will compete for the contract, and over time, contracts may begin to routinize sustainability targets. An example of this

occurred at the University of Toronto (U of T) in Canada. U of T developed a sustainability policy that states that its foodservice outlets must provide a minimum quantity of sustainably produced foods grown within 250 km (155 miles) of the university. When the university's contract was up for renewal, each of the three major foodservice companies bidding for the contract worked with a sustainable food provider to meet the criteria. This shows that the foodservice companies were willing to change their purchasing practices to secure competitive contracts with the university (Friedmann, 2007; Martin & Andrée, 2012).¹

Community Stakeholders

We define community stakeholders as any member of the institution's community who has direct or secondary influence on purchasing decisions, including consumers, institution administration, influential community leaders, and customers (e.g., students and faculty), among others. On university campuses, community stakeholders—particularly students—have had an influence on institutional procurement practices. For instance, students in the late 1990s demanded that universities eliminate contracts for athletic apparel made in sweatshops in favor of developing contractual relations with companies that offer better conditions and livelihoods for workers (see, e.g., Cravey, 2004; Silvey, 2004).

In the case of universities' food purchasing, pressure from the community is often a key factor in driving large institutions toward what are often more costly sustainability goals. Pullman and Waddock (2017) found in a number of Northwestern institutions that pressure from students and parents led to increased sustainable food purchases. Students, particularly those organized in groups or clubs, can educate their peers and generate interest in sustainable food to create momentum before approaching dining administrators (Burley et al., 2016). Researchers studying two universities in Canada found that “students are by far the largest

¹ In 2016, U of T ended its dining contract in order to retain even further control of its food purchases. This example still highlights that foodservice companies are responsive to contractual demands from large institutions while bidding. The extent to which food services companies maintain their contractual obligation to more sustainable purchasing is outside the scope of this paper, but should be considered in future work.

group within any campus community and often generate the greatest degree of change when they mobilize to make their demand and their voices heard” (Bohunicky et al., 2019, p. 62). Several studies have found that students are willing to pay more for food that is local, organic, non-GMO, or sustainably produced (Bruno & Campbell, 2016; Feenstra et al., 2011; Porter et al., 2017). Thus, the role of community stakeholders, particularly those purchasing meal plans, is essential to understanding institutional food purchasing decisions in the university setting. Our research complements these findings and broadens them to include stakeholders beyond students and parents. While consumers (usually students) and purchasers (usually foodservice companies or dining administrators) have different goals in the food system, in our analysis we consider them—as well as faculty and administrators—as stakeholders in the community because all play a role in shaping the food system.

Third-Party Certifications

In this context, third-party certifications have emerged as a key tool that “buyers,” such as universities, can use to formalize a commitment toward more sustainable purchasing, monitor progress toward that commitment, publicize their progress to stakeholders, and learn from other universities through the networks that develop from these certification systems (see e.g., Auld et al., 2009). Broadly, third-party certification tools are premised on the notion that goals defined by neutral, expert third-party bodies, and independently audited, can be a tool for institutions to transform their own purchasing, and, in the process, place collective pressure on suppliers to shift to sustainable practices (Auld & Gulbrandsen, 2010).

Scholars have examined if and how third-party certifications enhance accountability for stakeholders aiming to make gains toward a particular goal (see, e.g., Cashore, 2002). They have also explored how relationships within a food system are transformed as stakeholders engage with third-party certification processes (see, e.g., Foley, 2012; Lyall & Havice, 2019). Researchers have found that universities, specifically, can struggle to meet a goal that is set and monitored only via internal mechanisms, especially when it is a nonbinding declaration

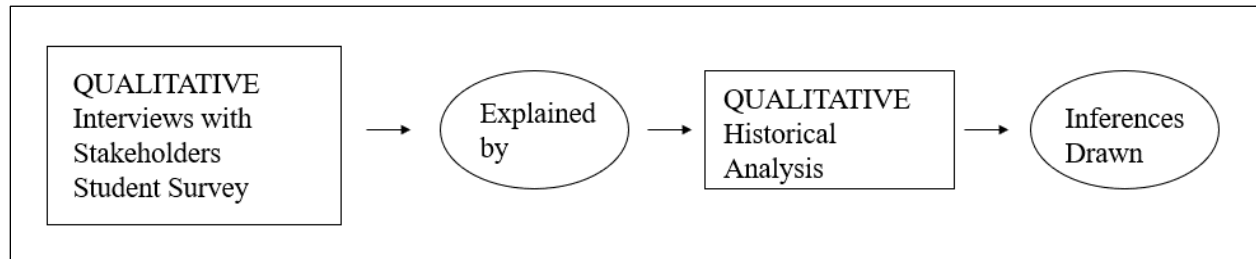
(Bekessy et al., 2007). In some cases, universities have turned to third-party certifications and purchasing audits that develop defined metrics and include consistent monitoring to provide accountability and transparency for maintaining progress toward goals (Bartlett, 2011). Furthermore, community members can propose a commitment to a third-party certification through grassroots movements, which, according to Bartlett (2011), may be the best way to hold universities accountable, initiate institutional contracts, and achieve sustainability goals such as supporting local farmers. However, there is little attention to how stakeholder relationships unfold from, and through, commitments to third-party certification schemes aimed at enhancing campus dining sustainability.

Our research brings together these three areas of analysis through a case study of UNC’s efforts over a 10-year period to enhance sustainability in its campus dining system. We explore how UNC’s Carolina Dining Services (CDS) has engaged with foodservice companies, community stakeholders, and a third-party certification body to establish and monitor sustainability goals. Our analysis provides an empirical example of how one university navigates the competing pressures and interests among stakeholders, enriching the literature on institutional commitments to sustainability in the university setting.

Methods

We employed a mixed-methods approach that included document review, semi-structured interviews, a survey, and participant observation. Our interview and survey methods were approved by the Institutional Review Board (IRB#19-2557) and were undertaken and completed by an undergraduate research team. The project culminated in the report entitled “Sustainability in the UNC Food System, 10 Years On” (Alanis et al., 2020). Three of the authors on this paper were involved in the research team that produced the Alanis et al. report, and this article builds from and expands on that research.

We utilized a convergent study design (Creswell, 2015) that combined mixed qualitative methods with historical analysis to contextualize the results (Figure 1).

Figure 1. The Mixed-Methods Approach Utilized in this Study

We conducted 13 in-depth, semi-structured interviews with stakeholders internal to the UNC food system as well as external to UNC but with direct experience in university efforts for sustainable food. We began with interviews of internal stakeholders active in CDS's work with RFC and used snowball sampling to identify actors involved in initial engagements between UNC and RFC in 2008 and to identify additional community stakeholders. We interviewed personnel at CDS, in senior administration at UNC, and staff working on sustainability initiatives at UNC (see Appendix A). Interviewees are cited with SX, X being a number that coincides with their information in Appendix A. To analyze the interviews, we created a codebook of keywords, themes, and actors that we highlighted in the interview transcripts using both keyword coding and emotion coding (Saladaña & Omasta, 2018). Keywords included "local," "cost/price," and "standards"; themes include "exasperation," "perceived success," and "student action"; and actors include "Aramark," "students," and "farmers/producers." These keywords were decided deductively and then we noted where certain words appeared close to each other and how keywords and actors appeared in relation to themes. We used this data to analyze the change in relationships over time with regard to sustainable food at UNC (Dunn, 2010).

Concurrently, we surveyed a subset of the UNC student community to gain an understanding of student values related to campus dining and current knowledge and attitudes toward RFC. These surveys were a convenience sample and were distributed through department listservs at UNC, primarily within the departments of geography and environmental studies, because our faculty advisors had direct access to them. The most represented

majors on the survey were biology, business, environmental science, environmental studies, geography, global studies, and political science. We received 238 responses in total, and of those, 234 identified as UNC students and four identified as faculty. No responses were removed in order to maintain a wide perspective. With the rapid turnaround time for the survey, we could not achieve a representative sample of the entire UNC student body, and we did not collect typical demographic information; however, students sampled were equally distributed across the four-year average graduation timeline and 88.4% of the sample either currently had a meal plan or previously had a meal plan, making the sample a general indicator of student opinions. Therefore, while the sample is not fully representative, it does provide a snapshot of UNC students who currently or previously had a relationship with dining at UNC.

Following analysis of these two elements, we analyzed 10 years of reports covering CDS purchasing and progress toward reaching defined RFC sustainability goals; the reports enabled us to track changes to procurement practices as well as the elements of the RFC definition of sustainability.

UNC-CH Carolina Dining Services and RFC History

Under usual (nonpandemic) circumstances, UNC's CDS serves more than 16,000 meals per day during the fall and spring semesters. CDS entered a contract with the foodservice corporation Aramark in August 2001; it is renewed every 10 years, and UNC renewed in 2011 and 2021. The push for CDS to make explicit commitments regarding sustainability emerged in 2008, when undergraduate students involved with the student-led campus food group Fair, Local, Organic (FLO) turned their

attention to the sustainability of UNC's institutional food purchasing (Hannapel, 2016). FLO members were concerned particularly with the environmental sustainability of food in the dining hall and were interested in using UNC's institutional purchasing power to support the community of sustainable farmers in North Carolina (NC). NC is one of the top 10 agriculture-producing states in the United States (U.S. Department of Agriculture Economic Research Service [USDA ERS]), and in 2016, NC had 14,217 certified organic farms (USDA National Agricultural Statistics Service, 2017). Sparko and Kneece (2019) found that organic farms in NC were growing in both quantity and revenue. Students saw sourcing from local NC farms as an attainable goal given the significant number of farms.

Members of FLO began interacting with founding members of RFC (see Box 1) in 2008. From this relationship, UNC FLO members partnered with CDS in fall 2010 as one of a few campuses to pilot the RFC calculator; this partnership was facilitated as an internship through (what is now) UNC's Environment, Ecology, and Energy (E3P) Department (Fleishman & Skelton, 2010). Beginning in 2011, RFC began to develop its Real Food Challenge campaign, which aimed to develop a formal standard that could be used by campuses across the U.S. Meanwhile, on UNC's campus, FLO began to develop a broader political consortium to encourage the university to commit and formally sign onto RFC, which would require the university to buy 20% "real food" (Box 1) by 2020 (Fleishman, 2012; Gontaruk, 2011). UNC administration did not commit to RFC in 2011 or 2012, stating that criteria for "real food" were not fully developed (Quine, 2012). However, UNC administration and CDS personnel began to put the audit practice in place, and these events sparked a dialog among students, CDS, Aramark representatives to UNC, and administration (Atkinson et al., 2012; Balderas et al., 2011; Hannapel, 2016).

Although UNC had not made a formal commitment to RFC, CDS continued to work with Aramark to shift procurement and worked with student interns to conduct regular audits to assess progress toward "real food" purchasing and develop an accountability mechanism. Despite not having signed

the Real Food Challenge, each semester a team of student interns audited one month of all dining purchases in the two large dining halls (Lenoir and Chase) using the Real Food criteria (Aspell et al., 2015; Corrigan et al., 2013; Green et al., 2015; Huber et al., 2014). Through this process, a relationship among students, CDS, Aramark, and RFC was established and maintained. The audit process was (and continues to be) completed each semester by a team of three to four student interns in exchange for course credit. Students work closely with Aramark and CDS personnel to conduct the audit and share information on findings and potential new vendors. Students receive purchasing data from two main CDS dining halls from the previous semester for the month of February or September. For example, interns in the fall of 2018 received purchasing data for February 2018.

In 2016, students involved in FLO again asserted that the time was right to formally commit to RFC, and UNC's senior administration officially signed the Real Food Commitment (Bielitz, 2016; Wakeman, 2016). By signing on, UNC agreed that 20% of dining hall purchases would meet RFC's definition of "real food" per 1.1 standards by 2020. Figure 2 visually illustrates the relationships this article has discussed so far that play important roles in institutional purchasing.

UNC's audited "real food" percentage has fluctuated over time (Figure 3). The overall increase from September 2010 to February 2015 occurred because CDS shifted purchasing practices to meet RFC standards. CDS's "real food" percentage doubled between September 2011 and September 2012 as CDS shifted its purchasing to American Humane-certified liquid eggs, organic chicken, fair-trade coffee, and some local cheeses (Atkinson et al., 2012). The increase from September 2012 to September 2013 can be attributed to the decision to purchase dairy from Maola, which at the time, met RFC's "local" criteria (Corrigan et al., 2013). The increase from September 2013 to February 2015 was due to an increase in purchasing of organic poultry, fair tea and coffee, and ecologically sound and local fish (Aspell et al., 2015). These shifts are evidence of CDS's efforts to transform purchasing practices to increase its "real food" percentage.

Box 1. The Real Food Challenge and its 2.0 Standards

The Real Food Challenge (RFC) is a national organization of student activists and institutional food sustainability professionals seeking to shift 20% of institutional food purchasing toward what they define as “real food.” They defined “real food” as local and community-based, fair, ecologically sound, and/or using humane practices in production (Abramovich et al., 2016). RFC converted these requirements into its Real Food Calculator, to which institutions can submit their food procurement data to determine what percentage of their total food purchases qualify as “real food.” Today, 274 institutions utilize RFC in 45 of 50 U.S. states.

RFC was formed in 2006, and thus the original development of the standards was over 10 years ago. The scope of this article examines the effect of the existing standards at UNC.

RFC's standards differentiate “green light” and “yellow light” “real food.” Green light “real food” qualifies as real and best represents the standards. Yellow light “real food” does not represent “the fullest expression” of the standard, but it still counts toward an institution's “real food” goal. The definitions of RFC's standards below describe the green light “real food” standards.

RFC's 2.0 definition of local food states that...

- The food producer must be privately or cooperatively owned.
- For produce, the farm must gross less than US\$5 million/year; for baked goods, beverages, dairy, eggs, grocery, meat, poultry, and seafood, the company or cooperative must gross less than US\$50 million/year.
- All production, processing, and distribution facilities must be within 250 miles of the institution.
- For multi-ingredient products, the company and at least 75% of the ingredients by volume must meet the criteria stated above.

To be considered fair, it must be certified by...

- Ecocert Fair Trade Certified
- Fairtrade America
- FairWild
- Hand in Hand
- Equitable Food Initiative.

To be considered ecologically sound, it must be certified by...

- Biodynamic Certified
- Food Alliance Certified
- Rainforest Alliance Certified
- Regenerative Organic Certified
- Salmon Safe
- USDA Organic

To be considered humane, it must be certified by...

- Animal Welfare Approved (AWA)/Certified
- AWA Grassfed
- Biodynamic Certified
- Global Animal Partnership Steps 4-5+.

RFC has a list of disqualifiers that immediately prevent a product from being counted as “real food.” The disqualifiers include “egregious human rights violations,” which include forced and prison labor, labor violations, concentrated animal feeding operations (CAFOs), genetically modified organisms (GMOs), and ultraprocessed foods.

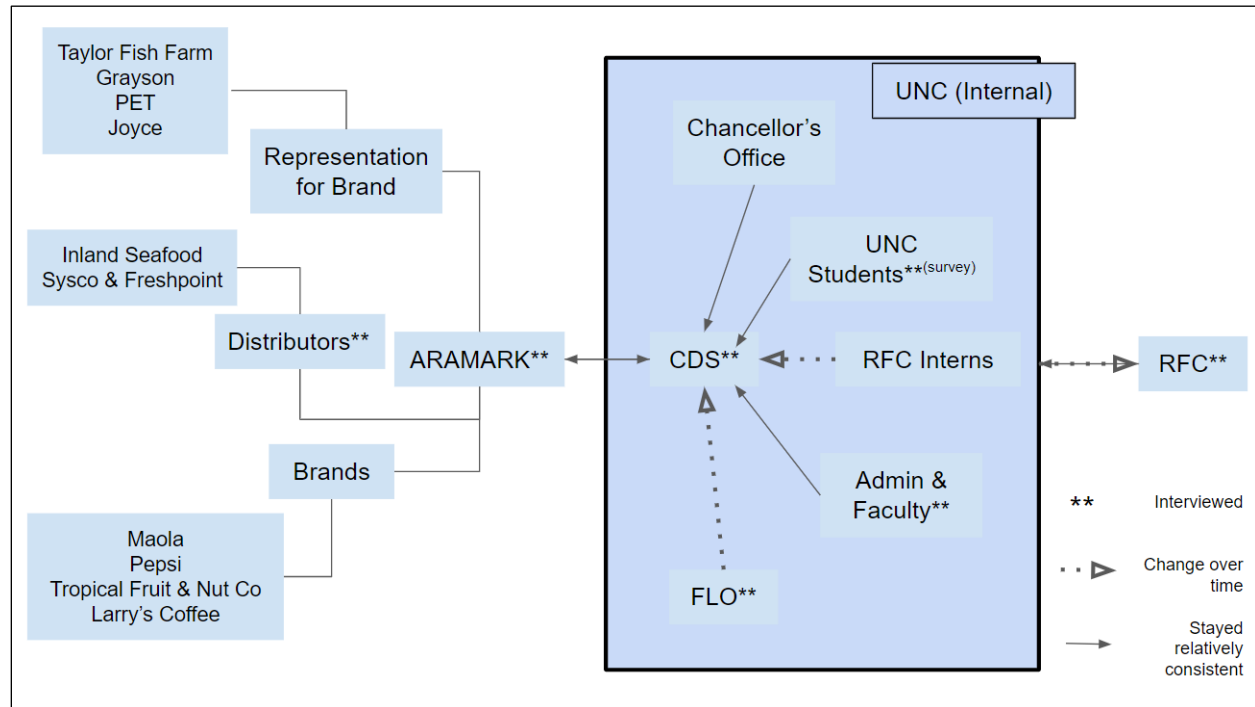
In October 2016, RFC modified its 1.1 Standards and created an updated version of “real food” criteria that it referred to as 2.0 Standards. The interns conducted the audit using an online tool designed by RFC that was automatically updated to 2.0 Standards, although UNC had only committed to the 1.1 Standards.

RFC did not share its plans to update its stand-

ard with CDS or UNC students in advance, and the new standard made several changes that affected CDS's “real food” percentage. This shift contributed to a decrease in CDS's “real food” percentage from September 2015 to February 2016. Instead of the new standard, Averbok et al. (2016) attribute the decrease to a difficulty in finding specific vendor data. The subsequent intern reports at-

Figure 2. Visual Depiction of the Interrelationships Explored in this Study

At the left side are external food producers. UNC sources from the producers listed (among others) via Aramark, which holds the contract with UNC to run the dining halls. The middle of the graphic, in the blue square, shows groups internal to UNC. The dotted arrows indicate that we noted considerable change over time in the nature of those relationships. The far right side of the graphic shows RFC: the double-sided arrow represents that from RFC's perspective, the relationship with UNC has stayed consistent. From UNC's perspective, the relationship with RFC has evolved.

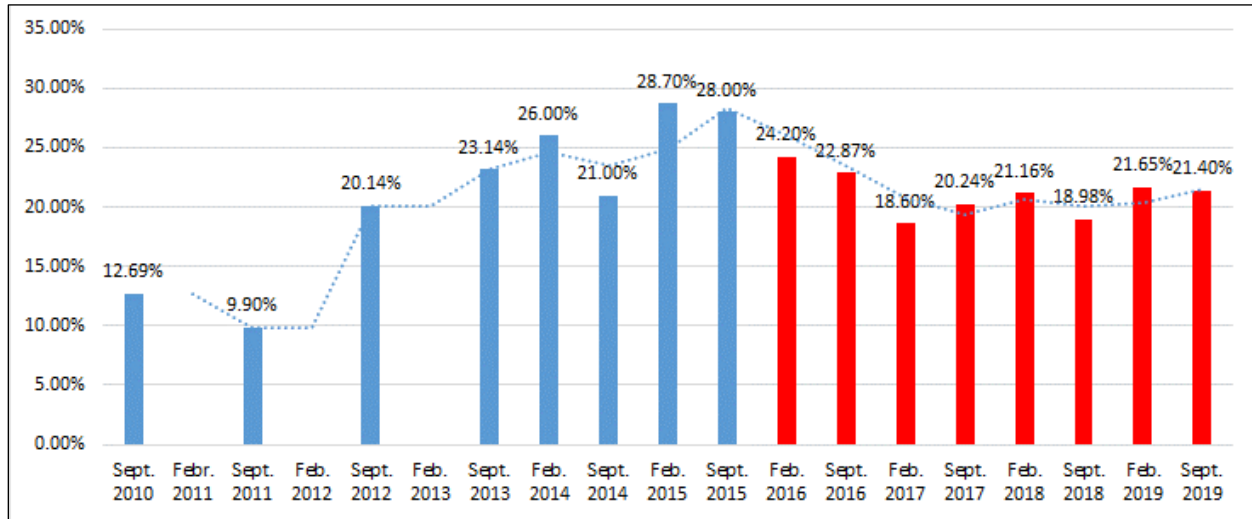


tribute the “real food” decline to details like changing vendors, misunderstandings on verifying with RFC whether brands counted as “real” or not, and the inability to find certain data that could verify “real food” status. During this time, interns and CDS also discussed the implications of one of the changes in the shift from 1.1 to 2.0 standards: the new standard specified an income cap on farms to qualify as local, meaning if they exceeded a certain income, they were not considered local. This disqualified many potential local vendors from “counting” toward CDS’s commitment. In sum, several factors influenced the decline in 2016: the shift from 1.1 to 2.0 Standards disqualified certain vendors; CDS purchased a select quantity of “sustainable” foods that met certain standards (e.g., produced by a B Corp) but did not comply with RFC’s standards, and potential local vendors were disqualified for having too much income; and, as with all semesters, the variable nature of vendors, food availability, and distribution options.

As CDS sought to meet its commitment to sustainable purchasing, RFC’s shift from the 1.1 to 2.0 Standards created significant frustration at UNC. UNC signed onto the RFC 1.1 Standards and made procurement changes to meet its commitment, only to have RFC change the standards without prior notification or consultation. Food systems are constantly evolving spaces; standards also evolve as standard-setting bodies such as RFC aim to meet new goals, achieve ongoing progress, and/or respond to new challenges in food systems. In our interviews, CDS personnel acknowledged this dynamic—as well as their own desire to continuously improve and innovate sustainability options—but expressed frustration that their hard work was undermined without at least being notified, if not consulted, in creating the new standards (S1 & S2, 2019). For example, CDS administrators lamented that RFC is “constantly changing the criteria” (S2, 2019) for “real food,” based on decisions that seemed to be made “in a vacuum with-

Figure 3. UNC's "Real Food" Percentage Since the Beginning of the Auditing Process

Prior to February 2014, the audit was only conducted for the month of September. Percentages correspond to the Real Food Challenge 1.1 Standards up until February 2016 (blue bars). February 2016 and forward correspond with RFC 2.0 Standards (red bars).



out a whole lot of institutional knowledge” (S2, 2019).

Early in the RFC process, tensions also emerged between FLO members and CDS when CDS cut contracts with a smaller-scale “real food A” producer abruptly in 2015. Students had negotiated a partnership between this producer and CDS starting in 2013 and were happy to offer the producer consistent purchasing (Hannapel, 2016). Students were frustrated when the contract was abruptly ended, because it denied the producer a consistent source of purchasing. CDS countered that given changes in prices and competitive pressures, they needed to be able to renegotiate, because sustainable purchasing progress had to function within their limited budget. To students, this highlighted an important limitation of the current third-party standards: CDS found another “real food B” vendor to replace the former vendor, keeping their overall “real food” percentage the same, though the original vendor was dismissed with an abrupt end to their contract.

In more recent semesters (fall 2018–spring 2019), CDS, Aramark, RFC interns, and student groups on campus began to revisit and engage in discussion about campus food sustainability goals. Stakeholder groups individually and collectively revisited the local food emphasis that drove the ini-

tial RFC commitment and identified limitations and benefits that the RFC third-party standard presents to a sustainable food vision at UNC. These issues emerged from several frustrations. For example, in the spring of 2019, UNC sought to purchase bread and other baked goods from a small, family-owned bakery outside Raleigh, NC (Cline et al., 2019). The flour used in the baked goods came from King Arthur Flour, a certified B Corp. B Corp is a third-party certification for companies that evaluates their “entire social and environmental performance” (B Lab, n.d.). Despite the bakery itself being local and the largest ingredient by volume, flour, coming from a B Corp certified producer, this bakery did not meet RFC’s “real food” criteria because the flour was not grown locally and the B Corp was not an RFC-recognized certification. Since the product line was both offered at a higher price point than conventional baked goods and would not contribute to the RFC commitment, it was deemed too expensive.

CDS and Aramark representatives began to voice frustration and ask RFC for clearer communication and advanced notice regarding potential changes to the standard. In annual check-in calls with RFC, RFC representatives urged student interns and faculty coordinators to begin working toward higher “real food” percentages, but were re-

sistant to discussing the constraints—such as budgetary limits, tradeoffs between “real food” purchases and maintaining worker wages, seasonal variation of local “real food” products in NC, the ways that changes to standards could disqualify vendors that UNC stakeholders were interested in supporting, and the reality that students also desired many non-“real food” products (Participant observation, 2019). Aramark and CDS personnel began to openly question if the RFC tool was the best approach for meeting campus food sustainability goals; some went as far to suggest that perhaps it was time to abandon the RFC commitment in favor of developing and monitoring a standard internally (observation, intern report meeting, spring 2019).

To address these difficulties, students and faculty who had been involved in the RFC audit process formed a research team consisting of undergraduate and graduate students and two faculty members with a goal of taking stock of UNC’s food system sustainability approach to inform its future direction. These efforts resulted in a report entitled “Sustainability in the UNC Food System, 10 Years On” (Alanis et al., 2020); the methods and results of that report contribute to this article’s conclusions.

Stakeholder Influences on Sustainability Commitments

In this section, we draw on interview and survey data to discuss the perspectives of an RFC staff member, Aramark, CDS, and UNC staff and faculty, and student opinion, to better understand what roles stakeholders and stakeholder relationships play in driving campus sustainable-food commitments and how a reliance on third-party certifications influences university food purchasing. Our analysis of perspectives and transformations reveals that new relationships emerged as a result of UNC’s commitment to a third-party certification.

Heterogeneous Expectations and Stakeholder Interests

Real Food Challenge

An interview with a staff member at RFC illus-

trated that RFC’s central concern is the ever-changing nature of the food system. Its aim is to keep the standards focused on the core principles of local and community-based, ecologically sound, fair, and humane agricultural production. RFC envisions continuing to develop its standard through an “iterative process” that focuses on looking “at the food system in a more holistic way” (Personal communication, 2020). RFC recognizes that the food landscape is constantly shifting and third-party standards must change in response.

RFC indicated that in its day-to-day operations, it tends to focus more energy on universities that are just starting out, because they may need more guidance with learning the tools and standards. The representative described UNC as “one of the most active signatory schools” in terms of being engaged and knowledgeable about the audit process. The interviewee also stated that “we see ourselves as the organization that sets the standards, that maintains those standards, so that universities and other institutions can just focus on the food procurement side, they don’t have to do the back-end research” to develop the standard. This leaves institutions committing to the standard to complete the research aimed at identifying and verifying vendors that meet RFC standards (2020).

Interviews with community members who pushed for UNC to adopt the RFC standard revealed that in the early 2010s, there was lively collaboration and regular communication about the standards and their application to UNC between the UNC community and RFC. At present, stakeholders outside RFC perceive that communications have become less frequent and more automated. UNC stakeholders now receive form-letter emails and instructions, and they experience the audit as task- and compliance-oriented. However, the RFC interviewee also noted that “collaboration is definitely the type of relationship we want to hold” (2020). The RFC interviewee emphasized that one of the goals of the standard is to have consistent requirements across the board, but that RFC also wants to “encourage schools to think about their own values around food” (2020). RFC indicated an openness to conversations regarding exceptions for certain products or working together to think about metrics for products that may be considered

sustainable but are not within the specifications of the standard.

UNC Faculty and Dining Administration

In committing to RFC's standards, CDS has become accountable to a specific set of procurement commitments for 10 years. In this period, stakeholders including UNC faculty, administrators, and students have formed opinions about what UNC's food sustainability priorities should be and how CDS might achieve them in the future. While each interviewee had a unique opinion, many were united around the goal of purchasing more local food.

A current administrator involved in the origins of the RFC commitment expressed frustration with the lack of transparency and flexibility from RFC. When considering how best to move toward sustainable purchasing, this administrator focused on how purchasing could be "generative" of sustainability goals. To them, a generative process would mean that purchasing pushes individual vendors toward sustainable practices and, in doing so, increases pressure on the whole food system to become more sustainable (S4, 2019).

Another faculty member argued for more community involvement in decision-making about campus sustainability decisions, and emphasized that campus sustainability programs should also include educational elements such as teaching campus community members about waste and nutrition. This person believed that encouraging people to eat a healthier, Mediterranean-style diet would drive purchasing toward more fruits and vegetables and away from meat and processed foods (S14, 2020).

An administrator involved with sustainability felt that the best way to achieve sustainability would be to take all the different stakeholder opinions and from these, designate "sustainability dreams" that would be the basis for creating a concrete set of goals. This stakeholder also stated that carbon footprint will need to be prioritized in any discussion of sustainability because climate change is a major topic of conversation in the present day (S8, 2019).

Many UNC faculty and CDS representatives were of the opinion that local purchasing should be

CDS's top priority, with one stating that "North Carolina food should come first" (S2, 2019). Our analysis of interviews showed frequent occurrence of the keywords "local" and "North Carolina," as well as mentions of various NC farmers, producers, and suppliers. Many stakeholders emphasized that the 2.0 Standards placed too many limitations on local purchasing. For instance, one insisted that "restrictions on the size of a farm are just ridiculous" (S2, 2019). But definitions of "local" were controversial among the group members. For instance, one administrator believed that "the university should get credit for buying product from Smithfield" due to the fact that the large meat-processing corporation "employs a lot of North Carolinians and pays a lot of North Carolina taxes" (S2, 2019). This opinion is at direct odds with RFC, which expressly restricts food produced by CAFOs (concentrated animal feeding operations) like Smithfield from achieving "real food" status. Many other stakeholders envisioned using university purchasing to support smaller local producers, rather than large firms like Smithfield. The stakeholders' idea that UNC should use its purchasing power to generate economic activity in the state was shared across stakeholder groups, including UNC administration and faculty and representatives from other similar universities, though the definition of "local" remained contested.

Students' Opinions

A recent study at two dining halls at University of Wisconsin-Madison found that 50% of student survey respondents ranked sustainability initiatives as important in dining purchases (Silva et al., 2020). The UNC student survey aimed to understand the knowledge and opinions regarding sustainable dining of the larger student body. The survey ($N=238$) asked respondents, 234 of 238 of whom identified as UNC students, to rate the importance of the following factors in campus dining sustainability priorities: Nutrition, Workers' Rights (farmworkers, foodservice workers, etc.), Affordability, Food Waste, Ecological Sustainability, Quality of Options, Local Food, Student Involvement, and Animal Welfare. Respondents ranked workers' rights, ecological sustainability, and nutrition as their top priorities for campus dining, and they listed local

food and student involvement as moderately important (Figure 4). A large majority of surveyed students believed that CDS has a responsibility to provide sustainable food (95%) and that CDS makes sustainability a priority (58%). However, only 16% of students were aware of the CDS commitment to RFC, with another 13% of students stating they had heard of the commitment but did not know what it was. This shows a disconnect between CDS's sustainability efforts and students' knowledge of them.

"Local" food was a key focus of student activism leading to the RFC commitment and has remained a priority for stakeholders in administrative roles; however, the student survey revealed that the majority of respondents believe that "local food" is only moderately important, especially in comparison to other factors such as workers' rights and ecological sustainability. While a small, focused group of student activists (FLO) oriented CDS toward RFC and a focus on local procurement, at present, the larger student body places more value on other components of sustainable dining. These priorities include nutrition and food waste, neither of which are core components of RFC. The implications of this may be that the university is more responsive to small, focused, committed groups of students and may have difficulty gathering and

acting on information from the larger student body.

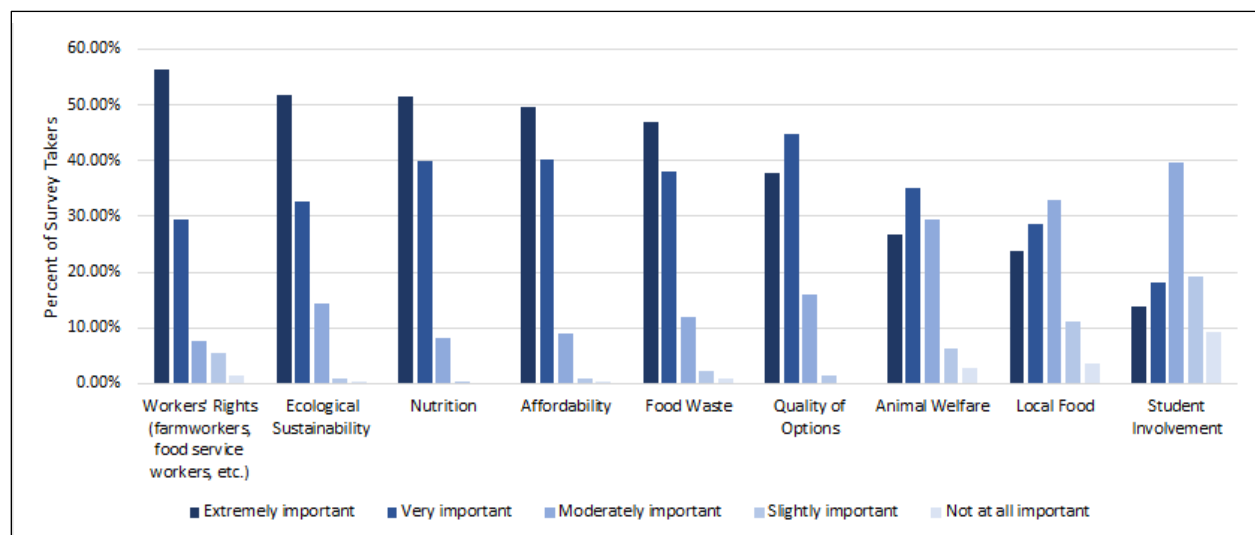
Effects of a Third-Party Certification

Cascade of New Relationships

Analysis of RFC audits and audit reports, as well as interviews and participant observation over 10 years, reveals that new relationships emerged from committing to RFC. The collaboration that formed among CDS, Aramark, and sustainability-focused students is the most significant element of the collaboration because of the positive, continuous communication and strong working relationship that grew over time. This resulted from two factors. The first is the trust and collaboration that built over 10 years as CDS, Aramark, faculty, and undergraduate students worked together to complete the auditing task, troubleshoot data challenges that emerged, and identify potential suppliers that could generate more RFC-eligible purchasing. The second emerged as these stakeholders navigated and addressed the tensions and frustrations associated with the limitations of the RFC standard, the unannounced changes to the standard, and the limited success in nurturing constructive communication between UNC stakeholders and RFC personnel.

Figure 4. Ranking of Students' Values

Students were asked to rank the nine categories by level of importance. Most often, students ranked worker's rights, ecological sustainability, nutrition, affordability, and food waste as extremely important.



As student interns and CDS encountered these challenges, they found themselves united in the goal of collectively advancing food sustainability on campus. One intern described their experience working with CDS as “pleasantly surprising. I expected to come in and have to fight CDS to purchase sustainably, but I found that they were already very focused in their pursuit of sustainable procurement” (Student intern, May 2019). This feeling of surprise shows the evolution of the relationship between students and CDS and Aramark. When FLO was urging CDS and UNC to sign the commitment to RFC, FLO members described a feeling of fighting against CDS and university administration (Hannapel, 2016). By the late 2010s, sustainability-focused students, CDS, and Aramark personnel were aligned, and at times aligned around their frustration toward RFC. This shift transpired as UNC deepened its commitment to RFC.

In spring 2019, CDS stated its interest in finding an approach to sustainable procurement that it could use instead of RFC, and expressed interest in potentially developing an internal standard that could reflect UNC’s goals. To help inform this decision, the undergraduate research team (see above) identified and explored available approaches to standards that could serve as alternatives to RFC, such as the Good Food Purchasing program, Aramark’s Green Thread, AASHE’s STARS, the Cool Food Pledge, and Menus of Change. After examining the primary goals and reporting methods of the alternative standards, RFC emerged as the most robust option. The alternative standards offered less specific requirements and spanned fewer areas of interest (Alanis et al., 2020). Furthermore, the students explored other university systems that had developed internal standards and reported to CDS and Aramark that while this approach could create a standard customized to a particular institution, it is a resource-intensive process, lacks an external audit process, and raises questions about how to ensure the legitimacy of the standard in the long term (S7, 2020). The students presented these conclusions to CDS and Aramark and despite not finding an alternative as requested, the students, CDS, and Aramark learned that RFC is a thorough, well-developed program that creates a common goal for

sustainable food stakeholders at UNC. To date, CDS continues to maintain its RFC commitment.

Formalizing RFC in Aramark Contract

A theory of change associated with third-party certification is that large institutions can shift institutional practices and drive change throughout supply chains by committing to sustainable procurement. During the first 10 years of the RFC commitment, CDS and Aramark worked collaboratively to meet the RFC commitment. Aramark sought out farmers, suppliers, and distributors that complied with RFC standards so UNC could increase its “real food” percentage. However, the commitment was made by UNC, not Aramark, and in 2021 CDS re-opened its bidding process for a foodservice supplier. UNC eventually renewed its contract with Aramark, and the new contract included an explicit commitment to RFC (see Appendix B for Section 5.13: The Sustainability Plan). This move signals a deepening of the relationship between CDS, Aramark, and RFC, and a formalization of commitments to sustainable purchasing upstream in the university food supply chain. While the commitment was initially made at the “end” of the foodservice chain (UNC/CDS), the formalization moves it up to the institutional node of the chain.

Conclusion


This paper draws on UNC’s experience with RFC to explore the roles that stakeholders and stakeholder relationships play in driving campus sustainable-food commitments and the effects that reliance on third-party certifications have on campus food purchasing and community relationships. Our findings suggest that stakeholder relationships drive and are transformed by efforts to shift toward more sustainable food purchasing. Scholarship in the field highlights that understanding institutional food-purchasing decisions in the university setting requires analytical attention to the role community stakeholders play in setting and achieving sustainability goals. This article sought to explore the relationships among the various stakeholder groups and how they developed over time. At UNC, a small, vocal group of students (FLO) was able to generate political will to improve sustaina-

ble dining, in part by identifying a third-party standard that could provide a transparent framework for defining and measuring progress. Our survey found that the sustainability goals of the general student body focus more on nutrition and food waste as opposed to FLO's goals of local food. Other stakeholders, like faculty, have their own ideas about how UNC should proceed with sustainable procurement but can disagree over concepts like the definition of "local." Findings suggest that smaller, focused groups of stakeholders can influence sustainable food commitments, but that the broader community might have a wide range of sustainability concerns that change over time. Finding standards that can capture these distinct interests is challenging.

By committing to a third-party certification, CDS required Aramark to change its own purchasing priorities. This involved working closely not only with student interest groups but also with upstream food-supply companies to identify and source products that complied with both the RFC standard and CDS's budget. It also involved a firm and public commitment to a clear (if changing) definition of "real food" and transparent auditing procedures that involved students and created a stakeholder community committed to working together to meet the standard. Where initially students worked closely with RFC to drive change at the university level, over time these alliances shifted. Once UNC committed to RFC, CDS and Aramark worked together to add the sustainability commitment to their procurement priorities. Even before the formalization of RFC in the Aramark-UNC dining contract, CDS and Aramark personnel collaborated and worked carefully and creatively to meet the commitment. This finding is consistent with other studies that have found that universities can push foodservice companies toward sustainable purchasing (Goger, 2019; Klein, 2015; Louie, 2019), and the case at UNC provides more evidence to support that theory.

One of the key community effects of being committed to RFC is the development of the working relationship among students, CDS, and

Aramark personnel. The relationship grew to be constructive, collaborative, and focused on conducting the audit and discussing the strengths and limitations of the RFC standards. Students gained an appreciation for the complexity of sustainability transitions. CDS and Aramark constructively engaged and appreciated student interns' work as researchers and resources for finding new suppliers. Students, CDS, and Aramark personnel became increasingly allied over frustrations with RFC for changing the standards and over the lack of engagement and network-building across universities. At the request of CDS, students evaluated alternative third-party standards and found that RFC emerged as the most comprehensive and robust standard. UNC remains committed to RFC, which is now formalized in the contract with Aramark. The future of the sustainable food movement at UNC may well continue to evolve through the strong communicative relationship among sustainability-focused students, faculty, CDS, and Aramark personnel who work together around the RFC audit.

This analysis offers a detailed case study of a large university's work to shift to sustainable food procurement. It demonstrates the importance of stakeholder relationships in the pursuit of sustainable food purchasing and suggests that community relationships are a key site of investigation for understanding institutional sustainability commitments. Future research in this area might include analysis at different types of institutions, such as hospitals and prisons, to examine the particularities of the stakeholders and community relationships that drive and are transformed by the sustainable food movements in those spaces. 

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Appendix A.

Table A1. Interviews by Interviewee Type

Informant	Internal to UNC-CH or External	Admin/Faculty, Student Organization, Community Organization, Similar Institution, Foodservice Company
S1	Internal	Foodservice Company
S2	Internal	Foodservice Company
S3	Internal	Student Organization
S4	Internal	Admin/Faculty
S5	External	Similar Institution
S6	External	Foodservice Company
S7	External	Similar Institution
S8	Internal	Admin/Faculty
S9	External	Similar Institution
S11	External	Similar Institution
S12	External	Community Organization
S13	External	Similar Institution
S14	Internal	Admin/Faculty

Appendix B. Section 5.13 of Contract between UNC and Aramark

Section 5.13. Sustainability Plan: Supplier will establish and maintain a comprehensive and proactive Sustainability Plan for the Program that supports University and University's sustainability objectives. The Sustainability Plan will be developed collaboratively with, and subject to the approval of the Contract Administrator.

- A. The Sustainability Plan should consider:
 - 1. Minimization of environmental impact through the effective use of ecologically sustainable growing techniques, integration of seasonally available local foods, and energy efficient transportation from farm to table. Supplier and the Contract Administrator will agree to annual target objectives for the following, with year over year improvement expected:
 - a. Use of foods that qualify as Real Food as outlined by the Real Food Commitment.
 - b. Supplier will work to identify and bring into its supply chain historically underutilized business, including Black, Indigenous, and People of Color "BIPOC" farmers in North Carolina, through the following initiatives:
 - i. Provide a one-time [US]\$10,000 grant to third-party non-profit whose work focuses on bringing BIPOC farmers into the larger food supply chains.
 - ii. Host roundtable co-facilitated by Center for Environmental Farming Systems (CEFS) focusing on historically underutilized business farmers, including BIPOC farmers, to identify opportunities to collaborate with them.
 - iii. Develop training course supported by the North Carolina Extensions' Committee on Racial Equity in the Food System and Soul Fire Farms, two organizations who are leaders in this area.

Growing health: Building partnerships in healthcare and food systems for improved food access in Appalachia

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Abstract

Hospitals not only provide access to healthcare services in rural areas; they also serve as major employers and economic drivers. The goal of this pilot study was to improve our understanding of how a rural healthcare system in Appalachian Kentucky

could be leveraged to expand access to fresh fruits and vegetables. We conducted 11 semi-structured interviews with food system and healthcare stakeholders in Hazard, Kentucky, to (1) improve our understanding of key barriers to accessing and utilizing fresh produce for healthcare worker and patient populations, (2) identify models for direct-to-consumer market channels and farm-to-institution programming in collaboration with a local hospital, and (3) explore the potential of those models to

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foster greater consumption of fruit and vegetables among community members.

Stakeholders emphasized the need for staff support and funding during program development and discussed the difficulty in maintaining prior local food and health promotion efforts when pilot funding expired. Other considerations included the importance of community ownership, robust communication and coordination among stakeholders, and attunement to the opportunities and challenges of a hospital-based approach. Direct farm-to-consumer models were considered feasible but would require accommodation for low-income consumers, such as vouchers, sliding-scale payment methods, or “double dollar” programs. Farm-to-hospital initiatives were discussed in the context of the COVID-19 pandemic and reduced hospital cafeteria usage, which may limit the success of some events but highlights the potential for to-go options such as pre-prepared salads, lightly processed snacks, and medically tailored meal kits.

Results of this study illustrate the challenges and opportunities of leveraging a rural hospital as an anchor institution for expanding local food system development in rural Appalachia. This study also offers insights into the intersections of health, culture, and economy in an Appalachian community, and provides a framework for expanding local food system initiatives.

Keywords

Rural, Farm-to-Institution, Social Determinants of Health, Prevention, Procurement, Hospitals, Appalachia

Introduction

Healthcare-based local food systems initiatives have grown rapidly across the U.S. in recent years. These initiatives typically emphasize improved health through the introduction of fresh, local produce, which may help prevent the development of chronic diseases such as diabetes, heart disease, and cancer (Aune et al., 2018; Diener & Rohrmann, 2016; Esmailzadeh et al., 2006). These initiatives range from lunchtime vegetable specials in the cafeteria to federally funded produce prescription programs (Aucoin & Fry, 2015; Dolstad et al., 2016; Raison & Scheer, 2015). The largest U.S. healthcare

system (Kaiser Permanente) even hosts farmers markets on its campus (Crompton et al., 2012). Beyond patient care, farm-to-healthcare initiatives serve as a driver for the growth of local food economies and the expansion of access to fresh and seasonal foods for healthcare workers and the broader community (Bryce et al., 2017; Buyuktuncer et al., 2014; Forbes et al., 2019; Hileman, 2021; Joshi et al., 2019).

In Appalachian Kentucky, healthcare systems are one of the largest sources of employment and serve as hubs for social and economic activity (Kentucky Center for Statistics, n.d.). Recent research in the region indicates the potential for healthcare systems to serve as sites that expand both local food system development and improved access to fresh fruits and vegetables. Transportation is a key barrier in central Appalachia, where the distance between locations is compounded by the mountainous terrain (Schoenberg et al., 2013). Fresh food tends to cost more than the national average due to the costs associated with transporting it into the area and the distance consumers must travel to reach fresh food sellers (Suarez et al., 2015; U.S. Department of Agriculture, 2014). For these reasons, healthcare organizations can be natural allies to agricultural and local food enterprises. Hospitals are more centralized and familiar and may provide the initial investment (of time, money, and space) necessary to implement a decentralized model to improve access to fresh and local food.

Through the work of multiple community-based organizations, initiatives, and individual consumer demand, the region has experienced growth in demand for locally raised, healthy food in farmers markets, restaurants, and independent grocery stores (Hindman Settlement School, 2017; Jones, 2017; Kentucky Department of Agriculture, n.d.; Kentucky Department of Tourism, 2018). Researchers studying opportunities for local food economies in the region found growing demand for local food, a robust pool of established and emerging farm operations, and a significant amount of underutilized farmland currently in hay production (Rossi et al., 2018). Expansion of small-scale local production focused on consistent supply to even one wholesale or institutional customer has

the potential to increase regional capacity.

At the same time, researchers in the region have found that food insecurity consistently ranked as a pervasive social need for Medicare and Medicaid beneficiaries in the region (Kentucky Consortium of Accountable Health Communities). These findings align with national data that indicate food insecurity in Kentucky (14.4%) outpaces that of the United States as a whole (10.9%) (Feeding America, 2018). Taken together, low population density and limited transportation pose a particular challenge for healthy food access.

Despite challenges in addressing food insecurity, communities across Appalachia have a history of cooperative and innovative approaches to serving disadvantaged populations at the intersection of food and health. Building from an assets-based framework, leveraging the resources and opportunities embedded in regional anchor institutions is a key strategy for growing wealth in under-resourced and marginalized communities like rural Appalachia. The study presented in this paper had two goals: (1) to identify possible models for developing direct-to-consumer and farm-to-institution market channels in collaboration with a rural hospital, and (2) to foster greater fruit and vegetable consumption among community members. The data provide preliminary recommendations for how community health initiatives can integrate local food system partners in ways that honor community identity and foodways while providing healthful foods and growing regional economies.

Methods

This qualitative descriptive study (Sandelowski, 2000) was guided by a community-based participatory design to engage key stakeholders in the planning of a farm-to-hospital initiative. The purpose of the qualitative interviews and focus groups was to gather contextually rich insights from community members regarding opportunities and challenges relative to community food security and culinary skill-building. The semi-structured interview guide was adapted from

the USDA Community Food Security Assessment Toolkit (Cohen et al., 2002). The interview guide was reviewed and refined by the research team to fit the goals of the study and tailor it to the target audience. The study was approved by the University of Kentucky Institutional Review Board.

A focus group (N=10) was conducted with members of an advisory board for a separate study that targeted addressing the health-related social needs of community-dwelling Medicare and Medicaid beneficiaries in Eastern Kentucky. Participants in this group represented healthcare systems, Medicaid Managed Care Organizations (MCOs), community service providers, local public health departments, and community development initiatives and organizations.

Due to the ongoing COVID-19 pandemic, all focus groups and interviews were conducted via the Zoom video conferencing platform. Participants were asked to use video if they were comfortable to foster rapport and increase engagement. All interviews were recorded after verbal informed consent was obtained from participants. Due to the remote nature of the focus-group interviews, participants who were not comfortable with recording were told that they could leave the interview without any repercussions.

Data Analysis

Interview notes were compared against audio recordings to confirm accuracy and were then entered into NVivo (Version 12) for coding. An a priori coding schema was developed based on project priorities (Table 1). Three coders analyzed a single transcript and reached an average of 95% agreement across all codes. They were judged to have sufficient consistency to code the remaining interviews independently.

Table 1. Coding Schema

Realms of activity: How participants interact with the food and/or healthcare systems
General food environment
Community food system assets
Examples of successful initiatives
Causes, exacerbating factors and impacts of food insecurity in the county
Key challenges and bottlenecks for future food/nutrition initiatives
Areas for further research needed
Key considerations

Results

Participants described Perry County as home to an engaged, cooperative community with a history of obtaining grant funding and initiating food and health pilot programs to serve disadvantaged populations. Perry County has seen a movement toward local or healthy food in area restaurants and grocery stores, as well as programs that train and support community members as they learn to grow food.

Examples of successful initiatives reported by participants include a sliding-scale community supported agriculture operation (CSA), Farmers Market Double Dollars for Supplemental Nutrition Assistance Program (SNAP) beneficiaries, senior vouchers, pop-up farmers markets, cooking demonstrations, and farm-to-table dinners with varied pricing structures to increase access. Its primary hospital, Hazard Appalachian Regional Healthcare Regional Medical Center, has a history of food and health pilot programs, including an on-site farmers market, grocery store (during COVID-19), diabetes education programming, and collaborations with a local venture capital company, AppHarvest, to deliver fresh tomatoes to the hospital to distribute among patients, staff, and community members.

Such initiatives represent efforts and contributions from diverse sources and collaborations, including nonprofit and community organizations (e.g., Community Farm Alliance, North Fork Local Food), faith-based organizations (e.g., Food and Faith Coalition, local churches), city and county government, state agencies and health departments, area growers and local businesses, and a network of area primary care clinics that have been active in food security and social determinants of health. Importantly, there is also a deep bench of similar agencies and organizations in surrounding counties whose experience, insight, and skills can be leveraged to further the goal of expanding access to fresh, local foods for area residents. Examples of potential partners include healthcare organizations, nonprofits, institutions of higher education, farmer support and training programs, community kitchens and value-added or processing facilities, and fresh-food prescription and voucher programs. These organizations, and particularly one that is

among the largest employers in the area—the healthcare system—offer prime opportunities for partnerships and capacity-building to further expand access to fresh, local foods.

Opportunities and Visions to Leverage Existing Partnerships

Four interconnected opportunities and strategies were identified by participants. First, participants supported the location of the hospital as a focus of efforts to expand access to local food. Healthcare representatives specifically mentioned hospitals as resources and optimally situated to both get information “to patients about fresh stuff, about farmers markets, about the Kentucky Double Dollars program, and senior vouchers” and also to tap into federal dollars, such as Medicaid. Nonetheless, food system participants noted that past efforts to enhance access to local food did not engage industry settings such as hospitals or manufacturing facilities where employees congregate and may work long hours. One individual noted that doing so could help bridge the cultural “disconnect in the college domain and the working middle class” that has often existed in local food efforts.

Second, participants highlighted the importance of considering a “hub-and-spoke model” when thinking of a centralized hospital-based approach to expanding local food access. One participant suggested eventually expanding a hospital-based farmers market with dispersed minimarkets at primary care clinics to reach rural consumers.

Relatedly, participants also suggested that building on existing partnerships—including Cooperative Extension, older adult service organizations, community gardens, and county fairs—could help maintain community interest and ownership. In fact, leveraging such relationships was viewed as crucial to ensuring that the “spokes” of a hub-and-spoke model could be activated and community engagement maintained.

Finally, as funding was a perennial concern of all participants in their work to enhance healthy and/or local food access, they shared various ideas for payment and funding models that had been or could be used to overcome financial barriers. Some participants suggested developing diverse payment and funding models to ensure long-term inclusivity

and success. Examples included prescription programs (e.g., a Pharmacy program); vouchers funded through employee benefit and wellness programs, community foundations, or payors (e.g., MCOs); and sliding-scale markets with voluntary designation by participants into tiered payment categories. Policy change was cited as a potential method of expansion, not only in the funding arena, but through the expansion of federally funded benefits—such as SNAP—to pay for CSAs or meal kits.

Challenges with Enhancing Access to Local Food

While recognizing the successes and positive effects of past and current initiatives, participants identified four areas of consideration for future efforts to increase healthy food access: funding, community ownership, communicating with and engaging key stakeholders, and considering the hospital-based approach. Each of these themes is discussed in more detail below. Table 2 lists additional challenges and considerations that were less frequently discussed by participants (that is, minor themes).

Funding as a Key Barrier to Food System Projects

Funding was the most-cited barrier to the implementation of food-related pilot programs. Healthcare stakeholders noted the importance of insurance reimbursement to the successful implementation and sustainability of programming. Over the past few years, interview participants observed the initiation of multiple local food programs, only to see the grant money run out and the program end. For example, a participant shared that “Around 2016/2017 [the schools] had a farm-to-

school program and the coordinating was driven by dedicated people. Eventually those people left, and the lovely grant money went away, so most of the program also disappeared.”

Related to that, stakeholders mentioned the need for a designated coordinator to sustain and grow programmatic efforts. Again, the reliance on grants, which often provide short-term funding for discreet efforts, could often provide an initial boost, but without long-term support, those positions could not be sustained.

Community Ownership of Project Development and Implementation

Stakeholders were adamant that growth of local food system efforts had to first take root in the soil of community. “One of the sensitivities [among people living in eastern Kentucky],” a healthcare representative stated, “is that people in the big city are coming to fix or save us.” In order for any initiative to have long-term success, one participated noted that “it has got to be theirs, and it HAS to be their energy and resources to keep it over time.” This sentiment was repeatedly vocalized. As a leader in local agriculture stated in an interview, “we have found natural connections that can make the program successful because people are invested [in] other participants.”

Other participants noted how “natural connections” are multiscalar. Conversations between community members form the first layer of connections, as word of mouth and social media spread excitement and invite participation. “I think it just keeps building off of the synergy,” a program di-

Table 2. Additional Challenges and Considerations

Evaluation and return on investment:

- Change in health outcomes is generally not feasible during the scope of typical evaluation efforts.
 - Lack of access to appropriate data (e.g., medical claims or patient health records) can limit evaluation efforts.
-

Access:

- Transportation is a major barrier across the region.
 - Broadband internet access is a major barrier to remote educational opportunities.
-

Relationships and partnerships:

- Community leader and advocate are needed to spearhead communication with community.
-

Grower considerations:

- Consumers may be unfamiliar with the seasonality of locally grown products.
 - Planning ahead is crucial so farmers can adjust their growing plans.
-

rector said, “and when people see their neighbors selling at the farmers market and talking to them, this is a hope story.”

Community ownership also develops via the relationships between community members and flagship institutions, such as churches and hospitals. As one participant stated, “churches are key here.” Others noted that engaging churches could be one way to extend the resources provided by the centralized hub to more rural community members who cannot reach it. Such an approach would not be without effort, though. “It would take someone being able to go out there,” one participant reflected, to “meet them where they are and talk with them.”

Participants also highlighted that community ownership could be facilitated by growing partnerships between institutions and community organizations and nonprofits. Community Farm Alliance (CFA), whose mission is to encourage and develop the feasibility of family-scale agriculture (Community Farm Alliance, 2021), and Grow Appalachia (GA), which seeks to create resilient and economically viable food systems (Grow Appalachia, 2021), were regularly mentioned in interviews and focus groups as key partners in the overall project. A program coordinator said that CFA and GA were great partners, then reflected: “They struggle with the same constraints that we are talking about. They have a lot of knowledge but not a lot of money.” They suggested that by leveraging hospital resources, they could expand collaborations to bolster the feasibility and success of local agricultural enterprises.

Communicating With and Engaging Key Stakeholders

Participants routinely reflected sensitivities to the perspectives and experiences of their communities when they spoke about their efforts to enhance access to local food. So often, investment in expanding food access is predicated on a desire to improve population health. As some participants, noted however, a focus on a disease state can be stigma-inducing and was therefore avoided:

The presentation of the material is not about participants having diabetes or heart disease.

We don’t like to say X county has the most heart disease in the state. We don’t want to impose stigma. We don’t want outside groups to come in and create an image of them that is not theirs.

Expanding outreach and communication activities beyond the early adopters or “joiners” of many local food initiatives was also noted as an important focus for many participants. As one community member noted, “people are on board [with farmers markets], but it’s the same people. We need to do better with outreach.” Indeed, one key strength of the hospital-based food hub approach was that it had the potential to bring healthy foods to individuals who may not have the time, transportation, or social connections to visit a farmers market, but who could benefit from the enhanced access to fresh food. Food system stakeholders commented on the growth of interest in marketing and buying local foods in the region. One program director reflected, “I don’t think everybody is out there searching for that local supplier,” they said, “but I think if it’s easy. ... I certainly think that we’re to the point now, in terms of the consumer mindset, they’re going to go local because everybody has been told enough that local is better.” In this way, trusted institutions, community organizations, and sites of local food purchasing can act (and have acted) as advocates of the local food system, extending their reach beyond the main stakeholders.

Education and Skill Development

Encouraging people to explore, cook, and eat different foods is seen by stakeholders as a challenge. A healthcare representative gave this anecdote as explanation. “A food truck came in around Thanksgiving and [one thing they gave out was eggplant] ... and the trash cans were filled with eggplant. Not sure if it’s a knowledge issue, maybe not knowing how to prepare [it]. There is a need to introduce people to how to prepare [vegetables] properly so they know how to enjoy it.”

Culinary enrichment activities, including sampling, cooking demonstrations, and skill building, were suggested as a means to move eggplants to a dinner plate instead of in the garbage. While partic-

ipants noted high demand for traditional Appalachian fruits and vegetables such as tomatoes, corn, and beans, introducing new ways of enjoying those foods was a challenge. “There’s a good market for traditional foods like sweet potatoes,” an extension employee shared, “We tried to look into new ways of preparing them, but it hasn’t caught on.”

Discussion

This study explores the opportunities and challenges of leveraging a rural healthcare system to expand community access to fresh local foods, informed by community stakeholders. Due to the inherent connection between food and health, healthcare organizations can be natural allies to agricultural and local food enterprises. Furthermore, hospitals are a major employer in the region. By partnering with local growers, hospitals can become sites of preventative health efforts for employees and the community at large as well as providing a direct link between patients, employees, and local growers. While the hospital as an employer offers the potential for employer-based vouchers to incentivize participation, the healthcare setting opens opportunities for reaching patient populations through fruit and vegetable prescription programs or other incentives. As part of an institution with considerable purchasing power and general funds, hospital dining services’ procurement provides a considerable avenue for a local food systems initiative.

While there was substantial support among participants for anchor institutions, such as rural hospitals, to serve as food hubs, participants suggested that a hub-and-spoke model was preferable to further expand access to fresh food among rural-dwelling residents. Transportation is a key barrier for many central Appalachia residents, where the distance between locations is compounded by the mountainous terrain (Schoenberg et al., 2013). Hospitals are centralized and familiar to many residents and may provide the initial investment (of time, money, and space) necessary to eventually implement a decentralized model to improve access to fresh and local food. Potential partners for hub-and-spoke activities may include primary care clinics, who serve as natural partners in preventive medicine, and also churches, which are often the

site of both information- and food-sharing (Schoenberg, 2017; Schoenberg & Swanson, 2017). Logistically, a decentralized model may be more complex, but it would further improve consumer access to seasonal produce.

The support of partnerships vocalized by participants extended beyond the hub-and-spoke approach, however, and extended to community ownership at multiple levels: community members who are excited to spread the word, institutions who can share information and leverage resources, and community organizations who can collaborate and build connections.

By building on existing relationships, Cooperative Extension Services, older adult organizations, county fairs, and community gardens could be valuable sites for information exchange. Suggested models to expand the inclusivity of programming included sliding-scale payments, fruit and vegetable prescriptions, and farmers market vouchers.

Substantive challenges to hospital-based local food initiatives included adequate and sustainable funding, although participants offered ideas for diversified funding streams, including employer-sponsored wellness initiatives and policy reforms to help reimburse efforts to address food insecurity. Even if fully funded, community ownership over programs through the input of community partners and advocates is crucial. Communication with stakeholders and the broader community are necessary to the success and adoption of the program, particularly to those most at risk or hardest to reach. The hospital-based approach provides benefits such as familiarity and serving as a natural ally to local agricultural enterprises via a commitment to preventative health. But it also includes challenges, such as the centralized location that may prove difficult for all rural residents to reach affordably and regularly. Additional challenges consist of how to evaluate the program to best show institutional return on investment, overcoming barriers to accessibility (including transportation and broadband internet), finding and building partnerships with key community advocates, and taking into account grower considerations such as seasonality and planning the growing season ahead of time.

Building ownership of local food initiatives in

a community requires thoughtful and inclusive outreach and communication efforts. As seasoned community representatives, participants offered nuanced insight into considerations associated with engaging hard-to-reach populations. For example, the proliferation of third-party certifications (e.g., Organic, Bio-Dynamic) and unregulated terms used for marketing (e.g., “natural,” “pastured”) has resulted in significant confusion and misinformation across all consumer groups. This confusion, along with the inevitable association of marketing terms with ethical and moral values, has resulted in sensitivities across the farm-to-table spectrum and some consumers to feel judged for purchasing food with or without certain labels. Designing markets in ways to maximize inclusivity and reducing unnecessary labeling may help.

Similarly—and in accordance with others’ research—our participants noted that individuals with lower incomes have food preferences just like everyone else, and will often exchange or return free food that does not align with their preferences (Dickinson, 2020; Fitchen, 1997; Kolavalli, 2019). Furthermore, local narratives of unappealing foods (such as trash bags full of eggplant) often take on lives of their own, shaping community food preferences over time. Such stories can be difficult to supplant and may require repeated exposure to positive experiences.

Unfortunately, food preferences cannot be “hacked” or “disrupted”—there is no technological fix for the social and emotional layers tied to everyday food consumption and lifelong preferences. However, the tension between diversifying crops and consumer demand can create a space for information exchange and an opportunity for communities to build initiatives that embody shared goals and values. Growers can learn what, from the perspective of the community, “must” be grown to honor local tastes and traditions, while customers can learn culinary enrichment skills that might—slowly—invite them to incorporate new foods.

This study aligns with previous research that demonstrates the benefits of increasing access and affordability of locally grown fruits and vegetables by a large employer (Alia et al., 2014; Backman et al., 2011; Saleh et al., 2010; Sorensen et al., 1999). Little research has been conducted on implement-

ing such preventative health programming in rural areas, particularly farm-to-hospital initiatives. By engaging with key stakeholders early in the development process, the research team can take critical challenges into account and operationalize potential opportunities.

Limitations

There are several potential limitations to the interpretation and representation of results in this study. First, these results may not be easily generalizable to other rural areas, even in the same state. Second, participants were largely stakeholders working in nonprofits and healthcare; while their insights are valuable to establishing a local food program, their knowledge is limited to their own experiences. In other words, they can only guess why and how people in their community purchase and eat locally grown produce. Third, social desirability bias is a natural limitation of focus group and interview research; the research team undertook every effort to make communication open and honest (Sriram et al., 2018). Strengths of this study include inviting the participation of a range of individuals from diverse institutional settings in eastern Kentucky early in the project development stage.

Implications

Results of this study illustrate the major challenges to and opportunities for implementing a farm-to-hospital initiative in rural central Appalachia. The use of clinic spaces to support farm-to-consumer enterprises is feasible and provides opportunities to expand institutional partner engagement as well as reach a more diverse consumer base—especially if customers could utilize sliding-scale payments and/or vouchers. Robust and sustainable funding is necessary to programmatic success, but participants were optimistic that exploring institutional partnerships and policy reforms allowing for reimbursement for social services (e.g., food access), could help diversify funding streams for this work. Additional considerations for programmatic success include outreach to hard-to-access, lower-income populations and the implementation of adequate evaluation metrics. A consistent, compensated staff position can help to improve communication between the institution and local growers.

Next steps will be to continue to develop a farm-to-hospital program with the continued guidance of a steering committee of stakeholders. It will seek to operationalize the available opportunities and work with community members to overcome challenges and barriers. This study suggests that a farm-to-hospital program could be successfully implemented in eastern Kentucky. In this way, hospitals can serve local communities as sites of preventive health.



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A food-system approach to addressing food security and chronic child malnutrition in northern Vietnam

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Abstract

Despite recent improvements in health, Vietnam continues to face significant problems with food security and chronic malnutrition among children. In the Northern Mountainous Region, small-scale

farmers and ethnic minority groups are particularly hit hard. Anemia is present in almost half the local population of children under two, and close to 20% of children experience stunted growth. Anemia and stunting can cause irreversible deficiencies

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Note

Ryerson University was recently renamed to Toronto Metropolitan University.

in learning and child development. Fortification of food products that are complementary to breast milk has been identified as an option to intervene and tackle chronic child malnutrition, particularly in situations requiring rapid results. Our paper describes how the ECOSUN project addressed food security and chronic child malnutrition in northern Vietnam (Lào Cai, Lai Châu, and Hà Giang provinces) using a food-system approach to design and implement a viable and sustainable value chain for fortified complementary foods. Through public-private partnerships, the project procured locally grown crops from small-scale women farmers to produce affordable fortified complementary food products in a small-scale food processing plant. Social marketing campaigns and nutrition education counseling centers supported product distribution through local vendors while emphasizing and promoting the value of fortified foods for healthy child development. The ECOSUN project also aimed to contribute to the broader goal of transforming the local economy. The process, lessons, challenges, successes, and methods employed to assess and test the delivery mechanisms of the project can offer insights to researchers, program implementers, and decision-makers involved in research-integrated development projects embedded in local socio-ecological systems.

Disclosures

The National Institute of Nutrition Centre for Scientific and Technological Service in Nutrition and Food (NIN FOOD) operates as a business subsidiary of the Vietnam Ministry of Health's National Institute of Nutrition (NIN). NIN FOOD specializes in the research, development, manufacturing, distribution, and sale of fortified foods, including a high-energy bar used to help treat severe acute malnutrition among children and adults, such as those living with HIV. While its business model ensures sustainability, it is ultimately guided by the mandate of NIN and the Vietnam Ministry of Health to work in the best interest of the people of Vietnam to promote their good health. It is also a member of the Scaling Up Nutrition (SUN) Network in Vietnam.

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Keywords

Purchasing Behavior, Food Security, Food-system approach, Local Food Supply, Malnutrition, Marketing and Distribution, Nutrition Education, Public Private Partnerships, Sustainability, Vietnam

Introduction and Literature Review

High economic growth and rapid reductions in poverty rates marked the past three decades in Vietnam. These advances are reflected in national health statistics, including the nutritional status of children. Between 1990 and 2016, stunting declined from 56.5% to 24.3%, while underweight dropped from 51.5% to 13.8% among children under the age of five (Berger et al., 2013; Ministry of Labour-Invalids and Social Affairs & UNICEF Viet Nam, 2017; National Institute of Nutrition, 2016; P. H. Nguyen et al., 2011). However, in recent years the rate of improvement in health has slowed, as more complex situations affecting remote and hard-to-reach populations defy broader national policies. As a result, Vietnam continues to face significant problems with chronic malnutrition among women and children, particularly in rural areas and among ethnic minority groups of the Northern Mountainous Region (NMR) (Mbuya et al., 2019; McBride et al., 2018), posing a challenge to those engaged in improving the country's public health status. The ethnic minority groups (e.g. H'mong, Tày, and Dao peoples) predominant in the NMR live in remote areas and depend mostly on subsistence farming (Bonnin & Turner, 2012; Son & Kingsbury, 2020). The lowlands of the NMR are mainly populated by Kinh, the dominant majority group in Vietnam, while Tày dwell in mountain valleys, and Dao and H'mong live at middle and higher altitudes, respectively. Dao, Tày and H'mong people grow paddy rice on terraced hills, grow maize, rear livestock, maintain home gardens, conduct small-scale barter and trade, and cultivate fruit-tree plantations in mountain forests (Bonnin & Turner, 2012; Son & Kingsbury, 2020; Trincski, 2017). Although the de-collectivization of agriculture in Vietnam through successive land reforms has enabled crop diversification and production for individual profits, farming households face high rates of poverty and food insecurity (Bonnin & Turner, 2012; Scott, 2003). Agriculture in the NMR is particularly vulnerable

to drought, flooding, soil erosion, and landslides. Furthermore, agricultural extension services are limited, and markets to buy inputs and sell produce are hard to reach, particularly at higher altitudes (Pham et al., 2019; Son & Kingsbury, 2019). Challenges like these put farming households at risk of food and income shortages. To cope with such shortages, the quantity of food eaten is often reduced, and nutrient-dense foods such as animal-source foods rich in iron, zinc, and protein are substituted with cheaper foods rendering malnutrition, particularly in children, inevitable (Son & Kingsbury, 2019). Stunting and undernutrition rates are three times higher among children in mountainous areas compared to lowland areas (McBride et al., 2018). The NMR provinces of Lào Cai, Lai Châu, and Hà Giang bordering China present some of the highest levels of chronic child malnutrition in the country, requiring greater effort and more focused attention (see Table 1).

Inadequate breastfeeding and poor complementary feeding practices¹ are major factors contributing to poor development among Vietnamese children (P. H. Nguyen et al., 2011; Phu et al., 2010). Changes to local and regional food systems and supply have increased the availability and consumption of highly processed and refined foods that are energy-dense but nutrient-poor, which, when consumed by infants, hamper proper development and increase the risk of stunting (Binns et al., 2020). Common complementary solid foods in Vietnam include rice porridge, gruel, noodles, vegetable pastes, flour-based traditional foods, and commercially prepared packaged cereals, only some

of which are fortified with minerals and vitamins (Binns et al., 2020). Strategies to encourage exclusive breastfeeding for the first six months of life and promoting high-quality complementary foods and feeding practices after that are essential to prevent stunting and wasting in order to guarantee healthy growth and development in infants and young children (Binns et al., 2020; Graziose et al., 2018).

Fortifying food with micronutrients has been identified as an intervention option (along with supplementation and increased dietary diversity) to tackle malnutrition, particularly in situations requiring rapid results (Binns et al. 2020; Timotijevic et al., 2013). In regions where rice is a dietary staple, rice-based fortified cereal is a cost-effective option to reduce micronutrient deficiencies and anemia by providing additional dietary iron (Awasthi et al., 2020; Fiorentino et al., 2018). An efficacy study by Awasthi et al. (2020) found that rice-based cereal fortified with a low to moderate dose of iron was safe for infant consumption. Children who consumed the fortified cereal also had better blood-iron status and development in language, motor skills, and socio-emotional and adaptive behaviors when compared to children who did not consume it. However, despite evidence of potential efficacy (Awasthi et al., 2020; Campos Ponce et al., 2019; Okeyo, 2018; Phu et al., 2010), there are challenges surrounding food-fortification strategies to address child malnutrition. One challenge is the technical feasibility of developing food products that are not only safe and meet the nutritional needs of the target population, but are also socially accepted by the

Table 1. Nutrition Profile of Provinces in the Northern Mountainous Region of Vietnam, 2013

Issue	Lào Cai	Lai Châu	Hà Giang
Prevalence of women aged 15–49 years with chronic energy deficiency	13.7%	11.9%	12%
Prevalence of stunting (low height for age), children under 5 years	37.3%	36.8%	35.4%
Prevalence of underweight (low weight for age), children under 5 years	22.1%	23.9%	23.5%
Prevalence of wasting (low weight for height), children under 5 years	4.9%	4.9%	9.8%
Proportion of children 6–23 months with minimum acceptable diet	42.5%	47.8%	59.8%

Source: NIN et al., 2014.

¹ Complementary feeding is the process when infants and young children eat foods and liquids along with breast milk to meet their nutrient and growth needs.

intended consumers. Often the fortification of staple foods is a joint effort between public, private, and civil society, where local farmers and food processors are involved in the production and processing in compliance with government regulations, nutritional standards, and appropriate marketing guidelines (Lalani et al., 2021; Van Liere et al., 2017). However, to produce high-quality fortified foods, local small and medium-sized businesses need support from credible technical agencies to address challenges related to sourcing raw materials that meet safety standards, defining product composition, operating at scale, and ensuring quality and control (Van Liere et al., 2017).

Proposed fortification strategies must also consider the contexts of child-feeding practices and be appropriately tailored for the proper utilization and consumption of the products (Champion & Seidel, 2015; Gillespie et al., 2019). This includes, importantly, the concern of not having fortified complementary food (FCF) undermine breastfeeding. The appropriate production, distribution, acceptability, price, and ability of FCF to reach the target population must also be considered (Leyvraz et al., 2017; M. Nguyen et al., 2016; Van Liere et al., 2017).

As food systems connect directly to the processes of poverty reduction, strategies for improving nutrition, and enhancing agricultural sustainability, decision-makers, researchers, and public-health implementers can adopt a food-system approach to make sense of transitions in diets, use resources sustainably, and support social inclusion in low- and middle-income countries (LMICs) (Brouwer et al., 2020), such as Vietnam. A food-system approach assesses links between food activities, markets, and institutional networks, as well as nutrition, socio-economic, and environment outcomes (Brouwer et al., 2020).

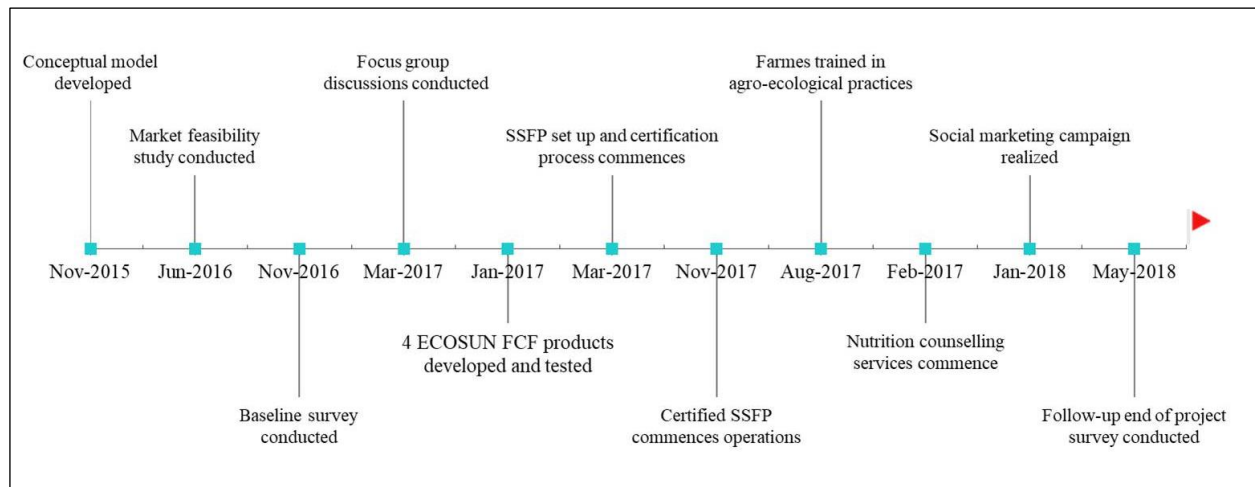
The National Institute of Nutrition (NIN), a department of Vietnam's Ministry of Health, is responsible for facing the challenge of continuously improving the country's nutritional status. NIN leads national nutrition surveillance and research, designing public health programs and nutrition interventions that focus on the first thousand days of

life, as well as informing national policy on these topics. NIN's Centre for Scientific and Technological Service in Nutrition and Food (NINFOOD) is its research and development arm that specializes in applying food-safety and food-science technology to produce food products that enhance and improve the nutritional status of vulnerable groups (M. Nguyen et al., 2016). When NINFOOD piloted local production, distribution, and sale of micronutrient powder (branded as Bibomix) using the public-health system, they found successful uptake by increasing the capacity of health workers to counsel on child-feeding practices and fortifying complementary food at home (M. Nguyen et al., 2016).

A partnership between NIN and the Centre for Studies in Food Security (CSFS) at Ryerson University² in Canada led to the development and implementation of the ECOSUN project "Healthy Farm, Healthy Food, Healthy Kids" that ran from November 2015 through June 2018. With the ultimate goal of reducing levels of food insecurity and chronic child malnutrition in Lào Cai, Lai Châu, and Hà Giang provinces, the objective of the ECOSUN project was to increase local availability and utilization of fortified complementary foods for children aged 6 months to 5 years by establishing a local, small-scale processing facility. The core strategy in the ECOSUN project used a food-system approach that focused on developing FCF from locally produced crops for distribution in targeted areas of the three provinces, accompanied by nutrition-education counseling to promote optimal complementary feeding practices (see Figure 1 for project timelines and milestones). The ECOSUN project team and authors of this paper were made up of program implementers and researchers from NIN, NINFOOD, and academic subject experts from the Centre for Studies in Food Security (CSFS) at Ryerson University. The CSFS engages academic, government, and civil society in dialogue and research to take an interdisciplinary and systems approach to addressing the health, social justice, environmental, sustainability, and socio-cultural aspects of food security. Through the partnership with NIN, the CSFS supported the

² As of April 2022, Ryerson University was renamed Toronto Metropolitan University.

Figure 1. ECOSUN Project Timeline



ECOSUN project with conceptual design, research dissemination, capacity building in food security, and knowledge exchange.

This paper describes the process undertaken by the project team to design and implement the ECOSUN project to address food insecurity and chronic child malnutrition in northern Vietnam while looking to overcome the many challenges surrounding a food-fortification strategy. The conceptual model followed in the project, research undertaken to assess its effectiveness, and project activities are explained in the next section. Many of the research components and findings are already published or in production; however, they are referenced in this article as they offer insights on successes and challenges and make up a cohesive part of the project.

Methods

The Conceptual Model

While a food-based approach to increasing dietary diversity without the need for supplements or fortified foods would be ideal to combat chronic child malnutrition, the research literature shows the reality that diets based on local foods alone often fail to ensure the desired results (Ferguson et al., 2019; Morris, 2018). Reasons for this include local food preferences for nutrient-poor foods, customary diets, and the low availability of high-quality animal-based foods. Quite commonly, a major reason for

child malnutrition among low-income populations is the inability to access nutrient-dense foods for a diverse diet that are often available through markets but at prices unaffordable to the target population. That is, a major reason for child malnutrition is poverty leading to food insecurity.

Thus, the challenge to overcome high levels of child malnutrition passes through both the inadequate local availability (the supply side) of nutrient-rich foods, to the inadequate access to and consumption (the demand side) of appropriate diets. It is a challenge involving the whole food system. Addressing one part of this system is often not enough. For example, developing a quality fortified product to address micronutrient deficiencies will not be enough if that product cannot reach the target population (due to problems with distribution) or if it is not accepted by consumers (due to particular preferences). Even when accepted by consumers and available in local markets, low-income populations may have difficulty including the product in their regular diets.

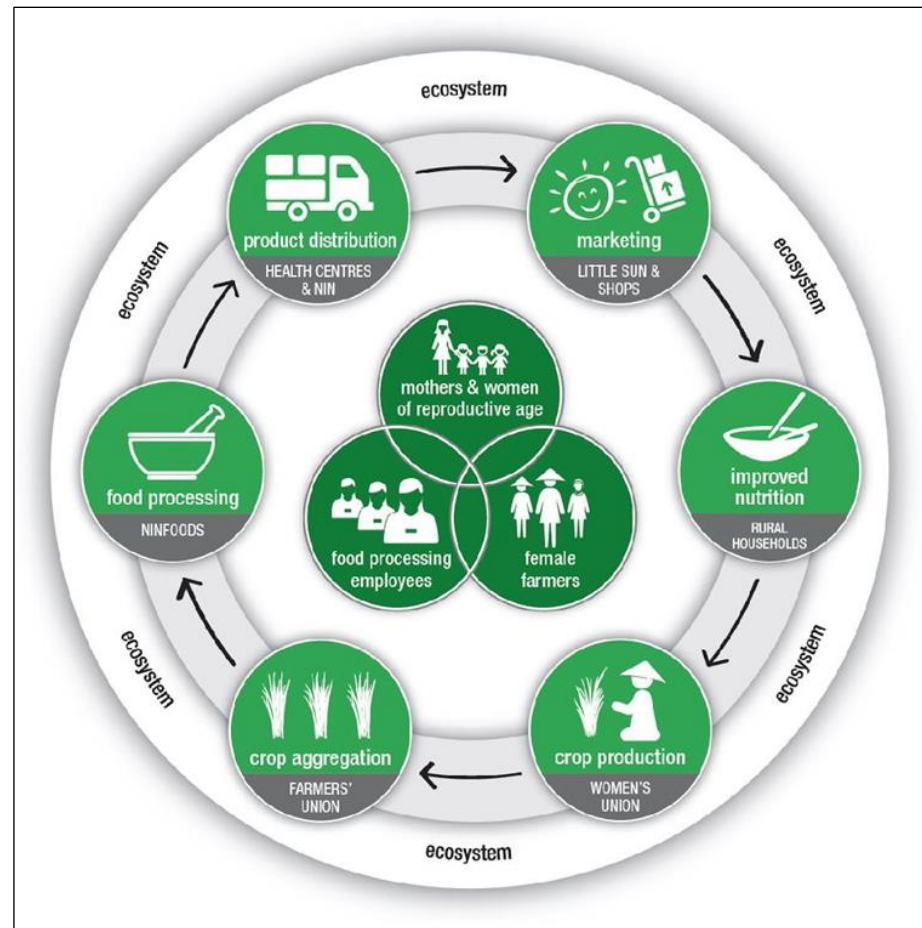
With these challenges in mind, the ECOSUN team developed a conceptual model of a food-system approach (Figure 2) to guide implementation of the project. The main elements of the conceptual model include (1) attention to the local food system embedded into a particular socio-ecological system, and (2) the positioning of women at the center of the project activities. It was important to combine local solutions that address the socio-eco-

conomic context of nutritional problems along with an understanding of the need to develop the local economy as a long-term, sustainable way to address food security and child malnutrition. The project team focused on developing interventions that would contribute to the broader goal of transforming the local economy and reducing poverty rates. Recognizing the dominance of small-scale family farms in the region's agricultural production, the team proposed using local crops as the basis for developing fortified food products. It further proposed processing the products in local facilities, with local workers, and distributing it with support from local health units and local commercial

shops. That is, the fortified complementary foods to be introduced to help fight child malnutrition would not be imported or produced in large urban centers, but rather be part of the local economy and support local food security.

There were many reasons for positioning women at the center of the project. The nutritional status of a child is closely linked to the mother's own physical and mental health (Ruel & Alderman, 2013). Furthermore, children's health has been positively linked to mothers' education and nutritional knowledge (van den Bold et al., 2013), as well as women's empowerment (Cunningham et al., 2015). Moreover, as a large proportion of subsistence farmers in the region are women, the design of the project focused on women and recog-

Figure 2. ECOSUN's Conceptual Model



nized their many roles as primary caregivers of children, as local food producers, and even their dominance as health providers in the local health sector.

Representing the local food system as a circular flow within a given socio-ecological system, ECOSUN's conceptual model highlights the importance of local crop production and aggregation (facilitated and supported by local Women's unions³ and/or farmers' unions) to supply basic raw material for local food processing. NINFOOD would oversee the processing and then distribute the products through local health centers and commercial shops. Together with NIN, these outlets would promote the new products, which would be incorporated into children's diets. This circular flow is completed with improved nutrition

³ Women's unions in Vietnam are socio-political groups established at the national, provincial, and local levels to promote women's affairs, give women voice, develop their economic empowerment, and promote the development of women's groups.

enhancing the health and productivity of local workers.

Site Selections

Nine communes in Lào Cai, Lai Châu, and Hà Giang provinces were chosen as project implementation sites. In each province, three communes located within one district were identified. Accordingly, the communes of Trinh Truong, Ban Vuoc, and Quang Kim were selected from Bat Xat District of Lào Cai. The communes of Sin, Ban Giang, and Ban Hon were selected from Tam Duong District in Lai Châu. And the communes of Dao Duc, Trung Thanh, and Viet Lam were chosen from Vi Xuyen District in Hà Giang province. The districts and communes were selected based on having similar characteristics for population density, area, number of women of reproductive age (15 to 35 years), percentage of children less than 2 years of age, socio-economic status, proportion of agricultural producers, and climate patterns (Brown et al., 2019a). Agriculture is the primary source of income for 70.7% of women in these communes. The population profile consists of multiple ethnic minorities such as Giáy, Tày, Dao, H'mong, Nhung, Tha, Lu, and other small groups (Brown et al., 2019a).

Research Methods

As a research-for-development project, activities with measurable outputs and outcomes were carried out as well as research-based components using mixed methods. NIN staff implemented the project and conducted research with direct support from one Ryerson University staff member who is fluent in Vietnamese and based in Vietnam. While research processes are often linear and controlled, project implementation is an iterative process subject to innumerable external variables. The ECOSUN conceptual model helped visualize the points of entry for various research components, thus resolving tension and creating cohesion between research processes and project implementation. Between 2016 and 2018, the team monitored project implementation by record-keeping during activities, annual review meetings, and site visits. Mixed-methods research was employed to either inform or evaluate changes in prevalence of child malnutrition and food security before and after

project activities. Quantitative studies by means of baseline and follow-up surveys, as well as an acceptability trial conducted alongside qualitative methods (using focus group discussions and key informant interviews) helped illuminate local complementary feeding practices, the role of women inside and outside their homes, crop profiles, and market feasibility. The research studies, their methodology, analyses, and findings are documented in separate reports and publications (Brown et al., 2019a, 2019b; A. T. Nguyen et al., 2018; Do Huy et al., 2018).

As part of the project's monitoring and evaluation processes, 24 policymakers and 22 agricultural extension staff (from provincial people's committees, departments of health, reproductive health centers, district health centers, commune health centers, education department, agriculture departments, and agriculture promotion centers) engaged with and contributed to review meetings, key informant interviews, and focus groups.

The project and its protocol for research components were reviewed and ethics approval was attained first through the research ethics board of the National Institute of Nutrition of Vietnam (August 4, 2016) and subsequently through the research ethics review board of Ryerson University in Canada (REB 2016-314). Participants provided voluntary and informed consent in writing prior to participating in the research components. Where children were involved, primary caregivers gave voluntary, written, and informed consent.

Baseline and follow-up surveys were conducted within approximately one and a half years of each other at project sites in order to evaluate changes in the prevalence of malnutrition and food security in Lào Cai, Lai Châu, and Hà Giang and test for factors related to the food systems approach (Brown et al., 2019a; Do Huy et al., 2018). Child-caregivers living in the project communes were randomly sampled during baseline ($N=799$ pairs) and follow-up ($N=995$ pairs) and assessed on measures of food security, child nutrition, hygiene, crop production, and women's roles. Sample sizes were determined using a confidence level of 95%. Children who fell within the ages of 0 to 24 months were included. Blood samples of children 6-11 months old were also collected. The follow-

up study also included a follow-up cohort of 147 children from the baseline assessment (Do Huy et al., 2018). The surveys used the Household Food Insecurity Access Scale to measure changes in the prevalence of household food security status of the caregiver-child pairs over time (Coates et al., 2007). Nutrition-related factors were assessed using core indicators for knowledge, attitudes, and practices in complementary child feeding,⁴ child anthropometrics, and hemoglobin measures (World Health Organization [WHO], 2010). The baseline and follow-up surveys also assessed the role of women as related to local agriculture and food security using questions from the Abbreviated Women's Empowerment in Agriculture Index (Malapit et al., 2020). Logistical regression analysis was performed on the baseline data to explore factors associated with the nutrition status of children (Brown et al., 2019a).

Following the baseline survey, qualitative research helped round out the picture on local knowledge, attitudes, and practices related to child feeding; challenges women farmers faced integrating into the local food supply chain; and the role of women in decision-making within and outside the household, particularly as it relates to child feeding practices and crop production. Two focus-group discussions were held in each of the three provinces with a total of 63 smallholder farmers (41 of whom were women). In each province, three agro-ecological extension workers also took part in the focus groups. Key informant interviews were conducted with local agricultural extension workers, health service administrators, and an employee from the local Women's Union.

Project Activities

This section describes how the different parts of the conceptual model of the food system manifested in the project activities.

Product development: The ECOSUN fortified food products

Micronutrient fortification of foods is not new to some locations in Vietnam (Laillou et al., 2012; Phu et al., 2010). In the past two decades,

NINFOOD has collaborated with international partners to develop, test, and evaluate several fortified products with proven efficacy to meet the needs of different malnourished populations (Food and Nutrition Technical Assistance III Project [FANTA], 2014; M. Nguyen et al., 2016).

NINFOOD's laboratories and processing plant in Hanoi have established a quality control, Hazard Analysis Critical Control Points system (HACCP), following international standard protocols to ensure food safety while processing, as well as the quality of raw materials and the correct composition, seal integrity, packaging, and labeling of products (Schauer et al., 2017). NINFOOD is certified under both Codex Alimentarius and ISO 22000:2005 global standards.

Under the ECOSUN project, the challenge for NINFOOD was to develop products to meet three requirements. First, products had to present a nutrient composition that addressed the main nutritional needs of infants and young children in Lào Cai, Lai Châu, and Hà Giang. The anthropometric indicators and hemoglobin blood tests for children from the baseline study established that the population of the northern provinces, particularly young children, had a high risk for iron and zinc deficiencies (Laillou et al., 2012; A. T. Nguyen et al., 2018). Second, local crops should be used as the basis to produce the fortified foods. Third, the new products had to be accepted and used by local consumers.

Guided by these criteria and the Global Alliance for Improved Nutrition (GAIN) macro/micronutrient recommendations for FCF formulations (GAIN, 2010), NINFOOD developed three lines of products under the ECOSUN label:

1. *Chao Ngon fortified instant porridge (fortified with iron and zinc)*

This fortified extruded rice cereal is meant to serve as the basis for meals, which would also include home-grown vegetables and a protein. This cereal is ready 3 minutes after adding boiling water, reducing the caregiver drudgery associated with making porridge.

⁴ Core indicators on knowledge, attitudes, and practices in complementary feeding include acceptable diet, minimum meal frequency, minimum dietary diversity, and time when complementary feeding was started (UNICEF & WHO, 2010).

A 30-gram serving of Chao Ngon has been fortified with 0.9 mg of iron and 0.45 mg of zinc. Each serving provides 118 Kcal of energy and 2.7 g of protein.

2. *VICA freeze-dried vegetable powders (fortified with a premix of calcium, vitamin D3, magnesium and zinc)*

Four local vegetables (mushroom, sweet leaf [*Sauropus androgynous*], pumpkin, and carrot) were chosen for processing, prior to the addition of the micronutrient premix formulation, based on the taste preferences and local crops women farmers produced. VICA vegetable powders can be added to the Chao Ngon instant porridge and other foods for fortification. Researchers at NIN determined the composition of the products by considering the required dietary allowance (RDA) for children of complementary feeding age. A 3-gram serving sachet packet provides 12% of the RDA levels of calcium, vitamin D, magnesium, and zinc.

3. *VICA lipid protein packets (made from milk protein and soybean oil)*

These are to be used in cases where there is low availability or affordability of natural protein sources. The packet contained vegetable oil, whey, soy protein, powdered egg whites, yeast extract, E 635 flavoring, salt, lecithin, chicken flavor, powdered pepper, garlic, onion, and vitamin E. Each 10-gram packet provides 54 Kcal of energy, 4.1 g of protein, and 4 g of lipids.

NINFOOD tested acceptability of the ECOSUN products among the local target population using the Saleable Acceptability Trial Model and Just-About-Right rating scale (Brown et al., 2019b). Primary caregivers of students at a kindergarten in Bat Xat district in Lào Cai province tried the Chao Ngon porridge and VICA vegetable powder with their children (N=126 pairs), the majority of whom were between the ages of 9 and 60

months. All the products received high points on overall acceptability, smell, taste, texture, and after-taste. Testers also showed high satisfaction for consistency, fat content, and saltiness for each FCF. Satisfaction ranged from 81% to 92% (Brown et al., 2019b).

The frequency and time of use was also determined during the acceptability test. About 55% of participants said they use instant porridge several times per month, and 21% said they use it for their children several times per week. Frequently eaten instant porridge brands, few of which are fortified, were also identified to determine competitors in this local market (Brown et al., 2019b). Furthermore 58% of participants said that 3000 to 5000 VND (US\$0.13 to US\$0.22 cents) is an acceptable price for the product, and about 19% said that 2500 to 3000 VND (US\$0.11 to US\$0.13) is an acceptable price (Brown et al., 2019b).

Food processing: Public-private partnership

A key element of the project was the setting up of a local small-scale food processing (SSFP) facility in Lào Cai to produce two of the ECOSUN products: the Chao Ngon fortified instant rice porridge and the VICA vegetable powders.⁵ The northern region of Vietnam is known for rice and vegetable production, most of which is grown by smallholder family farmers. NINFOOD's previous research on efficient and effective food processing methods of producing instant flours and other foods through small-scale extrusion cooking served as the basis for establishing the local SSFP facility in Lào Cai (Phu et al., 2010). Extrusion cooking followed by milling is a versatile and low-cost food processing technique that allows for consistent product quality. The process can ensure uniformity of the final product and can increase the shelf-life and transportability of food.

There were several innovative features in this component of the project. Prominent among those was the establishment of a public-private partnership (PPP) between NINFOOD and a local food business enterprise, the Thuy Dung Company, led by a local businesswoman. Long-term contracts be-

⁵ The VICA protein/lipid sachets packets continued to be produced in the central NINFOOD facility in Hanoi. These require higher hygiene standards due to a high risk of product contamination.

tween a private party and a government entity characterize PPPs. Viable PPPs have been identified as key factors in the successful implementation of large-scale food-fortification programs in many countries of the global north (Timotijevic et al., 2013), but their record in developing countries presents mixed results (Champion & Seidel, 2015; Hoddinott et al., 2015).

From the perspective of NIN and NINFOOD, the primary attraction of a PPP was the sustainability of local production and distribution of ECOSUN products beyond the life of the project. Given the conceptual model, it would not make sense to have the products processed centrally in Hanoi. The alternative, creating a subsidiary NINFOOD plant in Lào Cai, would require too many resources, beyond what NIN had available from both the Ministry of Health and international funders. Furthermore, the PPP could be seen as part of the private-sector development strategy included in the government's economic plan (Asian Development Bank [ADB], 2012; Schaumburg-Müller, 2005). For the Thuy Dung Company, the advantage was the potential for profits from being the only supplier of ECOSUN products in the region. The possibility of market expansion beyond the three provinces was an added attraction.

NINFOOD and the Thuy Dung Company signed a formal 10-year contract to cost-share the establishment of the SSFP plant, which included renovating the firm's 3,200 square-foot facility, as well as operating costs. Ultimately responsible for the quality and safety of the final packaged products, NINFOOD developed the licensing agreement and established food production protocols. Eight hired plant workers completed training on Hazard Analysis Critical Control Points (HACCP) procedures and food safety standards. NINFOOD also designed the factory space to be ISO 22000-compliant and commissioned customized extrusion and freeze-drying equipment.

The ECOSUN SSFP facility in Lào Cai province was officially opened in November 2017 after receiving the certification from the Ministry of Health. It has a daily production capacity of 300 kg of fortified instant rice porridge and 10,000–12,000 VICA packets by processing 60 kg of vegetables per hour.

Crop production and aggregation

As part of its 10-year contract with NINFOOD, the Thuy Dung Company committed to purchasing vegetable crops from a local agricultural cooperative, the Song Kim Collective. This arrangement introduced a strategy of indirect public food procurement to favor local small family farmers.

In recent years, public food procurement from smallholder farmers has been pursued as a policy strategy to strengthen rural livelihoods and promote rural development (Miranda, 2018). The idea is to expand market opportunities for smallholder producers, and also reduce the uncertainties and risks associated with market participation. When successful, it is hoped that the additional income generated through public procurement schemes will increase household food consumption and dietary diversity, and even generate some spillover effects in local economies.

Key to the success of such strategies is for the smallholder production to be compatible with the food baskets or menus in demand from public procurement. Under the ECOSUN project, that condition was met by design, with products developed according to crops already being produced in the region.

However, a major hurdle in successful public food procurement strategies is often the inadequate capacity of smallholder farmers to meet the demand with high-quality products in sufficient quantities. In the case of the ECOSUN project, vegetables to be used in the formulation of the FCF products have to be produced under strict good agricultural practices and be supplied in reliable quantities for smooth operation of the SSFP plant. The question is, can smallholder farmers meet the supply and quality demands created by public food procurement?

The literature suggests crop aggregation through farmer cooperatives assists in guaranteeing a more reliable supply (Miranda, 2018). The Song Kim Collective, comprising 17 local smallholder farming families, is an agricultural cooperative recently formed with the intention of meeting that demand challenge. Moreover, in terms of guaranteeing the quality of products needed, 450 women farmers in the nine project communes of the three provinces completed

training on good agricultural practices through the ECOSUN project.

Food distribution, marketing, and counseling

Each woman farmer trained on good agricultural practices received samples of ECOSUN products, including key nutrition messages. This was part of the social marketing strategy to promote greater acceptance of the new products in the region. In this case, having the products in their hands and learning about their importance for children's health also instilled a sense of pride among the women farmers, showing their value as a key link between the production of quality crops and the quality of the food to be given to their own and other families.

Consumer taste testing during the acceptability trial suggested the potential for easy acceptance of the ECOSUN products by the local population (Brown et al., 2019b). However, as it is necessary to contextualize FCF products for the local food environment and ensure their appropriate use with children (Gillespie et al., 2019), care was taken to appropriately tailor the distribution, marketing, and counseling of mothers about the new products, considering the local context of infant and young child feeding practices in the region. Labeling and marketing were developed to comply with the International Code of Marketing of Breast-Milk Substitutes (WHO, 1981), and three main strategies for the promotion and initial distribution of the products were established.

Little SUN Nutrition Education Counseling Centers. Logistical regression analysis performed on the baseline data to identify significant predictor variables for malnutrition indicated that engagement by caregivers in nutrition education counseling in the three months prior correlated with decreased stunting rates in children under the age of 2 (Brown et al., 2019a). As part of a previous project with the Scaling-Up-Nutrition (SUN) movement and Alive & Thrive, an international nongovernmental organization dedicated to improving the nutrition of infants and young children, NIN had been establishing a series of nutrition education counseling centers (Little Sun Nutrition Education Counseling Centers) located at provincial, district,

and communal health centers throughout the country to promote exclusive breastfeeding and improve complementary feeding practices (Rawat et al., 2017). Once the baseline survey was completed, 15 new nutrition education counseling centers were established throughout the three northern provinces as key partners in the distribution of the ECOSUN products. The modus operandi of these counseling centers is to support individualized services with mass media campaigns aimed at creating greater demand for their services and promoting better feeding practices. Thirty-six health workers at the 15 Little Sun centers were trained on infant and young child feeding practices and preparing the ECOSUN products (Chao Ngon instant porridge and VICA vegetable powder) using regular local foods to teach mothers during counseling sessions. One-to-one as well as group nutrition education counseling sessions were held with pregnant or nursing women and mothers with children under the age of two.

Preschools as institutional buyers. As part of the distribution strategy, NIN targeted local kindergartens and preschools in project areas with a high prevalence of malnourished children. Normally, preschools in poor areas run snack programs partially subsidized with government funds. With support from the private partner Thuy Dung Company, NIN negotiated with the local education departments to use the government subsidies toward purchasing ECOSUN Chao Ngon instant porridge in bulk for distribution to 21 preschools in Lào Cai, Lai Châu, and Hà Giang.

Mixed marketing methods. Local wet markets, shops, pharmacies, and potential consumers in Bát Xát District in Lào Cai took part in a market feasibility survey to assess the potential market for complementary foods and to assess the crop-production patterns of women farmers (NIN, 2016). The findings from the feasibility study concluded the sites were appropriate based on the local retailers' base and women farmers looking for stable markets for their produce. The study demonstrated significant buy-in from local government (NIN, 2016). Despite the potential of institutional buyers, much of the sustainability of

the ECOSUN project depends on the success of its products in the regular marketplace. In launching the products, NINFOOD engaged in numerous promotion activities in the three northern provinces. An ECOSUN brand identity developed with the tag line “Healthy Farm, Healthy Food, Healthy Kids” captured the project’s underlying food-system approach. Promotion and marketing activities included community events, billboards, showcase booths, and promotional items such as insulated travel cups to prepare the fortified foods.

Results

After 32 months of setting up the model and putting it in motion, a viable value chain for fortified foods was fully functional and showing many signs of positive influence (see Appendix).

The local food processing plant was operationalized to serve as a stable purchaser, creating a value chain for local crops and contributing to successful partnership models, i.e., through private-public sector collaborations. This included a 10-year public-private partnership between NIN and Thuy Dung Company entailing a procurement contract with the Song Kim Collective of local small-holder farmers.

Between November 2017 and May 2018, the operational SSFP produced 4,795 kg of Chao Ngon instant fortified food product that were supplied to marketing promotion activities, local vendors, and kindergartens. VICA production commenced in April 2018 and the factory yielded 30,000 sachet packs over two months. One Chao Ngon serving packets costs 2500 VND (US\$0.11) and one VICA powder packets costs approximately 3,600 VND (US\$0.16), depending on the flavor. During marketing events alone, 2,913 consumers purchased 28,133 packets of Chao Ngon and 2,741 sachets of VICA.

Local public institutions successfully promoted demand for the products and knowledge regarding the value of FCF. Thirty-six health workers at the 15 Little Sun centers across the three provinces reached 14,438 children under the age of 2 by providing 10,561 family nutrition-education counseling sessions during the project. Table 2 summa-

rizes the counseling services provided.⁶ School meal programs in 21 preschools in Lao Cai served the Chao Ngon instant fortified rice porridge to 2,552 children (aged up to 60 months).

The individual and family nutrition-education counseling sessions, training workshops for farmers, and marketing events reached approximately 20,000 rural women who were using the ECOSUN fortified complementary foods for their children.

The findings from comparing the baseline and follow-up data revealed the following changes in the prevalence of chronic child malnutrition, food security, and complementary child feeding after applying the ECOSUN conceptual model in the project communes.

Prevalence of chronic child malnutrition. The initial analysis of the follow-up data found a decline in malnutrition rates when compared to the baseline survey. The prevalence of underweight in sampled children at the project sites dropped from 17.2 % to 13.9 % (i.e., a 3.3 % reduction) and wasting decreased from 7.9 % to 3.4 % (Do Huy et al., 2018). It should be noted that a time frame longer than the project duration of two years would be needed to measure improvements in stunting in children. Typically, the prevalence of moderate stunting among the follow-up sample of children was found to be 20.8 % while 8.1 % of children were severely stunted. When broken down by province the stunting rates in each province were similar, hovering around 28% (Do Huy et al., 2018).

Food security. The Household Food Insecurity Access Scale used to assess the prevalence of perceived household food insecurity and to detect changes in their situation over time with respect to the dimension of access (Coates, Swindale, & Bilinsky, 2007) found fewer households reported feelings of uncertainty and anxiety over food at follow-up. The prevalence of worrying about not having enough of food among respondent households was 38.2 % at baseline but reduced to 22.5% at follow-up (Do Huy et al., 2018).

The prevalence in the perception among

⁶ Two Little Sun centers were closed due to building renovations.

households that food is of insufficient quality, which includes dietary diversity, nutritional adequacy, and preferences, also showed improvements at follow-up. The number of people reporting that their household *must eat a limited variety of foods due to lack of resources* was 36.6 % at baseline but reduced to 20.2 % at follow-up. The prevalence of *limiting dietary preferences due to lack of resources* was cut in approximately half from 42% at baseline to 20.4% at follow-up. A similar result was seen in the prevalence of households that reported *having to eat foods that they did not want to eat due to a lack of resources to obtain other types of food*. The prevalence of this measure was 34.3% at baseline but declined to 17.1% at follow-up (Do Huy et al., 2018).

Food insecurity due to perceived insufficient quantity of food within households was less prevalent than perceptions of insufficient food quality among the population both at baseline and follow-up (Do Huy et al., 2018). The changes in the prevalence of these perceptions between baseline and follow-up were also much smaller. At baseline approximately 15% of the population reported *food shortages in the previous year and had to eat a smaller meal than needed because there was not enough food*. The follow-up study found that both these measures declined by only 4% (Do Huy et al., 2018). At baseline, 7.4% of the households reported *having to eat fewer meals in a day due to insufficient food at home*. The prevalence reduced by only 1.1% at follow-up. In addition, 7.4 % of households also reported *times when there was no food to eat due to lack of resources to get food* at baseline. The prevalence of this measure reduced slightly at follow-up to 5.3% of households. Lastly, while only 1.3 % of households reported *going to sleep at night hungry because there wasn't enough food* at baseline, the prevalence of this measure in the population doubled at follow-up to 2.6%.

Improved complementary feeding practices.

With regard to complementary feeding indicators among the sampled child-caregiver pairs, between baseline and follow-up only slight increases were seen in the prevalence of consumption from four or more food groups during mealtime, *minimum meal diversity*, from 44.4% to 47.9%, as well as in the prevalence of the minimum recommended

number of times complementary foods were eaten, *minimum meal frequency*, from 73.3% to 78.8% (Do Huy et al., 2018). It is noteworthy that while three-fourths of the sampled population can feed their children at least the minimum recommended number of times, less than half of them are able to give foods from four or more food groups during complementary feeding. The *minimum acceptable diet indicator* (which is a composite indicator of *minimum meal diversity* and *meal frequency*) increased only by about 1% between baseline and follow-up, from 43.1% to 42.3% (Do Huy et al., 2018).

However, complementary feeding timing, which is the timely introduction of complementary foods at 6 months, is highly prevalent. At baseline it was practiced by just over 80% of the sampled population, and the prevalence increased to 100% by follow-up (Do Huy et al., 2018). The prevalence of consuming iron-rich complementary food increased more than 10%, from 57.9% to 72.9%. This is a promising finding given the key role of iron in child growth and development, and prevention of anemia (Do Huy et al., 2018).

Discussion

In their assessment of 32 highly cited international studies on food systems, Brouwer, McDermott, and Ruben (2020) noted that the majority of literature examined linear and generic views of supply-demand networks that focus on supporting food production, agri-food supply chains, and markets and the institutional food environment. They found that only a small portion of the literature focused on the relationship between nutrition and health results, the role of consumer choice motives (social, economic, biological, and psychological) as potential food system drivers, or related implications for nutrition and health that arise from recent changes in eating habits, such as the increased consumption of ultraprocessed foods.

The learnings from the ECOSUN project contribute to filling the above-mentioned gap in the literature. The project focused on a circular food-system approach to sustainably increase local fortified complementary foods and decrease childhood malnutrition. An integrated and systemic approach was expected to not only improve the local availability of high-quality fortified comple-

mentary foods among malnourished and food-insecure children, but also incorporate sustainable livelihoods that involve the local community, local producers, local businesses, local health services, and other local partners (local governments, preschools, etc.).

NINFOOD successfully developed three products under the project, two of which used local crops and were processed in the local small-scale food processing facility in Lào Cai. The private-public partnership established with a local businesswoman was crucial for the longer-term viability of these initiatives. NIN also successfully collaborated with provincial and local government departments in the three provinces to provide nutrition-counseling sessions through the Little Sun centers, supply ECOSUN instant porridge to preschools (serving over 2,500 children), promote marketing activities in communes, and train women farmers in good agricultural practices. Materials on child feeding for minority groups were also adapted to serve the specific needs of ethnic minorities in the areas of project implementation. Acting as a policy-influencer at the national level, NIN used the lessons from the ECOSUN project to directly support Vietnam's National Plan of Action for Nutrition (NPAN)⁷ 2018–2020, which calls for improvements in legislation to ensure food security for poor and disaster-affected areas (Ministry of Health [Vietnam], 2018).

Despite significant accomplishments, the project faced many challenges during its three-year (2015–18) implementation. Partnering with the private sector, bidding for tenders, and equipping and operationalizing small-scale food processing plants through private tenders were completely new areas for NIN staff. The bidding procedure and laws in Vietnam presented an administrative challenge as they translated into complicated and time-consuming processes. Despite presenting a steep learning curve for the project team members and delaying operationalization of the SSFP facility, NIN staff is now familiar with and has the know-how to partake in future bidding for tenders to partner with the private sector.

Establishing competitive market prices for the

ECOSUN products was another challenge. Given its proximity to China, the region has a frequent influx of cheap, easy-to-prepare, and tasty instant foods that are poor in nutritional value. The initial prices for the FCF products, while still slightly higher than nutrient-poor competitors, were considered appropriate given their perceived better quality.

Lào Cai, Lai Châu, and Hà Giang are located in the Northern Mountainous Region, where the target communities have limited road access. This made finding distributors for the ECOSUN products difficult in the short time frame of the project. However, as the project revolved around testing a food-system model while partnering with the private sector, it was a “learn-as-you-go” process. Furthermore, through the 10-year agreement signed between Thuy Dung Company and NINFOOD, the partners will continue to build and refine the marketing strategy to increase product demand. So far, NIN has leveraged Little SUN nutrition centers to promote the products, while NINFOOD identified nearby local vendors to sell them. Plans for further distribution of the products include hospitals as well as preschools and Little SUN centers in other provinces. The partners also plan to sell in urban areas, where distribution will be easier and the products can be sold at a premium. This price discrimination strategy will help offset costs in rural areas, which could be higher due to higher transportation expenses. NIN and NINFOOD have learned that flexibility is critical in promoting the product and creating demand, noting that what works in one commune may not work in another.

The comprehensive nature of the food-system approach necessitated collaborating with a variety of sectors. However, the lack of partnerships with multiple national-level actors in addition to NIN was a limitation of the project. Nevertheless, NIN successfully collaborated with government, health service, and civil society organizations at the provincial and commune level to conduct workshops in good agricultural practices, set up Little Sun counseling centers, and supply school meal programs in preschools.


⁷ NIN is the government agency appointed to lead the development of NPAN.

Conclusions

More than one solution often is needed to address food security and malnutrition, particularly in children. A food-system approach can improve the understanding of complex causalities between public-policy interventions and private investment decisions and enable insights into impact pathways that lead to multiple food-system outcomes for different stakeholders (Brouwer et al., 2020). It provides the basis for a comprehensive set of interventions. The conceptual model designed for the ECOSUN project helped us to organize and systematically tackle the various facets of a food-system approach to set up a viable food-fortification strategy that would support local food security and improved nutrient status in infants and young children. It also identified various local stakeholders and actors who need to be involved in the process and mapped how to engage local smallholder producers, both as suppliers and consumers, particularly women as they are often farmers as well as mothers.

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According to Shilomboleni and De Plaen (2019), one of the key lessons in scaling up research-for-development innovations in food and agricultural systems is ensuring that innovations are embedded within local socio-ecological systems. Overall, strategies for overcoming the challenges and guaranteeing the uptake of the FCF innovations introduced in the ECOSUN project were grounded in the local food-system model that the project team developed. That approach, more than the individual activities, is the project's main characteristic and contribution. 

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Appendix. ECOSUN Handout (Front and Back)

Scaling Up Local Production of Fortified Foods in Vietnam to Improve Food Security and Nutrition



Cải thiện An ninh thực phẩm hộ gia đình phụ nữ nông thôn nghèo thông qua mô hình chế biến thực phẩm dinh dưỡng quy mô nhỏ ở Việt Nam



SUMMARY

Researchers from Vietnam and Canada are tackling poverty and malnutrition among women and children with fortified foods that use locally grown crops, local manufacturing facilities, and local distribution channels. The project is focused on three provinces of northern Vietnam: Lao Cai, Lai Chau, and Ha Giang.

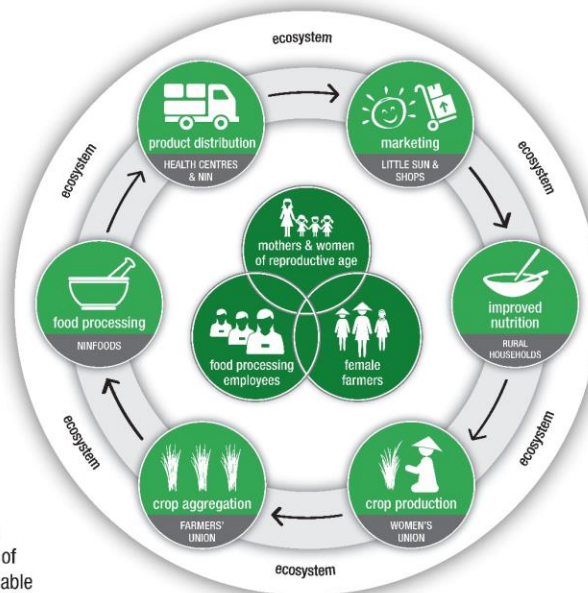
PROJECT DESCRIPTION

Vietnam's National Institute of Nutrition (NIN) is working with Ryerson University's researchers to bring sustainable solutions to rural Vietnam. These include the direct procurement of crops from smallholder women farmers, the decentralized production of fortified foods in small local food processing facilities, and a reliable commercial supply chain that sees products purchased by hundreds of nutrition counseling centres.

The Vietnam Women's Union will act as the main liaison with the women farmers who will receive training on agro-ecological practices, post-harvest handling, food safety, and how to form producer associations.

EXPECTED RESULTS

- + Improved livelihoods, nutrition and food security for thousands of rural Vietnamese
- + Increased health and productivity
- + Reduced post-harvest losses; increased shelf-life of foods
- + Reduced reliance on imports of fortified foods
- + Reduced local prices of nutritious foods for young children
- + Established reliable market for female farmers to sell local crops and support income generation
- + Local job creation, with particular focus on women
- + Evidenced-based model to inform development and implementation of national food security policies such as Vietnam's National Nutrition Strategy



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STRATEGY

Using a food systems approach, the project comprises three main components:

1. The direct procurement of crops from small-scale women farmers;
2. The decentralized production of fortified complementary foods for children in a small-scale food processing (SSFP) facility;
3. The distribution of the products to nutrition counselling centres and local vendors.

NINFOOD, a business oriented subsidiary of NIN, developed the ECOSUN product line of fortified complementary foods for children and ran acceptability tests in local communities within the project sites in northern Vietnam. The two main products are CHAO NGON instant rice porridge fortified with Iron and Zinc, and VICA vegetable powders fortified with multiple micronutrients (Calcium, Magnesium, Manganese, Zinc and Vitamin D).



OUTCOMES



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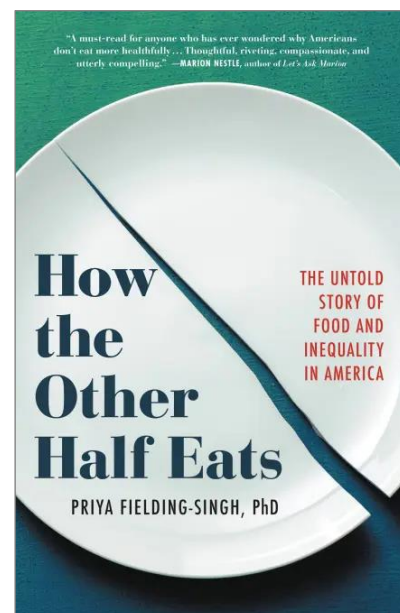
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Food inequality: One part of a much larger problem

Review by Jules Hathaway *
University of Maine

Review of *How the Other Half Eats: The Untold Story of Food and Inequality in America*, by Priya Fielding-Singh. (2021). Published by Little, Brown Spark. Available as hardback, trade paperback, eBook, and audiobook; 352 pages. Publisher's website, which includes a reading group guide: <https://www.littlebrown.com/titles/priya-fielding-singh-phd/how-the-other-half-eats/9781549183225/>



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In 2014, researchers ascribed the growing nutritional inequality in America to two factors: the price of wholesome foods and geographic inaccessibility for families living in food deserts (Wang et al., 2014). Priya Fielding-Singh believed that the causes had to be much more complex than that. As a doctoral student in sociology at Stanford University, she conducted an ethnographic study that involved interviewing 160 parents and children and extensively observing four families. Her findings, reported in *How the Other Half Eats: The Untold Story of Food and Inequality in America*, reveal

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the complexity of causes, as she was expecting, of growing nutritional inequality. She also addresses the need to see food inequality as one interconnected facet of socioeconomic inequality rather than as a standalone problem.

In Part 1, *Divides*, Fielding-Singh introduces the four families she observed in depth. She disproves some popular theories that experts use to explain food inequalities that portray lower-income parents as uncaring or ignorant. Among the families she interviewed and observed, there was no class difference in commitment to child welfare. There was also general agreement on what constitutes a healthy diet. As to the geographic and cost factors considered to be the determinants of food inequality, cost emerges as one key factor among many, while proximity does not seem to matter. Nearly all the families she interviewed had access to a car and the willingness to drive further to get better quality food.

In Part 2, Nourishment, Fielding-Singh explores some not-so-obvious factors in nutrition decisions. One involves the role of parents in vetoing or allowing fast food in a world of abundance or a world of scarcity. Upper-income parents agree to most of their children's requests, such as summer camp. For a low-income parent, fast food may be the only request she can afford to agree to. There are also cultural associations that lead to foods highly similar in calories and nutritional value falling on opposite sides of the good food/bad food divide.

Part 3, Compromises, explores some important constraints on the parents in charge of nutrition, usually the mothers. Working mothers at all points on the economic spectrum felt time pressure but dealt with it in different ways. Low-income mothers with physically demanding jobs and neighborhood perils from which to protect children were the most likely to default to fast food. The most affluent mothers outsourced at least part of their food work, using money to compensate for lack of time. Immigrant mothers faced formidable cultural tensions when deciding whether to feed their children traditional foods, American foods, or a combination of both.


Fielding-Singh had expected that low-income parents would experience more anxiety about feeding their children than their high-income peers. However, evidence pointed to the opposite. In Part 4, Emotions, she presents psychological reasons for this paradox centered around the concepts of downscaling and upscaling. Downscaling is achieved by parents who routinely experience extreme stressors such as job losses and evictions. It involves feeling good about what they can accomplish rather than bad about where they fall short. More privileged parents upscale, raising parenting standards in all things, including feeding. Related insights are that privileged parents, who see control as a possibility, will see it as an obligation, and that for parents facing challenges such as dangerous neighborhoods and extreme poverty, correct feeding of children

might not be as high priority.

Section 5, Where We Go, outlines a plan for resolving food precarity and inequality. It presents nutritious food as a fundamental human right that must be addressed at the societal rather than individual level. Policy changes are essential components. Affordable housing, a living wage, sick and vacation leave, preschool, and health care for all would go far toward achieving this goal. The corporations that relentlessly market unhealthy foods to children must be held accountable. We all must shift the way we talk about other people's food choices from individual blame and shame to a voice of compassion and affirmation.

Although Fielding-Singh initially sought with this book to show that cost and geographic accessibility are not the only factors in food inequality, the biggest contribution she made to current understanding and future research is her embedding throughout the book the idea that this problem is only one facet of a larger problem of socioeconomic inequality. Some of the places where this is most obvious are her reminder in Section 2 that parents make food decisions within the context of a total environment of abundance or scarcity, her suggestion in Section 4 that other sources of inequality such as housing may outweigh nutrition as a source of concern, and in section 5 the depth and breadth of the changes she considers necessary.

The extent and intersectionality of Fielding-Singh's research make this book relevant for many fields, such as sociology, social work, education, higher education (campus food insecurity), psychology, food systems, community development, and economics. It is more for the practitioner than the academic researcher. Fielding-Singh meant for the book to be user-friendly for people without advanced degrees. Activists in the areas of women's rights and antiracism will find much to inspire their important and necessary work. It would also be an enjoyable read for undergraduates in food science or sociology classes.



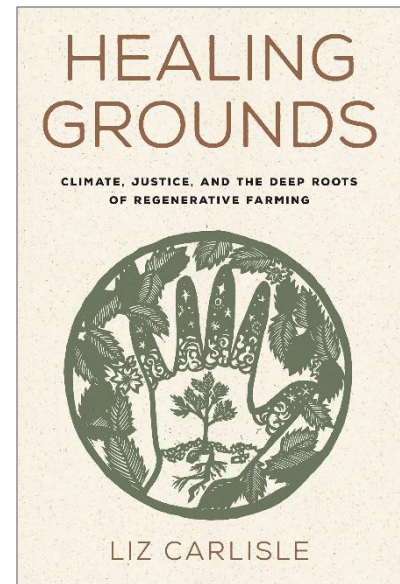
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<https://doi.org/10.1001/jamainternmed.2014.3422>

Regenerative agriculture and racial justice

Review by Natasha Shannon *
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Review of *Healing Grounds: Climate, Justice, and the Deep Roots of Regenerative Farming*, by Liz Carlisle. (2022). Published by Island Press. Available as hardcover and eBook; 200 pages. Publisher's website, which includes teaching materials from students: <https://islandpress.org/books/healing-grounds>



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At a time when regenerative agriculture has come under increasing scrutiny for murky definitions (Newton et al., 2020), corporate dilution (Nargi, 2020), and a lack of attention to racial justice and land access (Fassler, 2021), Liz Carlisle's *Healing Grounds: Climate, Justice, and the Deep Roots of Regenerative Farming* (2022) offers an expansive, justice-oriented understanding of regenerative

agriculture. In *Healing Grounds*, Carlisle makes the case that the regenerative farming practices gaining popular traction are not new but are instead deeply rooted in the agricultural traditions of Black, Indigenous, and people of color (BIPOC) communities across the globe. To unearth these deep roots, Carlisle features the stories and work of several BIPOC women leaders in regenerative agriculture, weaving in a wealth of interviews, archival research, and historical data to examine structural agricultural injustices and the multitude of regenerative farming practices sustained by BIPOC communities.

Like many enthusiasts, Carlisle first encountered regenerative agriculture through concerns about climate change and the promising possibility of recapturing carbon underground through soil-friendly farming practices. However, after learning from farming communities of color in the process of her research, Carlisle realizes that “this story of

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climate and agriculture [is], fundamentally, a story about racial violence” (p. 10). She argues that, for regenerative agriculture to live up to its climate-healing aspirations, it must first attend to the extractive, colonial logics that birthed and continue to uphold the contemporary food system. The argument that agricultural and climate justice requires racial justice is—like regenerative farming practices—also not new, but currently remains on the margins of broader regenerative agriculture conversations. *Healing Grounds* enters this conversation using a deft storytelling approach that captures and delicately balances the global, historical breadth of BIPOC regenerative farming practices with the depth of commitments to justice by individual movement leaders.

In Chapter 1, Carlisle introduces Latrice Tatsey, a member of the Amskapi Piikani (Black-foot) Nation who is researching buffalo restoration programs on the prairie. These efforts seek to rekindle the mutually flourishing relationships between buffalo, the once carbon-rich native grasslands, and Indigenous plains peoples. Chapter 2 then introduces Olivia Watkins, a Black agroforester returning to steward North Carolina land held by her family for generations. In conversation with Watkins, Carlisle points to the rarity of such intergenerational land tenure in the face of historical “federal farm programs [that were], essentially, a means to transfer capital from the Black community to the White community” (p. 57).

In Chapter 3, readers meet Aidee Guzman, a Chicana soil ecologist whose research demonstrates the benefits of above-ground crop diversity for underground mycorrhizal fungal diversity. Guzman also emphasizes diversity in farming communities themselves, as the immigrant farmers she works with in California’s Central Valley are incorporating regenerative farming traditions from their homelands. In Chapter 4, readers meet Keu Yang Moua, a Hmong farmer in California whose crop diversity supports beneficial soil fungi and also provides her diverse customer base with culturally appropriate produce. Referencing rotational swidden agricultural practices from Southeast Asia and the broad Asian roots of composting, Carlisle illustrates the painful irony of Asian American farmers’ struggle to access the land tenure and infrastructure neces-

sary to effectively implement these long-term ancestral practices.

Carlisle ultimately concludes from her interviews that “the future of regenerative agriculture hinges on whether the people needed to practice it are afforded stable access to land” (p. 161). Thus, the book wraps up with land justice advocates Stephanie Morningstar, Neil Thapar, and Mai Nguyen, who present alternative land trust models that seek to increase access for BIPOC communities and eventually move beyond “land as property” conceptions altogether. Carlisle leaves readers with the final lesson from her interviewees: “healing the climate means healing land . . . and healing land means healing colonization” (p. 177).


Carlisle’s compelling narrative style draws readers into individual stories without losing sight of critical historical and structural elements. The content is thoroughly researched, well-documented, and covers remarkably wide ground while maintaining focus. Carlisle’s conversational and delightfully engaging prose makes this book accessible to academic and non-academic audiences alike.

Healing Grounds makes a timely and critical intervention, particularly given regenerative agriculture’s recent rise in popularity and concerns about its dilution and greenwashing. Carlisle charts a clear, challenging, yet hopeful path forward for regenerative agriculture and food systems justice, one that requires deep systemic change, racial justice, and BIPOC leadership. She identifies key levers for change, including confronting racialized disparities in access to land, exploitative farm labor structures, and the “agriculture as domination” (p. 10) paradigm. These are daunting but necessary tasks for a truly regenerative agriculture.

Interestingly, Carlisle does not make explicit her reasons for choosing this “regenerative” framing, even though, as she points out, some farmers she spoke with do not necessarily adopt the “regenerative” label for themselves. Carlisle’s promotion of a social justice foundation for regenerative agriculture may lead readers to wonder why she did not use agroecology as a framing, with its well-established activist orientation. However, the “regenerative” frame does aim Carlisle’s intervention squarely at regenerative agriculture advocates, potentially bringing vital, needed conversations

about racial justice to spaces unfamiliar with agroecology. Carlisle also traces an excellent, informative history of the agroecology movement in Chapter 3. Still, a discussion of her overarching terminology choice, however brief, could make the intentions clearer for readers curious about the politics of the “alternative” agriculture lexicon.

Terminology aside, Carlisle invites readers to accompany her own learning journey with a welcoming tone and a gentle but insistent call to action. Her commitment to learning from and centering BIPOC expertise provides an important example for regenerative agriculture communities

that have struggled to address equity and racial justice, particularly in the United States. Indeed, *Healing Grounds*’ scope remains within the U.S.; although Carlisle skillfully documents regenerative farming’s global roots, the primary interviewees and takeaways remain rooted in U.S. contexts. Even so, any reader interested in the now world-wide conversations around regenerative agriculture has something to learn from *Healing Grounds*, which once again reminds us that *healing* the land from extractive agriculture and climate change cannot and will not happen without racial justice. 

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An approachable companion text for introductory food law students — and other readers

Review by:

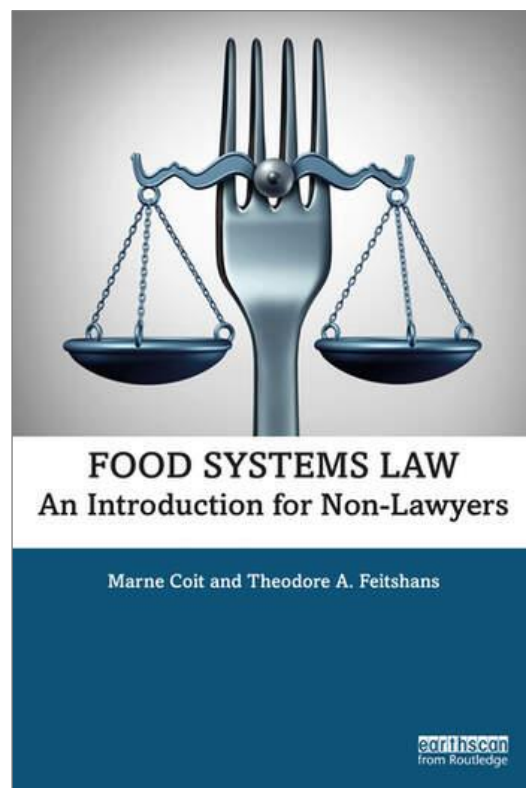
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Review of *Food Systems Law: An Introduction for Non-Lawyers*, by Marne Coit and Theodore A Feitshans. (2020). Published by Routledge. Available as hardback, paperback, and eBook; 214 pages. Publisher's website: <https://www.routledge.com/Food-Systems-Law-An-Introduction-for-Non-Lawyers/Coit-Feitshans/p/book/9781138386891>



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Marne Coit and Theodore A Feitshans's *Food Systems Law: An Introduction for Non-Lawyers* is a broad primer providing explanations of the complex regulatory landscape of the American food system. Students and other readers will benefit from the presentation of the material—both in its clarity and through the many examples that ground

the information in real-world issues. Because this book is tailored for legal and general audiences alike, for use in a college class, *Food Systems Law* is likely best suited for upper-level undergraduate stu-

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dents or graduate students. This book provides information needed for readers to understand the scope, nuance, and unresolved conflicts in food law. In doing so, the book presents background information that is approachable for readers unfamiliar with the fundamentals of U.S. law and policy.

The introductory chapters, beginning with a discussion of food systems, frame complex discussions of “food systems” in a way that readers will find more approachable than other, more theoretical expositions. Chapter 1 introduces the concept of “food systems” directly, succinctly, and pragmatically. As food systems, and consequently the regulation of food systems, are broad in scope and interdisciplinary, introductory discussions of the food system could easily be bogged down and become unclear. The authors avoid this pitfall by grounding the discussion in clear definitions and examples.

Similarly, chapters 2 and 3 dive into the complex work of the American legal and political system; the regulation of food highlights many of the inefficiencies and complexities in our legal system. Much as with the discussion of “food systems,” the authors take a direct route to explaining the structure of the American legal system. However, the authors do not fail to call readers’ attention to the many criticisms of this method of regulation. At times, these chapters read as disjointed and lacking cohesion—although this may just reflect the subject matter rather than solely the authors’ exposition.

Chapter 4 discusses the farm bill, a topic that many food and agriculture professors hesitate to introduce early because of the complex nature of the bill’s content, procedure, and policy. However, Coit and Feitshans present the farm bill in a way that highlights its key aspects and pushes readers to continue questioning: *how did American agricultural policy get here?* By providing a history of the farm bill, readers better understand the often convoluted and highly technical programs in the bill. It is crucial that food and agriculture students and other readers understand controversial farm bill programs, such as commodity subsidies and nutrition programs, because these contentious programs do not exist in a vacuum; rather, by understanding the farm bill programs, readers are more capable of un-

derstanding how food law and policy impact everyone.

In Chapter 10, the authors attempt to brief the complex regulatory system of labor in the food and agriculture system. The authors provide a cursory review of wage and hour, immigration, employment at will, employment discrimination and harassment, family medical leave, healthcare, labor organization, workers’ compensation, unemployment insurance, and migrant agricultural workers protection laws. Through an illustrative case example, the authors keenly note how circuit court precedent in one circuit might affect an employer who employs labor across circuits. In discussing immigration law related to agricultural labor, the authors focus more on the particularities of the I-9 verification process than the verbosity of H-2A visa program requirements—seemingly glossing over essential details of one of the most important visa programs for migrant workers. Similarly, the authors fail to examine the historical implications and outcomes of a tipped wage system on restaurant laborers. The authors do provide a detailed explanation of laws concerning employment discrimination and harassment. Overall, this chapter is beneficial to whet the appetite of readers interested in understanding several laws that affect restaurant and agricultural laborers.

In Chapter 12, the authors elucidate the interrelation between food access and food security, indicating that there is little relevant federal law in this area except that of nutrition programs in the farm bill. The authors provide a comprehensive review of both retailer and participant requirements for the Supplemental Nutrition Assistance Program (SNAP), while also acknowledging the political debate surrounding the effectiveness of these requirements. This discussion inspires the reader to think critically about the policy implications surrounding food welfare programs and to consider how other policy alternatives could work better to affect to the food security problem.

Overall, Coit and Feitshans seek to engage the novice reader in numerous topics across the entirety of the food systems. Those already introduced to food law will appreciate the lack of frills in presenting the material. Similarly, this book focuses on food law more so than food policy.

Introductory students, particularly those with little to no legal background, will benefit most from this book if it is used as a companion text to an additional source that provides the crucial policy explanations underpinning these laws. Because this text covers an incredibly broad topic, it lacks specificity and depth in some topics, which food law experts may find less useful than a more specific treatise. However, for those looking

for an introductory text to food law, this book covers all the necessary bases. Students and other readers will appreciate the non-legalese, conversational tone of the book, which makes a complex legal and regulatory system approachable to those working beyond the legal profession. Those curious minds seeking to plant their first seed in the world of food and agricultural policy will be delighted by *Food Systems Law*.

