Journal of Agriculture, Food Systems, and Community Development
ISSN: 2152-0801 online
https://foodsystemsjournal.org

The experience of Vermont local food businesses during the first year of the COVID-19 pandemic

Claire Whitehouse,[a] * David Conner,[b] Lisa Chase,[c] and Travis W. Reynolds [d]
University of Vermont

Submitted August 4, 2022 / Revised October 21 and November 9, 2022 / Accepted November 10, 2022 / Published online February 13, 2023

Citation: Whitehouse, C., Conner, D., Chase, L., & Reynolds, T. W. (2023). The experience of Vermont local food businesses during the first year of the COVID-19 pandemic. *Journal of Agriculture, Food Systems, and Community Development*, *12*(2), 201–214. https://doi.org/10.5304/jafscd.2023.122.003

Abstract

The COVID-19 pandemic tested the resilience of food system actors at all levels and across all geographies. This study focuses on the experience of Vermont local food businesses by combining two surveys conducted in the first half of 2021: one of foodservice operations that procure food locally and one of Vermont farms that sell directly to consumers. We analyzed descriptive statistics, open responses, and conducted Kruskal-Wallis rank sum tests to assess which factors were related to businesses' financial statuses before and since the pandemic. Pre-pandemic financial status was related with business type, whether the business went on to receive emergency funds, and financial status since the pandemic. The only significant factor for financial status since the pandemic was prepandemic financial status. We close with recommendations for policy and future research.

Keywords

COVID-19, Pandemic, Vermont, Foodservice, Restaurants, Farms, Direct Sales, Local Food, Resilience, Emergency Funding

[a] * *Corresponding author:* Claire Whitehouse, Graduate Research Assistant, Food Systems Program, University of Vermont; Morrill Hall, 146 University Place; Burlington, VT 05405 USA; claire.whitehouse@uvm.edu

Claire Whitehouse is now a research specialist at the Center for Rural Studies at the University of Vermont. Contact information is the same as above.

[b] David Conner, Professor, Department of Community Development and Applied Economics, University of Vermont; david.conner@uvm.edu

[c] Lisa Chase, Extension Professor, University of Vermont Extension, Vermont Tourism Research Center; lisa.chase@uvm.edu

[d] Travis W. Reynolds, Associate Professor, Department of Community Development and Applied Economics, University of Vermont; twreynol@uvm.edu

Funding Disclosure

This research was funded through a COVID-19 research grant from the University of Vermont Agricultural Research Service (ARS) Food Systems Research Center.

This work was also supported by the USDA National Institute of Food and Agriculture, Hatch project VT-H02809MS (Accession Number 7000541).

Author Note

A version of this article is included in Claire Whitehouse's master's thesis. Claire Whitehouse also gave a virtual lightning talk on the results of this study at the 2022 conference of the Agriculture, Food, and Human Values Society.

Introduction

Over the past 20 years, a wide variety of disciplines have embraced the concept of resilience, which is broadly understood as a system's ability to respond to major shocks (Behzadi et al., 2017; Béné, 2020; Béné & Doyen, 2018; Magis, 2010; Schipanski et al., 2016; Tendall et al., 2015; Toth et al., 2016; Worstell & Green, 2017). Food systems research in particular has moved toward resilience in light of climate change, natural disasters, and the COVID-19 pandemic (Béné, 2020; Boyacı-Gündüz et al., 2021; Ericksen, 2008; Food and Agriculture Organization [FAO] of the United Nations, 2013; Tendall et al., 2015). This paper begins by summarizing insights from food systems resilience research before and since the COVID-19 pandemic. We then test how resilience indicators from the literature apply to a specific group of food systems actors: Vermont foodservice operations and farms selling directly to consumers.

Tendall et al. (2015) defined food system resilience as "the capacity over time of a food system and its units at multiple levels, to provide sufficient, appropriate and accessible food to all, in the face of various and even unforeseen disturbances" (p. 19). Scholars have identified many potential indicators of food system resilience. These include ecologically sustainable agricultural practices (Schipanski et al., 2016; Worstell & Green, 2017); diversity and redundancy in the food supply chain (Behzadi et al., 2017; Béné, 2020; Schipanski et al., 2016; Worstell & Green, 2017); sufficient reserves and physical infrastructure to withstand disturbance (Baum et al., 2015; Worstell & Green, 2017); local self-organization and independence of food supply chain actors (Baum et al., 2015; Schipanski et al., 2016; Worstell & Green, 2017); flexibility and creativity of food system actors (Béné, 2020; Borges-Méndez & Caron, 2019; Schipanski et al., 2016; Worstell & Green, 2017); strong relationships among and between food supply chain actors (Béné, 2020; Worstell & Green, 2017); financial resources (Béné, 2020); social and economic equality (Béné, 2020; Borges-Méndez & Caron, 2019; Schipanski et al., 2016); and the ability or willingness to transform (Béné & Doyen, 2018; Worstell & Green, 2017).

The resilience framework is not without its detractors. Scholars including Joseph (2013) and Borges-Méndez and Caron (2019) critique dominant ideas of resilience for reinforcing neoliberal and colonialist modes of governmentality. The theme uniting these critiques is to consider the role of government in system resilience. As we move to the case of COVID-19 and the food system, we will keep government in frame and examine how its actions or inactions promoted or prevented food system resilience.

Food System Resilience During the COVID-19 Pandemic

Resilience consists of capacities that are built and strengthened in times of stability, but the resilience of a system can only be assessed once it has experienced a shock. The profound and protracted crisis that is the COVID-19 pandemic has inspired vast amounts of food system resilience research. Yet the field is still nascent, especially when it comes to assessing the resilience of food businesses.

Foodservice

Many published studies of the impact of COVID-19 on restaurants, foodservice, and hospitality have examined business operator perspectives in the first several months of the pandemic, when many governments across the globe had imposed lockdown states that made conventional business impossible (Farrer, 2020; Gkoumas, 2021; Madeira et al., 2021; Neise et al., 2021). Key findings from these studies include the desire for government assistance and public health guidance (Gkoumas, 2021; Madeira et al., 2021); the benefit of fiscal stability going into the pandemic (Neise et al., 2021); and the importance of offering takeout and delivery to survive, along with the difficulty of sustaining a business on dine-out options alone (Farrer, 2020; Neise et al., 2021). These early foodservice studies are limited in utility: they assess owners' perceptions of their business's future without following up about how their expectations played out.

Several studies take a backward look at the results of business adaptations and experiences during the first pandemic spring. A mixed-methods study by Brizek et al. (2021) surveyed and interviewed independent restaurant operators in South Carolina in May and June 2020, when restaurants

were allowed to reopen indoor dining at limited capacity. Nearly 25% of restaurant operators were not able to reopen their businesses, and the remaining 75% were operating at reduced capacity supplemented by takeout or delivery. Many were interested in government aid programs, but most could not rehire enough employees to be eligible for Payroll Protection Program (PPP) loan forgiveness. In one of the few articles on institutional foodservice during the COVID-19 pandemic, Connolly et al. (2021) examined Connecticut public school meal programs in the spring of 2020 and identified four main factors for success: tailoring programs to community needs, facilitating participation, using partnerships to coordinate efforts, and building flexible programs.

Local Agriculture

Farm businesses, unlike foodservice businesses, were not forced to close during lockdowns, and several studies of small, diversified, organic, and/or agroecological farms suggest that these operations fared well during the pandemic's first wave (Mastronardi et al., 2021; Perrin & Martin, 2021; Tittonell et al., 2021). Contributing resilience factors identified by these studies include processing the product on the farm (Perrin & Martin, 2021); direct sales and/or short supply chains (Mastronardi et al., 2021; Perrin & Martin, 2021; Tittonell et al., 2021); nimbleness in shifting between sales channels (Mastronardi et al., 2021; Perrin & Martin, 2021); strong collaborative local food networks (Tittonell et al., 2021); and government support (Tittonell et al., 2021).

Another group of studies takes a broader look at local food systems and short supply chains during the COVID-19 pandemic. Nemes et al. (2021) surveyed alternative and local food system experts from 13 countries and found that these systems were able to respond to the pandemic with innovation, though smallholder access to e-commerce varied among countries. Thilmany et al. (2020) reviewed regional and local food systems in the United States during the first 6 months of the pandemic; they found that while school and restaurant closures created a major market disruption, e-commerce sales of local food exploded. Yet an analysis of Washington, D.C., farmers market sales data using a difference in differences model to compare winter and spring 2020 sales to those in 2019 identified negative impacts on direct food sales due to COVID-19 (O'Hara et al., 2021). O'Hara et al. (2021) found that even those markets that did open and remained open throughout the first pandemic spring experienced a profound drop in sales; only vendors selling dairy, meat, and seafood increased sales year over year.

COVID-19 Research Summary

The field of COVID-19 food systems research is at the same time already immense and still lacking. There are many published studies looking at the first 3 to 6 months of the pandemic, but the COVID-19 pandemic has been one continuous multiyear crisis, and individuals, businesses, and communities have had to attempt recovery while the crisis is ongoing. Resilience research needs to continue past the eventual end of the pandemic to assess how actions throughout this period have affected the stability of the food system.

The scale of the COVID-19 pandemic has also meant that some system components have been overlooked by research, and some related actors have not been considered alongside each other. There have been few whole-picture studies of the experiences of farms selling direct to consumers, and studies of foodservice operations during COVID-19 have not focused on those engaged in local procurement. Moreover, while consumers purchase local foods both by buying raw ingredients from farms and by patronizing restaurants and cafeterias that use local ingredients, the two sectors have not been considered alongside each other. This study will look at foodservice operations procuring local food and farms selling directly to consumers to get a fuller picture of the experience of local food vendors in Vermont during the pandemic.

Vermont as a Special Case

Vermont is an interesting case for both alternative food systems and its experience during the pandemic. Vermont is home to many local food initiatives. Organizations like Vermont Farm to Plate, the Vermont Fresh Network, Center for an Agricultural Economy, and Farm to Institution New

England advocate and organize for local agriculture to reach consumers through both direct purchasing and foodservice. Outgoing senator Patrick Leahy has been a long-time champion of farm-to-school programs at the federal level, and the Vermont state legislature recently passed a local foods purchasing initiative for public schools (An Act Relating to Equitable Access to a High-Quality Education through Community Schools, 2021).

Vermont fared well during the first year of the COVID-19 pandemic compared to the rest of the United States, with robust leadership from state government and low case and death numbers (Deliso, 2020). The Vermont state government sponsored several relief initiatives for food businesses, and a coalition of food access and business development advocates assembled the FEMA-funded Vermont Everyone Eats program that paid for food insecure individuals to eat meals from Vermont restaurants (Agency of Agriculture, Food and Markets, n.d.; Agency of Commerce and Community Development, n.d.; Bianchi et al., 2020).

Between well-established and supported short local food supply chains and Vermont's low COVID-19 case numbers, Vermont's local food economy should have been well-positioned to weather the pandemic. This study will examine Vermont food businesses selling local food to consumers as a special case. To what extent and how were these businesses set up for success? And what factors, if any, were related with their economic wellbeing a year into the COVID-19 pandemic?

Methods

Survey Questions, Sampling, and Collection

This paper combines two surveys conducted by University of Vermont (UVM) researchers under Agricultural Research Service grants. The first survey focused on foodservice operations in the state of Vermont. We wrote some survey questions to align with those on other surveys of Vermont food system actors during COVID-19 conducted by our UVM colleagues. Other questions came out of interviews we conducted with owners or managers of Vermont foodservice operations in the second half of 2020. Colleagues in the broader UVM COVID-19 food system research team reviewed multiple drafts of the survey text and tested the survey in Qualtrics.

In April 2021, we distributed the survey via Qualtrics to the culinary members of the Vermont Fresh Network, a nonprofit organization that connects farmers, chefs, and consumers in the state of Vermont. The culinary member email list (n=150) is composed of owners, managers, and/or chefs at Vermont restaurants, caterers, prepared food sections of grocery and specialty stores, and institutional foodservice operations. We followed up with direct email reminders to this list in May and June of 2021. This effort yielded 22 valid responses. In an attempt to increase the survey response, we reached out to the Vermont Independent Restaurant Association and the Main Street Alliance, both of which shared our survey link in their summer 2021 newsletters; however, this only yielded three additional responses. In total, we received 20 complete responses and five partial responses to the foodservice survey. We expected a low response rate due to the demands of foodservice businesses, compounded by spring 2021 restaurant staffing shortages.

We developed the farm survey questions through a constant comparative analysis of transcripts from six webinars. UVM Extension hosted these webinars in the spring of 2020 to help farmers adjust to shifting conditions and regulations at the start of the pandemic. Team members used the themes identified in the coding process to write the survey. We consulted with the broader UVM COVID-19 food systems research team to ensure common language across projects. We also hired 10 farmers from multiple sectors to review the draft survey. We distributed the final survey via email, social media, paid advertisements on Front Porch Forum (a website that hosts neighborhood-specific forums across Vermont), and professional networks. This outreach totaled more than 12,000 emails and 90,000 paid "impressions," and resulted in 135 valid responses. For this study, we narrowed the respondents to those who sold products directly to consumers in 2019 and/or in 2020 (n=111). Eligible sales avenues included U-Pick, farm stands or farm stores, community supported agriculture, farmers markets, sales to SNAP or 3SquaresVT users, and website or e-commerce sales. We coded

the business types to distinguish between those farms with an onsite farm store or farm stand and those without.

The foodservice and farm surveys shared several similar questions, and we were able to combine these portions of the two datasets in RStudio, creating a total dataset of 136 businesses. The shared questions fell into three main sections: through which avenues the businesses sold food both before and since the COVID-19 pandemic; where businesses turned for funding and information during the COVID-19 pandemic; and questions on the financial status of the business before and since COVID-19. UVM Extension associate professor Mark Canella developed these latter two questions, which sorted business performance into four main categories: economically thriving, economically viable, sustainable (due to other sources of income or equity), and vulnerable. While this self-reported categorization is not as precise as direct financial information, the UVM COVID-19 food systems research team elected to use these questions across all surveys because they give a sense of business status without requiring significant effort from the respondent. The definitions differed slightly between the two surveys, and the farm survey divided the "sustainable" category into two sections (Table 1). For this study we recoded these two "sustainable" categories into one encompassing all nonviable operations that were able to continue operations by relying on other funds.

Conceptual Model

We set out to investigate two questions: were these Vermont local food businesses selling food to consumers resilient in the first year of the COVID-19 pandemic, and if so, what factors impacted that resilience? We used the two financial status questions as proxies for business resilience. We considered financial status before the pandemic to be a component of resilience potential and financial status since the pandemic to summarize how the business weathered the prior year. As the financial status questions were ordinal (thriving, viable, sustainable, vulnerable), we used the Kruskal-Wallis rank sum test to examine the relationship between financial status before and since the pandemic with each independent variable in our conceptual model. Because the combined dataset is weighted toward the farm survey, we supplemented these tests with an in-depth review of the descriptive statistics and the open responses to the foodservice survey.

We selected the independent variables for the analysis based on our review of the literature (Figure 1). Across the diverse early studies of

Table 1. Financial Status Definitions Across Both Surveys

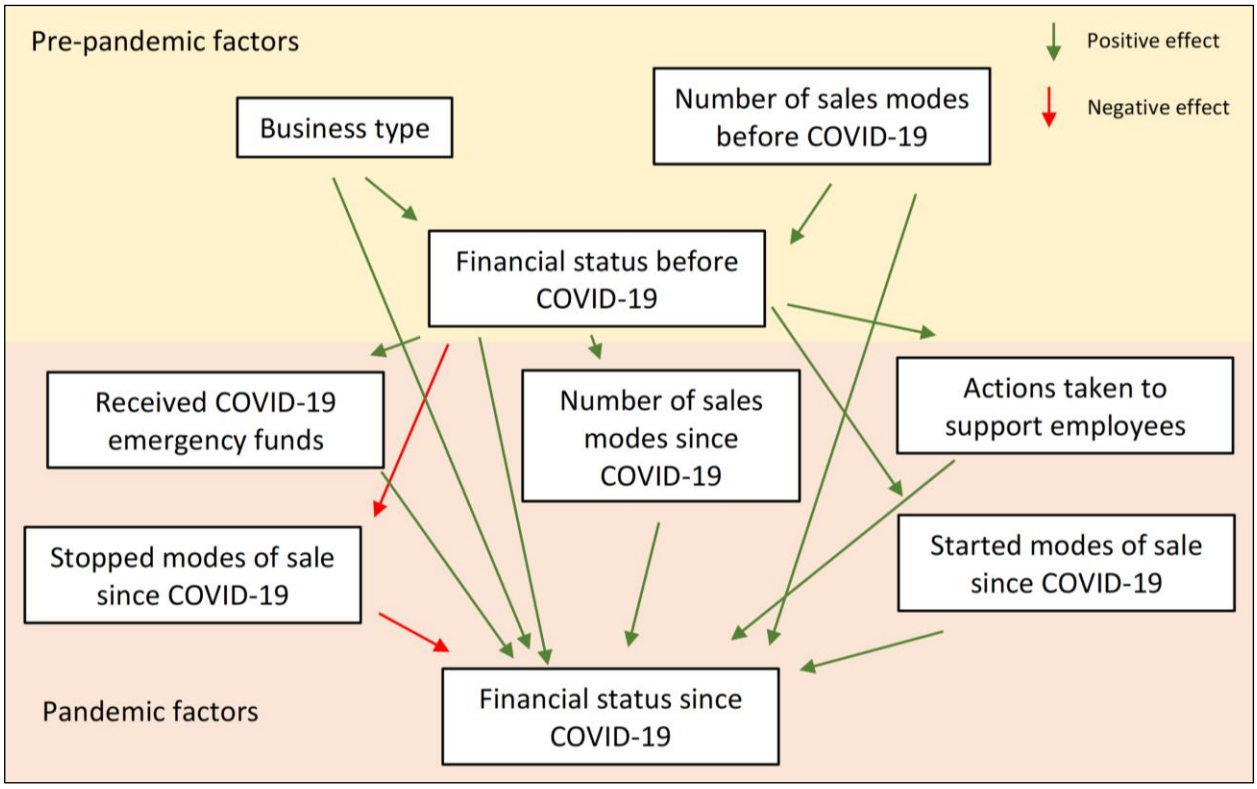
Combined Survey Category	Foodservice Survey	Farm Survey
Economically thriving	The operation exceeds minimum fair labor and wage standards for all owners and employees, provides benefits (e.g. health insurance), covers all costs, and generates a profit.	The farm exceeds minimum fair labor and wage standards for all owners and employees, provides health insurance, covers all costs, and generates a profit.
Economically viable	The operation has the capacity to pay all employees average industry wages, cover all costs, and generate a profit.	This business has the capacity to pay family labor at the average agricultural wage, cover all costs, and generate a profit.
Sustainable	This operation does not meet the "economically viable" definition (above) but is sustainable due to the presence of built-up equity in savings, property, and owned assets, or is a nonprofit organization raising money through grants, donations, and other unearned income.	*Sustainable—Built Equity:* This business is not "economically viable" but is sustainable due to the presence of built-up equity in savings, property, and owned assets. *Sustainable—Other Income:* This business is not "economically viable" but is sustainable due to the presence of other non-farm/food business income.
Vulnerable	The operation is not "economically viable" and does not have sufficient sources of other income or built-up equity, earned or unearned.	This business is not "economically viable" and does not have sufficient sources of other income or built-up equity.

COVID-19's impact on agriculture and foodservice businesses worldwide, the food system resilience indicator mentioned the most is the flexibility and creativity of food system actors (Brizek et al., 2021; Connolly et al., 2021; Duarte Alonso et al., 2020; Farrer, 2020; Mastronardi et al., 2021; Neise et al., 2021; Nemes et al., 2021; Perrin & Martin, 2021; Thilmany et al., 2020). We assessed the adaptability of businesses in our study in two ways. We created binary variables for whether businesses stopped or started one or more sales modes during the pandemic to test the flexibility of the customer-facing end of the business. We predicted that stopping sales modes would be negatively related with financial status before and since the pandemic, whereas starting new sales modes would have a positive relationship. We examined the flexibility of internal operations using the questions from the foodservice survey about what actions businesses took to support employees. Due to the small size of the foodservice sample, we chose to examine cross-tabulations of each employee action question as well as the total number of actions taken with financial status before and since COVID-19, and we turned to open responses addressing this topic.

Because the resilience literature also emphasizes the importance of selling across a variety of markets (Béné, 2020; Worstell & Green, 2017), we created variables counting total modes of sale before and since the pandemic. We hypothesized that businesses selling across a diversity of markets were in better shape going into the pandemic, and that the number of markets through which they sold food since the pandemic contributed to their financial resilience.

In the COVID-19 literature, government response and assistance come up again and again, whether studies found government response to the pandemic to be helpful (Gkoumas, 2021; Thilmany et al., 2020; Tittonell et al., 2021), slow (Farrer, 2020; Madeira et al., 2021), or insufficient for addressing the problems that food businesses faced (Brizek et al., 2021). We created a binary variable for whether a business received funding to judge the impact of the government's fiscal assistance and to see whether funding favored businesses

Figure 1. Conceptual Model



who were doing well before the pandemic started.

We also created a variable for business type with three options: foodservice, farms with farm stands or stores, and farms without farm stands or stores. We hypothesized that foodservice businesses faced worse impacts from the pandemic than farms because lockdowns prohibited regular foodservice operations. We also hypothesized that farms with farm stores were more resilient than those without, as Perrin and Martin (2021) found that farms that managed their own sales were especially nimble in response to the pandemic.

Finally, we tested the relationship between financial status before and financial status since the pandemic. In using financial status before the pandemic as a proxy for resilience potential, and financial status since the pandemic as a proxy for actual resilience, we hypothesized that the strongest relationship would be between these two variables.

Table 2. Sample Description

Business Type	Count
Restaurant	8
Caterer	2
Restaurant & caterer	3
Hospital/health care foodservice	1
K–12 school foodservice	1
Grocery store or supermarket	2
Festival food vendor	1
Bakery & baking school	1
Restaurant/caterer/grocery store/ specialty market	1
Foodservice—no response	5
Farm & farm store	70
Farm	41
Total	**136**

Results

The combined sample is heavily weighted toward the farm survey: out of 136 total observations, 25 are foodservice businesses and 111 are farms (Table 2). This imbalance is especially true when looking at the financial status questions. Between non-response and entry errors, 10 foodservice businesses did not answer the question about financial status before COVID-19 (compared to two farms). Six did not answer the question about financial status since COVID-19 (along with five farms). Of the foodservice businesses that did report their financial status before COVID-19, seven were thriving, six were viable, and two were sustainable due to other funds. The majority of farms reported as either viable or sustainable pre-COVID, with five thriving and three vulnerable. Both more farms (n=10) and foodservice businesses (n=3) self-reported as vulnerable since COVID, and just two farms and three foodservice businesses described themselves as thriving. Still, the large majority of respondents self-reported as either viable (n=35) or sustainable due to other funds (n=72). As predicted, there was a significant relationship ($p<0.0001$) between financial status before COVID-19 and financial status since COVID-19; businesses that were doing well before the pandemic were more likely to be doing well since the pandemic's onset (Table 3).

Foodservice businesses were significantly more likely than farms to have been doing well before

Table 3. Comparison of Financial Status Before and Since COVID-19

Financial status since COVID-19	Since COVID-19 totals	Financial status before COVID-19			
		Thriving	Viable	Sustainable	Vulnerable
Thriving	4	3	1	0	0
Viable	34	5	25	4	0
Sustainable	69	4	9	55	1
Vulnerable	13	0	3	8	2
Before COVID-19 Totals		**12**	**38**	**67**	**3**

Note. Kruskal-Wallis H(2)=44.358, df=3, $p<0.0001$
N=120; 16 survey participants did not respond to either or both questions.

the pandemic (p<0.0001, Table 4). Nearly half of the foodservice operations that reported their financial wellbeing before COVID-19 were thriving, whereas 61% of farms sustained their businesses on other income or built equity even before the pandemic. However, there was no difference (p=0.66) between farms with a farm store or stand and those without. When turning to financial status since the start of the COVID-19 pandemic, the relationship between business type and financial status disappeared: whether the business was a foodservice operation or a farm had no relationship (p=0.22) with financial status since COVID-19.

Table 4. Financial Status Before COVID-19 by Business Type

Financial status before COVID-19	Business Type			
	Foodservice		Farm	
	Count	Percentage	Count	Percentage
Thriving	7	47%	5	5%
Viable	6	40%	34	31%
Sustainable	2	13%	67	61%
Vulnerable	0	0%	3	3%

Note. Kruskal-Wallis H(2)=20.246, df=1, p<0.0001
n=124; 12 survey participants did not list their financial status before COVID-19

The number of sales modes varied across businesses both before and since the pandemic. Most businesses sold products using between one and five sales modes, with many (n=20 pre-pandemic; n=23 since pandemic) selling through six or more modes. A combined restaurant, caterer, and market in the foodservice sample reported that they "felt fortunate to be diversified before the pandemic hit." Whereas prior to the pandemic the foodservice side of their business was their major sales driver, the retail side of the business exploded during lockdown and kept the operation afloat. But when looking at the Kruskal-Wallis tests for the combined sample of both foodservice and farms, diversity among sales modes was not a significant player in financial status before or since COVID-19.

The pandemic required most foodservice businesses to change the ways they sold food to customers. The majority stopped (n=13) and/or started (n=16) one or more modes of sale. Most farms did not change how they sold food, but a good number still stopped (n=29) and/or started (n=42) at least one mode of sale. Contrary to our hypothesis, and to the literature's emphasis on adaptability, our analysis of the combined sample found no relationship between stopping or starting sales modes and financial status for either time period.

Foodservice operations varied widely in the internal changes they made to protect and help their employees through the pandemic (Table 5). Many operations made lower-cost accommodations like providing PPE, allowing for flexible schedules and sick leave, and offering free or discounted food. Fewer made higher-cost adjustments like offering testing or hazard pay. In some cases, the fiscal reality of the foodservice business made it hard to keep staff employed. One caterer reported:

> We unfortunately had to bring our staff down to just a few people and had to constantly shift gears to try to bring in any source of revenue. It was similar to an entire year of starting a new business, over and over.

Some tools for employee wellbeing were out of employers' hands. One respondent complained that in Vermont restaurant employees were not classified as frontline workers and therefore were not able to receive the vaccine ahead of their age bracket. This complaint was justified, given that in the first 3 months of 2021 Vermont foodservice workers were infected by COVID-19 at higher rates than any other occupation in the state (Duffort & Petenko, 2021). While we did not run statistical tests due to the small sample size, cross tabulations of the number of employee actions with financial status do not suggest a relationship with financial status from either time period (Table 6, Table 7). There are thriving, viable, sustainable, and (since COVID) vulnerable businesses that all took more than five actions in support of employees. There likewise is no suggestion of relationships between financial status before or since the pandemic and each specific employee support action.

All but one (n=21) of the foodservice busi-

Table 5. Actions Taken by Foodservice Operations to Address Employee Health and Wellbeing

Action	Total Participating Operations
Provided employees with personal protective equipment (PPE) such as masks, face shields, and gloves	21
Provided employees with free or discounted food	15
Adjusted sick leave policy to allow for flexibility in the case of symptoms or exposure	14
Allowed for flexible work schedules to accommodate employees' non-work obligations	14
Retained employees on payroll during shutdowns caused by COVID-19	13
Facilitated open conversations about mental health and stress	12
Staggered staff schedules to reduce workplace capacity	10
Allowed employees to work from home where possible	7
Connected employees with mental health resources	6
Connected current or laid-off employees with emergency food resources and/or food assistance programs	6
Provided employees with hazard pay for working during the COVID-19 pandemic	5
Provided employees with regular testing for COVID-19	4
Allowed furloughed employees to stay on employer healthcare plans	2

Note. n=22, 3 respondents did not complete this question.

nesses that responded to the questions on funding and information received funding, compared to 59 out of 102 responding farms. Financial status before the pandemic was significantly related (p=0.02) with whether the business received funding after the pandemic hit. Businesses that were doing well pre-pandemic were more likely to have received funding later on, and all of the thriving businesses went on to receive funding (Table 8). There was no relationship (p=0.21) between receiving funding and financial status since the pandemic. While all five thriving businesses had been funded, so had more than half of viable, sustainable, and vulnerable businesses (Table 9).

Table 6. Financial Status *Before* COVID-19 and Total Actions Taken to Support Employees

Total actions taken to support employees	Financial status before COVID-19			
	Thriving	Viable	Sustainable	Vulnerable
1–4	2	1	1	0
5–8	5	4	1	0
9–12	0	1	0	0

Note. n=15, 10 survey participants did not respond to either or both questions.

Table 7. Financial Status *Since* COVID-19 and Total Actions Taken to Support Employees

Total actions taken to support employees	Financial status since COVID-19			
	Thriving	Viable	Sustainable	Vulnerable
1–4	0	3	3	0
5–8	2	3	4	3
9–12	1	0	0	0

Note. n=19, 6 survey participants did not respond to either or both questions.

Foodservice respondents had mixed opinions about emergency funding. One reported that the business would not have survived without the PPP and state programs. Another felt that larger businesses received more help from funding programs than small businesses. And one regretted taking the first PPP loan because it had to be paid back before the restaurant business was allowed to open. Multiple foodservice respondents celebrated the FEMA-funded Vermont Everyone Eats program, where food-insecure Vermonters received restaurant-prepared food for free and the state in turn paid restaurants US$10 for each meal (Bianchi et al., 2020). One restaurant owner reported, "The [Vermont] Everyone Eats program was a lifesaver. It's one of the few systems that works well to connect

those who grow, those who cook, and those who eat." Another celebrated how Everyone Eats strengthened their broader Vermont food network, saying, "The Everyone Eats program has introduced us to the network of restaurants and producers who care about their communities and state and want to do what they can to help."

Discussion

In this study, we used the questions on financial status as a proxy for business wellbeing and resilience. The phrasing of the categories, which encompass profitability, the ability to pay employees and at what rate, and available funds, describe what a business needs to continue operation. Because resilience is a latent capacity tested at a moment of crisis, it makes sense that business financial status before the COVID-19 pandemic was significantly related to financial status since the pandemic's onset. Where businesses stood affected where they wound up. And while three formerly viable and eight formerly sustainable businesses did become vulnerable, the majority of businesses in those viable and sustainable categories remained in place. In the face of an enormous challenge, our sample of Vermont local food businesses showed a marked resilience.

Table 8. Financial Status *Before* COVID-19 by Whether Businesses Received COVID-19 Emergency Funding

Financial status before COVID-19	Received funding? Yes	Received funding? No	% of each category that received funding
Thriving	12	0	100%
Viable	23	14	62%
Sustainable	36	29	55%
Vulnerable	1	1	50%

Note. Kruskal-Wallis H(2)=5.1175, df=1, p=0.02
n=116; 20 survey participants did not respond to either or both questions.

Table 9. Financial Status *Since* COVID-19 by Whether Businesses Received COVID-19 Emergency Funding

Financial status since COVID-19	Received Funding? Yes	Received Funding? No	% of each category that received funding
Thriving	5	0	100%
Viable	22	11	67%
Sustainable	39	29	57%
Vulnerable	7	4	64%

Note. [a] Kruskal-Wallis H(2) = 1.5665, df = 1, p=0.2107
[b] n=117; 19 survey participants did not respond to either or both questions.

But financial well-being pre-crisis, while significant, was no panacea. Foodservice businesses were significantly more likely than farm businesses to have been doing well financially before the pandemic, but we found no relationship between business type and financial status since COVID-19. The normal daily operations of foodservice, which involve serving large volumes of people, were more impacted by COVID-19 lockdowns than the daily operations of Vermont farms selling direct to consumer. Our findings speak both to how hard foodservice businesses were hit and to how hard running a small farm is even in normal times.

Financial status before COVID-19 was also significantly related to whether businesses received funding when the pandemic hit. All 12 businesses that were "economically thriving" before the pandemic received funding. This relationship has several possible intertwined explanations. Businesses that were more financially healthy before the pandemic may have had more financially knowledgeable staff with the wherewithal to apply to funding sources. Funders may have also prioritized businesses with strong financial track records. On the flipside, Demko et al. (2021) found that the financial reporting required for PPP applications was a major hurdle for farm owners. Confirming how federal and state governments, as well as other funders, allocated emergency funds would require a separate investigation of those data.

However, receiving funding was not significantly related with financial status since the COVID-19 pandemic. This result likewise has several possible explanations. It is possible that we surveyed businesses either too late or too soon to see the funding's impact. It is also possible that the funding insufficiently addressed these businesses' major obstacles. The federal funds that so many of

our respondents turned to were not designed for food businesses. One restaurant in our sample explained that they were not able to reopen and rehire staff before the end of the PPP loan term. Their complaint echoes the experience of the South Carolina restaurants surveyed by Brizek et al. (2021). The PPP was also at odds with the rhythm of farming, where activities are planned out a year ahead (Demko et al., 2021). In the continued COVID-19 pandemic and in future crises, emergency response programs tailored to and led by food business professionals, like Vermont Everyone Eats, may be more impactful.

The food system resilience literature emphasizes the importance of selling to and pivoting between a variety of markets, but our study found no relationship between either number of sales modes or changing sales modes and financial status for either time period. Each financial status category for both time periods included businesses selling through just one or two avenues as well as businesses selling across a broader range of markets. The key seems to be that businesses do what they do well, whether that means focusing their business or spreading it out. The same is true for whether businesses stopped or started sales modes: some resilient businesses were able to continue what they did well, and others made adjustments. Those businesses that did make major business changes were not hurt by doing so. It is possible that some businesses did not see any interruptions in their major markets and did not have to change. Furthermore, businesses that changed markets may have done so in a bid for survival, and their success may be measured not by financial improvement but by financial stasis. This view is supported by the open responses to the foodservice survey, where shifting markets was more common. Foodservice businesses launched new product lines, opened new wholesale accounts, and started takeout programs. Many foodservice businesses credited their ability to pivot with their survival. As one restaurant noted, shifting to reheat and eat meant a revenue reduction, "but we stayed open." It is possible that the value of market adaptability varied across sectors during the pandemic, but we do not have a sufficient sample for that investigation.

The foodservice sample was also too small to test the statistical significance of the actions businesses took to support employees, but the cross tabulations of employee actions and financial status do not suggest a relationship. Additional research with a bigger sample of foodservice operations would be necessary to confirm this hypothesis. Yet if it is true that there is no relationship between supporting employees and financial status one year into the pandemic, this would mean that businesses were not harmed by offering employees resources and support in unstable times. The literature needs not only larger samples of foodservice businesses, but also studies of their employees, who experienced rocky employment in high-contact jobs. Research is also needed on the experiences of hired farmworkers during the pandemic, which we do not address in this study.

Implications

Out of the many hypothesized indicators of resilience in our conceptual model, the only factor with a significant relationship to financial status one year into the pandemic was financial status before the pandemic. In the end, most businesses stood about where they started. And out of the 125 operations that reported their financial status since COVID-19, only 13, or just over 10%, were vulnerable. If the most (or only) significant factor in business resilience is the health of the business before a shock, then the most effective policies to encourage business resilience would focus not on crisis response but on fostering an economy in which small businesses can do well in normal times. For the local food businesses in our sample, Vermont seems to have been largely successful in that regard. But there is still room for improvement. Well over half (n=67) of the 109 farms that reported their pre-COVID financial status were merely sustainable before the pandemic, meaning that their farm was able to keep going thanks to either built equity or off-farm income. Future research and policy efforts should focus on developing policies, markets, and strategies to help small farms become viable businesses that can cover costs, pay family labor, and generate a profit.

Although we did not find that any of the adaptations businesses or government made in response to the pandemic helped the businesses in our sam-

ple, they also did no harm. Managers and owners who exercised their creativity, shifting markets and doing what they could to help employees, did so at no detriment to the business. Although we did not find the receipt of government funding to be a significant factor in financial status since the pandemic, the responses of foodservice businesses suggest that in some cases emergency funds were key to business survival. Further research with a larger sample of foodservice businesses, including those that did not receive funding, is needed to investigate the impact of government assistance on this sector.

The significant relationship between financial status before the pandemic and receiving funding after its onset also merits further investigation. What made emergency funds more accessible to thriving businesses, and less so to businesses that were struggling for viability? Did small farms encounter bureaucratic obstacles that hampered their ability to apply for emergency funds in the first place? Since many funds were loans, did funders privilege applicants they deemed more likely to repay on schedule based on prior financial track records? How might government assistance, both emergency and otherwise, exercise fiscal caution while ensuring funds are directed where they are needed most?

Conclusion

We investigated many possible contributors to the financial status of the businesses in our sample one year into the pandemic, but the only significant factor we identified was financial status before the pandemic. Out of the 120 businesses that responded to both financial status questions, 85, or 71%, reported the same status for both time periods. These results suggest that the most effective local food system resilience policy is not a disaster response plan but a long-term strategy for strengthening local food economies. While the foodservice businesses in our sample were hit harder by the pandemic, most of the farms relied on built equity or off-farm income even before COVID-19. Future research and policy should identify and activate strategies for helping direct sales farms become viable businesses.

The farms and foodservice operations in our sample made many adaptations in response to the COVID-19 pandemic. While we did not find that making adaptations improved financial status, we also did not find any negative association. These local food businesses made adjustments to stay open, to support employees, and to provide food for Vermonters, and they did not suffer for it.

We found no significant relationship between receiving funding and financial status since COVID-19, but businesses doing well before the pandemic were more likely to be funded once it hit. The relationship between business performance and federal, state, and private funding requires additional research. What barriers did businesses encounter applying to and receiving emergency funds? What was the impact of funding on foodservice alone? Did funds not sufficiently address COVID-19 disruptions, and/or did funding not continue for long enough, given the pandemic's length?

This study relied on a simple four-level measure of financial wellbeing. We chose this measure because it offers a picture of business status without much burden to the research participant. While we believe metrics like these to be most practical for survey research, they are of course simplified and subjective. Future studies may explore different survey-appropriate measures of fiscal health. They may also dive into financial specifics through macro-analyses of secondary data or offer appropriate benefits and/or compensation to research participants for taking part in in-depth explorations of individual business financials.

This study's greatest limitation was sample size and survey response, especially for the foodservice survey. Our survey response was limited both by the particular challenges of spring 2021 and the regular demands of foodservice business. The foodservice study also focused on operations engaged in local and regional food networks through their purchases and their involvement in the Vermont Fresh Network, which yielded 22 out of our 25 responses. For the most part, this list does not include Vermont's many restaurants owned and operated by immigrants, which may have faced different challenges meriting a separate investigation. An unsolved and perhaps unsolvable question is: how can researchers responsively and

productively study industries, like foodservice and farming, with busy workloads that happen away from a desk? How can we make research a useful exercise for both us and our research participants? How can we include restaurateurs and farmers who may not have the time to talk with us because their businesses are struggling? Barriers to building resilience capacity may also be barriers to research participation. Efforts at reducing this bias may require significant resource investment but will yield more complete results and help construct a more resilient food system. 

References

Agency of Agriculture, Food and Markets. (n.d.). *Vermont COVID-19 agriculture assistance program*. Retrieved June 1, 2022, from https://agriculture.vermont.gov/covid-19-information/vermont-covid-19-agriculture-assistance-program

Agency of Commerce and Community Development. (n.d.). *Vermont emergency economic recovery grants*. Retrieved from https://web.archive.org/web/20220518152059/https://accd.vermont.gov/covid-19/economic-recovery-grants

An act relating to equitable access to a high-quality education through community schools, H.106 (Act 67), Vermont State Legislature, 2021 (2021). https://legislature.vermont.gov/bill/status/2022/H.106

Baum, S. D., Denkenberger, D. C., Pearce, J. M., Robock, A., & Winkler, R. (2015). Resilience to global food supply catastrophes. *Environment Systems and Decisions*, *35*, 301–313. https://doi.org/10.1007/s10669-015-9549-2

Behzadi, G., O'Sullivan, M. J., Olsen, T. L., Scrimgeour, F., & Zhang, A. (2017). Robust and resilient strategies for managing supply disruptions in an agribusiness supply chain. *International Journal of Production Economics*, *191*, 207–220. https://doi.org/10.1016/j.ijpe.2017.06.018

Béné, C. (2020). Resilience of local food systems and links to food security – A review of some important concepts in the context of COVID-19 and other shocks. *Food Security*, *12*, 805–822. https://doi.org/10.1007/s12571-020-01076-1

Béné, C., & Doyen, L. (2018). From resistance to transformation: A generic metric of resilience through viability. *Earth's Future*, *6*(7), 979–996. https://doi.org/10.1002/2017EF000660

Bianchi, S., Ghosh, A., Ripley, F., Ruggiero, L. R., & Cho, Y. (2020). *Vermont Everyone Eats formative evaluation: Community hub and restaurant experience*. Southeastern Vermont Community Action. https://img1.wsimg.com/blobby/go/a925333d-65bb-4391-b6e8-b1c6258363bc/downloads/VEE%20Final%20Report%201.15.21%20(1).pdf

Borges-Méndez, R., & Caron, C. (2019). Decolonizing resilience: The case of reconstructing the coffee region of Puerto Rico after Hurricanes Irma and Maria. *Journal of Extreme Events*, *6*(1), Article 1940001. https://doi.org/10.1142/S2345737619400013

Boyacı-Gündüz, C. P., Ibrahim, S. A., Wei, O. C., & Galanakis, C. M. (2021). Transformation of the food sector: Security and resilience during the COVID-19 pandemic. *Foods*, *10*(3), Article 497. https://doi.org/10.3390/foods10030497

Brizek, M. G., Frash, R. E., McLeod, B. M., & Patience, M. O. (2021). Independent restaurant operator perspectives in the wake of the COVID-19 pandemic. *International Journal of Hospitality Management*, *93*, Article 102766. https://doi.org/10.1016/j.ijhm.2020.102766

Connolly, K., Babbin, M. I., McKee, S. L., McGinn, K., Cohen, J. F. W., Chafouleas, S. M., & Schwartz, M. B. (2021). Dedication, innovation, and collaboration: A mixed-methods analysis of school meals in Connecticut during COVID-19. *Journal of Agriculture, Food Systems, and Community Development*, *10*(2), 11–27. https://doi.org/10.5304/jafscd.2021.102.020

Deliso, M. (2020, September 17). *How Vermont became a "model for the country" in responding to the coronavirus pandemic.* ABC News. https://abcnews.go.com/US/vermont-model-country-responding-coronavirus-pandemic/story?id=73057030

Demko, I., Sant'Anna, A. C., & Liang, K. (2021). An overview of the Paycheck Protection Program (PPP) loans and implications for agricultural enterprise recovery from COVID. *Journal of Agriculture, Food Systems, and Community Development*, *11*(1), 201–208. https://doi.org/10.5304/jafscd.2021.111.003

Duarte Alonso, A., Kok, S. K., Bressan, A., O'Shea, M., Sakellarios, N., Koresis, A., Buitrago Solis, M. A., & Santoni, L. J. (2020). COVID-19, aftermath, impacts, and hospitality firms: An international perspective. *International Journal of Hospitality Management*, *91*, Article 102654. https://doi.org/10.1016/j.ijhm.2020.102654

Duffort, L., & Petenko, E. (2021, March 24). *As state loosens restrictions on bars and restaurants, workers feel at risk*. VTDigger. https://vtdigger.org/2021/03/24/as-state-loosens-restrictions-on-bars-and-restaurants-workers-feel-at-risk/

Ericksen, P. J. (2008). What is the vulnerability of a food system to global environmental change? *Ecology and Society*, *13*(2), 14–31. https://doi.org/10.5751/ES-02475-130214

Farrer, J. (2020). How are Tokyo's independent restauranteurs surviving the pandemic? *Asia-Pacific Journal*, *18*(18), Article 5483. https://apjjf.org/2020/18/Farrer.html

Food and Agriculture Organization of the United Nations [FAO]. (2013). *Resilient livelihoods: Disaster risk reduction for food and nutrition security*. https://www.fao.org/3/i3270e/i3270e.pdf

Gkoumas, A. (2021). Developing an indicative model for preserving restaurant viability during the COVID-19 crisis. *Tourism and Hospitality Research*, *22*(1), 1–14. https://doi.org/10.1177/1467358421998057

Joseph, J. (2013). Resilience as embedded neoliberalism: A governmentality approach. *Resilience*, *1*(1), 38–52. https://doi.org/10.1080/21693293.2013.765741

Madeira, A., Palrão, T., & Mendes, A. S. (2021). The impact of pandemic crisis on the restaurant business. *Sustainability*, *13*(1), 40. https://doi.org/10.3390/su13010040

Magis, K. (2010). Community resilience: An indicator of social sustainability. *Society & Natural Resources*, *23*(5), 401–416. https://doi.org/10.1080/08941920903305674

Mastronardi, L., Cavallo, A., & Romagnoli, L. (2021). How did Italian diversified farms tackle Covid-19 pandemic first wave challenges? *Socio-Economic Planning Sciences*, *82*(A), Article 101096. https://doi.org/10.1016/j.seps.2021.101096

Neise, T., Verfürth, P., & Franz, M. (2021). Rapid responding to the COVID-19 crisis: Assessing the resilience in the German restaurant and bar industry. *International Journal of Hospitality Management*, *96*, Article 102960. https://doi.org/10.1016/j.ijhm.2021.102960

Nemes, G., Chiffoleau, Y., Zollet, S., Collison, M., Benedek, Z., Colantuono, F., Dulsrud, A., Fiore, M., Holtkamp, C., Kim, T.-Y., Korzun, M., Mesa-Manzano, R., Reckinger, R., Ruiz-Martínez, I., Smith, K., Tamura, N., Viteri, M. L., & Orbán, É. (2021). The impact of COVID-19 on alternative and local food systems and the potential for the sustainability transition: Insights from 13 countries. *Sustainable Production and Consumption*, *28*, 591–599. https://doi.org/10.1016/j.spc.2021.06.022

O'Hara, J. K., Woods, T. A., Dutton, N., & Stavely, N. (2021). COVID-19's impact on farmers market sales in the Washington, D.C., area. *Journal of Agricultural and Applied Economics*, *53*(1), 94–109. https://doi.org/10.1017/aae.2020.37

Perrin, A., & Martin, G. (2021). Resilience of French organic dairy cattle farms and supply chains to the Covid-19 pandemic. *Agricultural Systems*, *190*, 103082. https://doi.org/10.1016/j.agsy.2021.103082

Schipanski, M. E., MacDonald, G. K., Rosenzweig, S., Chappell, M. J., Bennett, E. M., Kerr, R. B., Blesh, J., Crews, T., Drinkwater, L., Lundgren, J. G., & Schnarr, C. (2016). Realizing resilient food systems. *BioScience*, *66*(7), 600–610. https://doi.org/10.1093/biosci/biw052

Tendall, D. M., Joerin, J., Kopainsky, B., Edwards, P., Shreck, A., Le, Q. B., Kruetli, P., Grant, M., & Six, J. (2015). Food system resilience: Defining the concept. *Global Food Security*, *6*, 17–23. https://doi.org/10.1016/j.gfs.2015.08.001

Thilmany, D., Canales, E., Low, S. A., & Boys, K. (2020). Local food supply chain dynamics and resilience during Covid-19. *Applied Economic Perspectives and Policy*, *43(*1), 86–104. https://doi.org/10.1002/aepp.13121

Tittonell, P., Fernandez, M., El Mujtar, V. E., Preiss, P. V., Sarapura, S., Laborda, L., Mendonça, M. A., Alvarez, V. E., Fernandes, G. B., Petersen, P., & Cardoso, I. M. (2021). Emerging responses to the COVID-19 crisis from family farming and the agroecology movement in Latin America – A rediscovery of food, farmers and collective action. *Agricultural Systems*, *190*, Article 103098. https://doi.org/10.1016/j.agsy.2021.103098

Toth, A., Rendall, S., & Reitsma, F. (2016). Resilient food systems: A qualitative tool for measuring food resilience. *Urban Ecosystems*, *19*, 19–43. https://doi.org/10.1007/s11252-015-0489-x

Worstell, J., & Green, J. (2017). Eight qualities of resilient food systems: Toward a sustainability/resilience index. *Journal of Agriculture, Food Systems, and Community Development*, *7*(3), 23–41. https://doi.org/10.5304/jafscd.2017.073.001