

## Local food system vitality in the Southern U.S.: A resident perspective

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Submitted April 11, 2025 / Revised August 3, 2025 / Accepted September 11, 2025 /  
Published online November 20, 2025

Citation: Varziri, A., Woods, T. A., Rossi, J., & Zhao, S. (2025). Local food system vitality in the Southern U.S.: A resident perspective. *Journal of Agriculture, Food Systems, and Community Development*, 15(1), 191–213. <https://doi.org/10.5304/jafscd.2025.151.008>

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### Abstract

Local food systems (LFSs) are increasingly recognized for their potential to address food access, economic development, and environmental sustainability, yet their performance varies significantly

across communities. Using the structure-conduct-performance (SCP) framework, this study assesses LFS vitality (LFSV), a measure developed and validated by our research group in Southern U.S. communities through consumer perceptions. The LFSV survey evaluates resident views across 25 components in four categories: food market channels, local product traits, community engagement, and organizational support. Principal component analysis (PCA) and regression analysis reveal distinct consumer priorities: smaller communities value equitable access, direct-to-consumer markets, and community engagement, while larger communities prioritize product quality, convenience, and retail market accessibility. A follow-up survey

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### Funding Disclosure

Funding for this research was provided through the Measuring and Building on Local Food System Vitality for Communities in the South, supported by U.S. Department of Agriculture, National Institute of Food and Agriculture (NIFA) grant no. 2018-68006-27644.

### Declarations of Interest

None

shows increased consumer preference for retail markets and quality assurance. These findings highlight the need for tailored strategies, including infrastructure improvements, government backing, and community engagement aligned with consumer values.

### Keywords

local food systems, resident perceptions, consumer values, community engagement, marketing strategy, principal component analysis

### Introduction and Background

The growing demand for locally sourced foods has positioned LFSs as an integral part of the United States agriculture, capturing significant attention from consumers and policymakers alike (Low et al., 2015). Given that consumers increasingly prioritize transparency regarding their food's origin, including information on producers, production methods, and geographic sources, approximately half of U.S. consumers express strong preferences for purchasing local foods (Tropp & Moraghan, 2017).

The definitions of "local" vary widely, extending from city-level to regional or state boundaries depending on product type (NielsenIQ, 2019). While the general concept of "local food" usually refers to products that are produced, processed, and distributed entirely in a specific region, definitions vary considerably, influenced by regional contexts, farmer capabilities, and geographical characteristics (Cranfield et al., 2012; Ilbery & Maye, 2006; McCaffrey & Kurland, 2014; McFadden, 2015). Definitions may prioritize geographic proximity (Adams & Adams, 2011; Martinez et al., 2010; Onozaka et al., 2010; Selfa & Qazi, 2005) or incorporate political, social, economic, and environmental dimensions (Zepeda & Leviten-Reid, 2004). Population density also plays a role, as rural and urban communities often adopt differing standards for what constitutes "local" (Martinez et al., 2010). This diversity in definitions underscores both the adaptability and complexity of LFSs, necessitating tailored approaches for their effective development. Such preferences reflect broader consumer values associating local food systems with sustainability, health benefits, economic vital-

ity, and resilience (Rossi et al., 2017; Telligman et al., 2017).

LFSs are particularly important in supporting small and medium-sized farms, common throughout the Southern U.S., by providing essential markets that sustain their operations, support economic viability, and help preserve their independence in the face of increasing industry consolidation. Community engagement with LFSs is often motivated by concerns over transparency and sustainability issues inherent in conventional agriculture (Feldmann & Hamm, 2015). The importance of these systems became particularly evident during the COVID-19 pandemic, as demonstrated by their resilience and adaptability, such as a South Carolina (SC) food hub effectively redistributing surplus food to community members facing supply disruptions (Nemes et al., 2021; South Carolina Department of Agriculture, 2021).

Despite the growing emphasis on LFSs, there remains limited research exploring how residents, particularly in the Southern U.S., perceive the strengths and weaknesses of these systems. Understanding these perceptions is essential for identifying targeted opportunities for growth and informing strategies explicitly tailored to regional needs, particularly in communities where agriculture significantly shapes economic and cultural identity. Therefore, this study aims to: (1) measure resident perceptions of how different LFS attributes are performing, (2) identify priority areas for improvement based on community feedback, and (3) explore differences in perceptions across different community sizes and demographic groups. Ultimately, findings from this study will help coordinators, policymakers, and local growers align food system operations with resident expectations, close gaps between current performance and potential impact, and foster resilient, community-supported local food systems across the Southern U.S. The region is characterized by numerous small and midsized farms, diverse agricultural practices, and lower-than-average household incomes (Farrigan, 2021; U.S. Department of Agriculture, Economic Research Service [USDA ERS], 2023; Williamson, 2014). Culturally, traditions of community engagement, direct-market agriculture (e.g., farmers markets, roadside stands), and local food

heritage shape consumer preferences and food system structures. Persistent food insecurity and structural inequities have also contributed to distinct patterns of food access and community-driven responses (Feeding America, 2025).

## Literature Review

A significant body of research explores consumer motivations for engaging with LFSs, driven by demand for products with specific credence attributes such as healthfulness, environmental responsibility, and support for local agriculture. These attributes are difficult for consumers to verify on their own, even after purchase, and typically require information from third-party certification or trusted experts (Feldmann & Hamm, 2015; Onozaka et al., 2010; Thilmany et al., 2008; Zepeda & Deal, 2009). Consumers commonly perceive local products as fresher, tastier, and nutritionally superior (Miroso & Lawson, 2012; Roininen et al., 2006), and are often willing to pay premium prices, linking their purchases to community support and local economic benefits (Lang et al., 2014). Factors such as income, nutritional awareness, and health consciousness significantly shape consumer choices (Kumar & Smith, 2018; Nie & Zepeda, 2011; Thilmany et al., 2006), providing essential insights for evaluating resident perceptions of LFS.

The economic impacts of LFSs significantly benefit rural and urban communities by providing market opportunities for small and medium-sized farms. Typically, local farmers engage in shorter, more direct supply chains involving multiple community stakeholders, thereby enhancing local economic circulation compared to conventional food systems (Budge et al., 2010). Entrepreneurial LFSs create valuable direct channels connecting producers with consumers, increasing producers' market shares and ensuring consumer access to quality products (Sitaker et al., 2014). LFSs also promote community economic development through strengthened social capital and producer-consumer networks (Christensen & Phillips, 2016). USDA data indicate that local food sales generated US\$9.0 billion in 2020, with institutional and intermediary sales representing the largest share (US\$4.1 billion), followed by direct-to-consumer (US\$2.9 billion) and direct-to-retail channels (US\$1.9 billion)

(USDA National Agricultural Statistics Service [NASS], 2022). The contribution and distribution of these sales varied significantly by region (USDA NASS, 2022).

Beyond economic benefits, LFSs enhance community resilience, especially during crises. For instance, following a natural disaster in Christchurch, New Zealand, LFSs substantially rebuilt community resilience by strengthening social, human, natural, and physical capital (Berno, 2017). During the COVID-19 pandemic, LFSs significantly enhanced local food security and community stability (Béné, 2020). LFSs build stronger social connections and community networks, essential for managing disruptions (McDaniel et al., 2021) and empower communities by increasing local control over food resources (Toth et al., 2016).

Effective distribution and marketing channels are pivotal to sustaining and expanding LFSs. Channels like farmers markets, community supported agriculture (CSA) operations, retail stores, and institutional sales uniquely support growth, shaped by local demographics and consumer preferences (Martinez, 2021). Retail markets expand consumer access to local products and reinforce producer-consumer networks (Trivette, 2019). Collaborations enhance farmers' markets' effectiveness in achieving environmental, social, and economic goals (Wittman et al., 2012), with transparent markets being especially popular in urban areas (Gillespie et al., 2007).

## Materials and Methods

This section outlines the survey procedures, data analysis techniques, and statistical models, including principal component analysis (PCA) and ordered logit regression, used to assess LFS performance across selected Southern U.S. communities. The analysis is grounded in the structure-conduct-performance (SCP) framework, which theorizes how the underlying structure of a system (such as market channels, organizational support, and coordination mechanisms) influences the conduct (behaviors and interactions) of market actors, which in turn affects overall system performance and outcomes (Henderson, 1988; Marion, 1976). To operationalize this framework, we employed

the LFSV<sup>1</sup> survey, a composite measure capturing resident perceptions of key attributes in their LFS.

**Data Collection**

Surveys were conducted in 2018 and 2019 via mail and online methods to evaluate perceptions of LFS performance in 15 Southern U.S. communities, categorized by population size into nonmetro/smaller (≤ 500,000) and metro/larger communities (> 500,000), as detailed in Table 1. Respondents were asked to evaluate the current performance of 25 LFS attributes in their community. Using a 5-point Likert scale ranging from “Extremely Poor (1)” to “Excellent (5),” they rated how well each attribute was functioning in their community at the time of the survey. An additional “do not know” option was provided for respondents unfamiliar with particular attributes. Attributes were organized into four domains, including food market channels, local product characteristics, community engagement, and organizational support, aligning with the SCP framework’s emphasis on structural and organizational dimensions.

In this study, “performance” reflects residents’

perceptions of how effectively different aspects of the LFS operate in their communities. For food market channels, strong performance means that markets offer diverse, high-quality local products and are accessible to community members. Local product characteristics are considered high-performing when residents can easily identify and access a wide variety of local foods. For community engagement, high performance is defined by the availability of food-related resources for those who need or want them, and by the extent to which food activities foster a sense of place, inclusiveness, and community identity, while also ensuring that resources and activities are adequate, high-quality, and healthy. Organizational support performance reflects the extent to which local food activities are promoted and supported by government, businesses, and community organizations, and are visible in local media. Collectively, these domains provide a comprehensive measure of how well the LFS meets the needs and expectations of residents.

To capture evolving trends and priorities in LFSs, a follow-up survey was conducted in 2022 using the same instrument and methodology as the initial 2018–2019 survey. This follow-up assessment focused on a subset of the original communities, including smaller areas (Upstate SC and Knoxville, Tennessee [TN]) and larger metro regions (Nashville, TN; Louisville, Kentucky [KY]; and Raleigh-Durham-Chapel Hill, North Carolina [NC]). This longitudinal approach enabled direct comparison of results across two time periods providing insights into both

**Table 1. Communities Surveyed in 2018–2019, Defined by Population Size**

Nonmetro/Smaller Metro Communities (Population ≤ 500,000)	Metro/Larger Communities (Population > 500,000)
Upstate SC	Nashville, TN
Catawba, SC	Louisville, KY
Edgecombe County, NC	Raleigh-Durham-Chapel Hill, NC
Little Rock, AR	Columbia, SC
Knoxville, TN	Baton Rouge, LA
Montgomery, AL	
Boyd County, KY	
Clark County, KY	

Note: State abbreviations follow U.S. Postal Service standards: Alabama (AL), Arkansas (AR), Kentucky (KY), Louisiana (LA), North Carolina (NC), South Carolina (SC), Tennessee (TN).

<sup>1</sup> The initial development of the survey followed a multistep process to ensure that the instrument captured meaningful and relevant attributes of local food system vitality. Input was first obtained from focus groups, including young professionals interested in local foods and general consumers, to identify the attributes and values associated with “local food,” as well as factors shaping participation and perceptions. Based on these insights, a draft survey was created and subsequently reviewed by local food experts, advocates, and USDA Agriculture Marketing Service (AMS) colleagues to enhance clarity and comprehensiveness. The survey instrument was then pilot-tested in Lexington, Kentucky, after which further refinements were made in collaboration with research teams from North Carolina State University, Clemson University, and Arkansas State University. Through this collaborative and iterative process, the instrument was validated and adapted for broader regional contexts. Throughout development, the same core domains and items as the original LFSV index, food marketing channels, product characteristics, community engagement, and organizational support were retained, enabling consistent comparison of resident perceptions across different communities and time periods.

persistent and emerging shifts in resident perceptions and LFS priorities. Online surveys were administered through Qualtrics (versions 2018–2022) and distributed via Dynata (Dynata, 2018–2022), a global data and insights company providing verified online survey panels. Approval from the University of Kentucky Institutional Review Board (IRB) was obtained prior to implementation (IRB no. 46354).

### *Data Analysis*

We calculated mean performance scores for each of the 25 LFS components and compared these scores between smaller and larger communities using two-tailed t-tests. Responses marked “do not know” were excluded to ensure analyses reflected informed evaluations. This comparison identified significant differences in resident perceptions, revealing community-specific strengths and weaknesses and informing targeted strategies for LFS improvement (Goodwin, 2013; Palma et al., 2013).

### *Principal Component Analysis (PCA)*

Given a wide range of LFS attributes, we needed a way to simplify and organize this information. PCA is a multivariate statistical method used to reduce the dimensionality of correlated survey items into a smaller set of latent constructs, or principal components. These components represent uncorrelated dimensions that capture the underlying structure of respondents’ perceptions of their LFS.<sup>2</sup>

### *Ordered Logit Regression*

We used ordered logit regression to evaluate the relationship between new principal components (PC) and the overall vitality of LFSs in both large and small communities. The ordered logit regression appropriately accommodates the ordinal nature of Likert-scale data, accounting for the hierarchical order without requiring equal distances between response categories (Greene, 2008; Long, 1997). The regression included demographic variables such as gender, age, income, years of residency, homeownership status, and level of interest

in local food. This approach enabled us to identify key factors influencing community perceptions of LFSV across diverse settings.

## **Results**

The following section presents key findings from the 2018–2019 survey and the follow-up 2022 survey, organized by thematic focus. Results are grouped to highlight variations across community sizes in resident awareness, perceived performance, and key drivers of LFSV.

### *Residents’ Awareness of LFS Components*

Residents’ awareness of LFS components varies across community sizes, likely reflecting differences in local development strategies and component visibility. Respondents who rated a component from “extremely poor” to “excellent” were considered aware (coded as one), while “do not know” responses indicated a lack of awareness (coded as zero; Table 2). Farmers markets were the most recognized direct marketing channel, with similarly high awareness levels in both smaller (88.77%) and larger (89.28%) communities. Grocery stores and restaurants also had very high awareness, exceeding 96% in both community types. CSAs were the least recognized channel, with awareness of just over half in smaller ( $\approx 56\%$ ) and larger (55.46%) communities. Smaller communities demonstrated lower awareness of niche channels such as food trucks ( $\approx 68\%$ ) and microbreweries, distilleries, or wineries (64.33%) compared to larger communities (75.40% and 70.67%, respectively).

Table 3 summarizes the demographic characteristics of respondents who were aware of all 25 LFS components. Respondents in both smaller and larger communities were predominantly female (63.48% and 64.11%, respectively) with similar average ages of around 43–44 years. However, notable differences emerged in income levels. Residents in larger communities reported a higher average income (US\$82,448) compared to smaller communities (US\$74,486), with fewer respondents in larger communities earning under

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<sup>2</sup> We retained principal components (PCs) with eigenvalues greater than one, following the Kaiser criterion (Jolliffe, 2002; Kaiser, 1960). To improve interpretability, varimax rotation was applied, and a loading threshold of 0.2 was used to determine meaningful component-item associations (Richman, 1994; Richman & Lamb, 1985).

**Table 2. Awareness of Local Food Systems (LFS) Components in Different Communities (2018–2019)**

LFS Component Category	LFS Components	Smaller communities (N = 1,746)	Larger communities (N = 2,379)
Food Marketing Channels	Farmers markets	88.77%	89.28%
	Cooperative food stores/specialty stores/health food stores	78.89%	77.88%
	Grocery stores	98.44%	98.18%
	Restaurants	96.70%	96.90%
	Community supported agriculture (CSA)	55.95%	55.46%
	Food trucks	68.03%	75.40%
	Roadside markets or stands	79.58%	77.03%
	Microbreweries, distilleries, and/or wineries	64.33%	70.67%
Local Product Characteristics	Institutions (hospitals, workplaces, state parks, etc.)	80.67%	82.92%
	Product diversity	87.13%	89.46%
	Identifiable farm brands	76.53%	79.41%
	Competitive product price	88.16%	90.42%
	Local food labels	81.18%	84.07%
	State branding programs	75.78%	80.95%
	Local product quality	89.53%	91.27%
Community Engagement	Healthy local food options	87.77%	90.49%
	Fresh food in low-income neighborhoods	68.38%	67.35%
	Cooking, food preservation, and consumer education programs	73.29%	72.06%
	Home and community gardens	78.31%	76.32%
	Food festivals	86.71%	86.50%
	Food banks/food pantries	83.28%	81.95%
Organizational Support	On-farm events	69.60%	71.01%
	Local government investment in local food programs	64.43%	69.77%
	Public market buildings and facilities	77.42%	77.50%
	Media coverage of local food events, products, and programs	85.30%	87.08%

**Table 3. Demographic Profile of Respondents (2018–2019)**

Demographic Variables	Smaller Communities (N = 356)	Larger Communities (N = 574)
Age (Year)	44.10	43.05
Gender		
Female	63.48%	64.11%
Male	36.52%	35.89%
Income (in US\$)	74,486	82,448
Under \$50K	41.57%	35.19%
\$50–\$99K	32.02%	35.54%
\$100–\$149K	17.98%	16.03%
\$150–\$199K	4.49%	8.71%
Over \$200K	3.93%	4.53%
Years of residence (Year)	17.46	16.73
Homeownership status		
Homeowner	73.60%	70.21%
Renter	26.40%	29.79%
Local Food Interest Level		
Low interest in consuming local food	52.53%	68.12%
High interest in consuming local food	47.47%	31.88%

US\$50,000 annually (35.19%) compared to smaller communities (41.57%). Residents in smaller communities reported slightly longer average residence durations (17.46 years) compared to larger communities (16.73 years) and had slightly higher homeownership rates (73.60% vs. 70.21%). Notably, despite having lower average incomes, smaller community respondents indicated significantly higher interest in consuming local food (47.47%) compared to residents in larger communities (31.88%).

**Comparison of Mean Performance of LFS Components**

Table 4 presents mean performance scores of LFS components by community size, based on the Likert scale “extremely poor (1)” to “excellent (5),” where “3” indicates average performance. Larger communities consistently rated LFS components higher than smaller communities, suggesting better perceived performance across most attributes.

In terms of food marketing channels, grocery

stores and restaurants received significantly higher ratings in larger communities (means of 4.00 and 4.01, respectively) compared to smaller communities (3.81 and 3.68, respectively). Similarly, niche marketing channels like microbreweries, distilleries, wineries, institutions, cooperative food stores, and food trucks showed significantly higher scores in larger communities. Regarding local product characteristics, residents in both community types rated product quality highest,

**Table 4. Mean Performance of Local Food Systems (LFS) Components for Different Communities (2018–2019)**

LFS Component Category	LFS Components	Smaller Communities (N = 356)	Larger Communities (N = 574)
		Mean	Mean
Food Marketing Channels	Restaurants	3.68	4.01***
	Grocery stores	3.81	4.00***
	Farmers markets	3.67	3.77
	Institutions (hospitals, workplaces, state parks, etc.)	3.34	3.66***
	Microbreweries, distilleries, and/or wineries	3.33	3.62***
	Cooperative food stores/specialty stores/health food stores	3.26	3.50***
	Food trucks	3.14	3.47***
	Community supported agriculture (CSA)	3.20	3.29
	Roadside markets or stands	3.08	3.13
Local Product Characteristics	Local product quality	3.66	3.84***
	Healthy local food options	3.35	3.68***
	State branding programs	3.32	3.57***
	Competitive product price	3.30	3.51***
	Product diversity	3.29	3.58***
	Local food labels	3.21	3.51***
	Identifiable farm brands	3.18	3.44***
Community Engagement	Food banks/food pantries	3.35	3.49*
	Food festivals	3.28	3.61***
	Home and community gardens	3.09	3.28**
	On-farm events	3.02	3.22**
	Cooking, food preservation, and consumer education programs	2.95	3.21***
	Fresh food in low-income neighborhoods	2.69	2.92***
Organizational Support	Media coverage of local food events, products, and programs	3.12	3.34***
	Public market buildings and facilities	3.08	3.30***
	Local government investment in local food programs	2.86	3.11***
	Overall vitality	3.23	3.50***

Note: To avoid visual overload, significance markers are shown only on the mean performance of large communities, indicating a meaningful difference between community sizes.\*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10%. Within each category, LFS components are listed in order from highest to lowest mean performance according to responses from smaller communities.

although significantly higher in larger communities (3.84 vs. 3.66). Components such as healthy local food options, state branding programs, product diversity, competitive pricing, local food labels, and identifiable farm brands also received significantly higher scores from residents in larger communities, highlighting stronger performance across multiple attributes. Community engagement attributes revealed lower ratings for accessibility of fresh food in low-income neighborhoods in both smaller (2.69) and larger communities (2.92), emphasizing ongoing challenges. Components such as food festivals, cooking and consumer education programs, food banks, home/community gardens, and on-farm events also had significantly higher performance scores in larger communities. Organizational support components, including media coverage, public market facilities, and local government investment, received comparatively lower scores overall but were still significantly higher in larger communities. Specifically, local government investment scored lowest in both community types but showed marked differences (3.11 larger vs. 2.86 smaller communities). Finally, the overall vitality ratings of LFSs revealed significantly higher performance scores in larger communities (mean of 3.50) compared to smaller communities (mean of 3.23). This suggests a clear relationship between community size, resource availability, and perceived LFSV.

### *PCA Results for Different Communities*

PCA was conducted separately for smaller (Table 5) and larger (Table 6) communities to identify underlying groupings and priorities among LFS components. In smaller communities, PCA identified three PCs. PC1 (Food Accessibility and Government Support) captured the greatest variance, emphasizing variables such as fresh food availability in low-income neighborhoods, local government investment, home/community gardens, cooking and education programs, and media coverage. PC2 (Direct Marketing and Product Characteristics) grouped direct consumer channels and specialized product attributes, including cooperatives, food trucks, microbreweries, wineries, and farmers markets. PC3 (Retail Markets) encompasses traditional retail channels like grocery stores, restau-

rants, and institutions, capturing the least variance among the three PCs.

For larger communities, PCA resulted in four PCs. PC1 (Food Accessibility and Government Support) also dominated in larger communities, highlighting fresh food access, home gardens, educational programs, food banks, and local government support. PC2 (Local Food Quality and Diversity) emphasized local product quality, diversity, branding, labeling, and competitive pricing. PC3 (Direct Marketing Channels) consisted of direct-to-consumer channels such as farmers markets, CSAs, roadside stands, and niche outlets like food trucks. PC4 (Retail Markets) included grocery stores, restaurants, and institutions, representing conventional retail food sources with the least variance explained.

### *Ordered Logit Regression for Large and Smaller Communities*

To further assess which LFS components drive overall system vitality, we evaluated the significance of these new PCs and demographic variables on LFSV through two separate ordered logit regressions for large and small communities.

The ordered logit regression analysis identified PC1 (Food Access and Government Support) as having the strongest positive influence on perceived LFSV in smaller communities (Table 7), explaining approximately 27% of the variance (coefficient = 0.81,  $p < 0.01$ ). PC2 (Direct Market Channels and Product Quality) was also significantly associated with LFSV, though less influential, accounting for about 6% of the variance (coefficient = 0.44,  $p < 0.01$ ). Conversely, PC3 (Retail Markets) showed no significant relationship. Demographic variables, including age, gender, income, homeownership status, years of residency, and local food interest, had no significant impact on the perceived vitality of LFS in smaller communities.

In larger communities (Table 8), the regression results showed PC1 (Food Access and Government Support) had the greatest impact, accounting for 20% of the variance in perceived vitality (coefficient = 0.65,  $p < 0.01$ ). PC2 (Product Quality) was also highly significant, explaining an additional 8% of variance (coefficient = 0.50,  $p < 0.01$ ). PC4

(Retail Markets) was significant but less influential, contributing to only 1% of the variance (coefficient = 0.19,  $p < 0.05$ ), whereas PC3 (Direct Market Channels) did not show a significant relationship with overall vitality. Among demographic variables, gender was the only factor significantly influencing perceptions in larger communities, with men rating LFSV slightly higher than women (coefficient = 0.35,  $p < 0.10$ ), explaining approximately 1% of variance. Other demographics showed no significant effects.

### *Follow-Up Survey Results (2022 Subset)*

Having presented the results from the initial 2018–2019 survey of all 15 communities, we now turn to the follow-up assessment conducted in 2022 with a

subset of these communities (specifically, Upstate SC and Knoxville, TN, as smaller areas, and Nashville, TN; Louisville, KY; and Raleigh-Durham-Chapel Hill, NC, as larger metro regions). The findings below are restricted to this subset, allowing for longitudinal comparison of key drivers of LFSV. Detailed demographic characteristics, component awareness, and mean performance scores for the follow-up survey are presented in Appendix Tables A1–3. In the following section, we focus on the results of the PCA and ordered logit regression analyses, which assess the key factors associated with perceived LFSV across time periods and community types.

As shown in Table 9, principal component analysis for the 2022 subset of smaller communities

**Table 5. Principal Component Analysis for Smaller Communities (2018–2019)**

Local Food Systems (LFS)					
Component Category	LFS Components	PC1	PC2	PC3	Unexplained
Food Marketing Channels	Farmers markets		0.28		0.42
	Cooperative food stores/specialty stores/health food stores		0.37		0.37
	Grocery stores			0.49	0.33
	Restaurants			0.60	0.22
	Community supported agriculture (CSA)			0.20	0.37
	Food trucks			0.37	0.40
	Roadside markets or stands			0.27	0.43
	Microbreweries, distilleries, and/or wineries			0.40	0.41
	Institutions (hospitals, workplaces, state parks, etc.)			0.50	0.35
	Local Product Characteristics	Product diversity			
Identifiable farm brands			0.24		0.30
Competitive product price					0.35
Local food labels				0.23	0.35
State branding programs					0.39
Local product quality				0.28	0.42
Healthy local food options				0.23	0.33
Community Engagement	Fresh food in low-income neighborhoods	0.36			0.28
	Cooking, food preservation, and consumer education programs	0.30			0.30
	Home and community gardens	0.31			0.32
	Food festivals				0.38
	Food banks/food pantries	0.27			0.42
	On-farm events	0.28			0.27
Organizational Support	Local government investment in local food programs	0.39			0.22
	Public market buildings and facilities	0.30			0.27
	Media coverage of local food events, products, and programs	0.32			0.35

identified four principal components. PC1 is dominated by food access and local government support, with notable loadings for fresh food in low-income neighborhoods, public investment, and media coverage. PC2 focuses on product quality, while PC3 and PC4 capture the influence of direct marketing and retail channels, respectively.

For the subset of larger metro regions (Table 10), the structure of principal components remains consistent with earlier results. PC1 is centered on food accessibility and support, PC2 on product quality and diversity, and PC3 and PC4 distinguish between direct marketing and retail channels. The consistency in the principal component structure

across survey waves, even in this subset, indicates stable resident priorities over time.

The ordered logit regression results for the subset of smaller communities are summarized in Table 11. PC1 (food access and government support) is the most influential factor, explaining 23% of the variance in perceived LFSV (coefficient = 1.00,  $p < 0.01$ ). None of the other principal components reaches statistical significance, though some marginal effects are observed. Among demographics, renters in the subset reported significantly lower perceived vitality than homeowners, while other demographic variables were not significant predictors.

**Table 6. Principal Component Analysis for Larger Communities (2018–2019)**

Local Food Systems (LFS) Component Category	LFS Components	PC1	PC2	PC3	PC4	Unexplained
Food Marketing Channels	Farmers markets			0.42		0.34
	Cooperative food stores/specialty stores/health food stores			0.33		0.44
	Grocery stores (retail)				0.56	0.31
	Restaurants				0.53	0.30
	Community supported agriculture (CSA)			0.42		0.34
	Food trucks			0.44		0.42
	Roadside markets or stands			0.35		0.42
	Microbreweries, distilleries, and/or wineries			0.39		0.45
	Institutions (hospitals, workplaces, state parks, etc.)				0.49	0.40
	Local Product Characteristics	Product diversity		0.37		
Identifiable farm brands			0.29			0.34
Competitive product price			0.36			0.37
Local food labels			0.34			0.34
State branding programs			0.38			0.39
Local product quality			0.45			0.27
Healthy local food options			0.29			0.37
Community Engagement	Fresh food in low-income neighborhoods	0.43				0.30
	Cooking, food preservation, and consumer education programs	0.36				0.28
	Home and community gardens	0.36				0.28
	Food festivals					0.47
	Food banks/food pantries	0.33				0.40
	On-farm events	0.28				0.33
Organizational Support	Local government investment in local food programs	0.35				0.32
	Public market buildings and facilities	0.26				0.35
	Media coverage of local food events, products, and programs	0.24				0.42

For the subset of larger metro regions (Table 12), PC1 (food access and government support) again has the strongest association with perceived LFSV, explaining 26% of the variance (coefficient = 0.60,  $p < 0.01$ ). PC2 (product quality) and PC4 (retail markets) are also significant in this subset, accounting for 4% and 3% of the variance, respectively. No demographic factors emerged as significant in the larger community subset.

## Discussion

This study provides new insights into the evolving landscape of LFSs in the Southern U.S. by examining resident perceptions across two time periods: an initial survey (2018–2019) and a follow-up survey (2022) for a subset of communities. This longitudinal approach enabled us to distinguish between factors that have remained stable and those that have undergone significant adaptation in response to external disruptions and shifting consumer contexts, a research priority repeatedly emphasized in recent LFS literature (Béné, 2020; Enthoven & Van den Broeck, 2021).

## *Enduring Foundations and Adaptive Priorities*

Across both survey waves, mainstream food outlets, including grocery stores, supermarkets, restaurants, and farmers markets, consistently emerged as the most visible and positively perceived components of LFSs, especially in metropolitan areas. This stability aligns with prior research underscoring the importance of robust infrastructure and consumer familiarity in maintaining LFSV (Martinez, 2021; Singleton et al., 2015). Concurrently, we observed modest but meaningful growth in resident awareness and perceived performance of niche or emerging channels such as food trucks, microbreweries, and CSAs (Tables A1 & A3), indicating the ability of larger markets to diversify and adapt to evolving consumer interests (Hait, 2020; Schreiber et al., 2022; Thilmany et al., 2021; Vecchi et al., 2022).

## *Institutional Support and Food Equity*

A prominent and persistent theme across both survey periods was the importance placed by residents on equitable food access and institutional support,

**Table 7. Regression for Smaller Communities (2018–2019)**

Variables	Pseudo $R^2 = 0.43$		$N = 356$
	Coefficient	Marginal Effect	Share of Variance Explained %
PC1 (Food access and local government support)	0.81*** (0.09)	0.04*** (0.00)	27.00%
PC2 (Direct market channel and local product quality)	0.44*** (0.09)	0.02*** (0.00)	6.00%
PC3 (Retail markets)	0.08 (0.10)	0.00 (0.01)	—
Age	0.01 (0.01)	0.00 (0.00)	—
Gender (Base = Female)			
Men	-0.11 (0.24)	-0.01 (0.01)	—
Income	0.00 (0.02)	0.00 (0.00)	—
Years of residency	0.00 (0.01)	0.00 (0.00)	—
Homeownership status (Base = Homeowner)			
Renter	-0.06 (0.29)	0.00 (0.00)	—
Local Food Interest (Base = Low interest in consuming local food)			
High interest in consuming local food	-0.24 (0.24)	-0.01 (0.01)	—

Note: Standard errors are in parentheses. \*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10% levels.

particularly from local governments. Despite external disruptions, community members consistently rated these factors as essential for a resilient LFS. This echoes numerous studies from both U.S. and international contexts, emphasizing the crucial role institutional engagement, inclusive planning, and equity-focused policies play in sustaining LFSs (Feldmann & Hamm, 2015; ICLEI, 2021; Johnston, 2023; Martínez, 2024; Rossi et al., 2017).

Respondents repeatedly highlighted affordable food access as a persistent challenge, reinforcing calls in recent literature for proactive government roles in mitigating barriers related to price, transportation, and accessibility (ICLEI, 2021; Martínez, 2024). This consistency in resident priorities signals clearly to policymakers that sustained institutional investments, including affordability initiatives, local procurement policies, and improvements in food distribution infrastructure, remain critical to maintaining LFSV and preventing equity gaps from widening.

### *Shifts in Consumer Expectations and Pandemic Impacts*

Our findings also identified notable shifts in consumer priorities, especially in larger metropolitan areas, emphasizing product quality, variety, and convenience. These trends, which were already emerging prior to the pandemic (Woods & Thilmany, 2018), were significantly accelerated by COVID-19, as consumers became more sensitive to supply chain transparency, safety, and consistent access (Vecchi et al., 2022). In response to these evolving consumer expectations, industry and academic research recommend strategies, such as enhanced product differentiation, streamlined purchasing processes, and increased use of digital marketing, to help LFSs remain competitive (Vecchi et al., 2022; Woods & Thilmany, 2018).

### *Rural and Urban Differentiation in LFSs*

Our results demonstrate clearly that a uniform approach to LFS development is ineffective; rather, distinct, place-based strategies are needed for rural

**Table 8. Regression for Larger Communities (2018–2019)**

Variables	Pseudo $R^2 = 0.37$		N = 574
	Coefficient	Marginal Effect	Share of Variance Explained
PC1 (Food access and local government support)	0.65*** (0.07)	0.04*** (0.00)	20.00%
PC2 (Product quality)	0.50*** (0.08)	0.03*** (0.01)	8.00%
PC3 (Direct market channel)	0.09 (0.08)	0.01 (0.01)	—
PC4 (Retail markets)	0.19** (0.08)	0.01** (0.01)	1.00%
Age	0.00 (0.01)	0.00 (0.00)	—
Gender (Base = Female)			
Men	0.35* (0.19)	0.02* (0.01)	1.00%
Income	0.03 (0.02)	0.00 (0.00)	—
Years of Residency	0.00 (0.01)	0.00 (0.00)	—
Homeownership status (Base = Homeowner)			
Renter	-0.27 (0.21)	-0.02 (0.01)	—
Local food interest level (Base = Low interest in consuming local food)			
High interest in consuming local food	0.00 (0.21)	0.00 (0.01)	—

Note: standard errors are in parentheses. \*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10% levels.

and urban communities, each leveraging different strengths. In rural areas, direct-to-consumer channels and robust personal networks remain central, underpinned by social capital built through trust and interpersonal relationships. Previous research has highlighted these relational dynamics as foundational to rural food systems (Hendrickson et al., 2018, 2020; Hinrichs, 2000). Our findings further confirm this, suggesting that investments in direct marketing education, community outreach, and programs that strengthen local social networks, such as farmer-led markets or food ambassador ini-

tiatives, could significantly enhance rural LFSV and long-term resilience. Conversely, urban LFSs increasingly depend on scaling up and professionalizing supply chains to meet the expectations of a larger and more diverse consumer base. Urban consumers place higher value on consistent availability, product variety, and retail accessibility, which compels local producers to adopt more structured operations, intermediary infrastructure (e.g., food hubs and aggregation services), and professional branding strategies (Mariola et al., 2022; Martinez, 2021; Thilmany et al., 2021). This distinction

**Table 9. Principal Component Analysis for Smaller Communities (Follow-up Survey, 2022)**

Local Food Systems (LFS) Components		PC1	PC2	PC3	PC4	Unexplained
Food Marketing Channels	Farmers markets			0.47		0.37
	Cooperative food stores/specialty stores/health food stores			0.38		0.35
	Grocery stores				0.61	0.23
	Restaurants				0.54	0.32
	Community supported agriculture (CSA)			0.39		0.46
	Food trucks			0.48		0.34
	Roadside markets or stands			0.31		0.44
	Microbreweries, distilleries, and/or wineries			0.28		0.59
	Institutions (hospitals, workplaces, state parks, etc.)				0.43	0.40
Local Product Characteristics	Product diversity		0.35			0.37
	Identifiable farm brands		0.32			0.36
	Competitive product price		0.33			0.33
	Local food labels		0.29			0.43
	State branding programs		0.39			0.34
	Local product quality		0.46			0.40
	Healthy local food options		0.28			0.25
Community Engagement	Fresh food in low-income neighborhoods	0.31				0.27
	Cooking, food preservation, and consumer education programs	0.36				0.24
	Home and community gardens	0.31				0.32
	Food festivals	0.29				0.45
	Food banks/food pantries					0.54
	On-farm events	0.32				0.35
Organizational Support	Local government investment in local food programs	0.34				0.37
	Public market buildings and facilities	0.41				0.31
	Media coverage of local food events, products, and programs	0.33				0.38

Note: The subset includes smaller areas (Upstate South Carolina, Knoxville, TN) and larger metro regions (Nashville, TN; Louisville, KY; Raleigh-Durham-Chapel Hill, NC).

implies that urban-focused interventions should prioritize supply chain coordination, investment in branding and value-added processing, and partnerships with retailers and institutions to broaden market reach and improve consumer-perceived performance of LFSs. By identifying and contextualizing these unique priorities, our study provides practical guidance for food system practitioners and policymakers: effective programming and resource allocation depend on recognizing and supporting the distinct pathways that foster LFSV in both rural and urban contexts.

**Study Limitations and Future Directions**

While this study provides valuable insights into LFSs, several limitations should be acknowledged. First, our follow-up survey did not explicitly measure the adoption of digital technologies or the rise of new market actors in local food distribution. However, recent literature clearly highlights the rapid growth and importance of these trends, particularly accelerated by the COVID-19 pandemic. The emergence of online farmers’ markets, meal kit services, and other e-commerce platforms underscores the increasing significance of digital literacy

**Table 10. Principal Component Analysis for Larger Communities (Follow-up Survey, 2022)**

Local Food Systems (LFS) Components Category	LFS Components	PC1	PC2	PC3	PC4	Unexplained
Food Marketing Channels	Farmers markets		0.35			0.47
	Cooperative food stores/specialty stores/health food stores					0.56
	Grocery stores				0.59	0.25
	Restaurants				0.59	0.31
	Community supported agriculture (CSA)			0.23		0.52
	Food trucks			0.53		0.36
	Roadside markets or stands					0.54
	Microbreweries, distilleries, and/or wineries			0.62		0.32
	Institutions (hospitals, workplaces, state parks, etc.)				0.34	0.59
Local Product Characteristics	Product diversity		0.44			0.33
	Identifiable farm brands		0.33			0.33
	Competitive product price		0.31			0.46
	Local food labels		0.26			0.47
	State branding programs		0.23			0.45
	Local product quality		0.30			0.44
	Healthy local food options		0.31			0.41
Community Engagement	Fresh food in low-income neighborhoods	0.31				0.33
	Cooking, food preservation, and consumer education programs	0.35				0.28
	Home and community gardens	0.30				0.33
	Food festivals	0.30				0.41
	Food banks/food pantries	0.32				0.47
	On-farm events	0.34				0.31
Organizational Support	Local government investment in local food programs	0.27				0.35
	Public market buildings and facilities	0.37				0.32
	Media coverage of local food events, products, and programs	0.29				0.39

Note: The subset includes smaller areas (Upstate South Carolina, Knoxville, TN) and larger metro regions (Nashville, TN; Louisville, KY; Raleigh-Durham-Chapel Hill, NC).

and technological infrastructure in shaping LFS resilience (Schreiber et al., 2022; Vecchi et al., 2022). Given these evolving trends, future research should explicitly incorporate measures of digital engagement. Integrating metrics such as producer e-commerce adoption rates, availability of local food delivery services, and community access to online information into existing assessment tools like the LFSV survey would more accurately capture the technological adaptations currently transforming LFSs.

Additionally, the geographic scope of our follow-up survey was limited to a subset of Southern U.S. communities, potentially restricting the generalizability of our findings. Future studies should include larger, more diverse samples to discern which trends have broad applicability and which are context specific. Moreover, further research is

needed to bridge the gap between perceptual indicators (e.g., awareness, performance, perceived importance) and actual behavioral outcomes (such as purchasing behavior and market participation). Addressing this gap will clarify how subjective measures translate into tangible economic and community impacts (Vecchi et al., 2022). Finally, the development of emerging intermediaries and collaborative partnerships, such as alliances between local farms and meal kit providers or institutional procurement initiatives focused on local sourcing, presents an important and promising area for future exploration. Investigating these innovative models will be critical to understanding how LFSs can effectively adapt to ongoing shifts in consumer preferences, technology, and policy contexts.



**Table 11. Regression for Smaller Communities (Follow-up Survey, 2022)**

Variables	Pseudo R <sup>2</sup> = 0.44		N = 153
	Coefficient	Marginal Effect	Share of Variance Explained %
PC1 (Food access and local government support)	1.00*** (0.17)	0.06*** (0.01)	23.00%
PC2 (Product quality)	0.25 (0.15)	0.02* (0.01)	—
PC3 (Direct market channel)	0.23 (0.15)	0.01 (0.01)	—
PC4 (Retail markets)	0.24 (0.15)	0.02 (0.01)	—
Age	0.00 (0.01)	0.00 (0.00)	—
Gender (Base = Female)			
Men	-0.56 (0.41)	-0.03 (0.02)	—
Income	0.01 (0.00)	0.00 (0.00)	—
Years of residency	0.02 (0.02)	0.00 (0.00)	—
Homeownership status (Base = Homeowner)			
Renter	-1.16** (0.42)	-0.08** (0.03)	4.00%
Local Food Interest (Base = Low interest in consuming local food)			
High interest in consuming local food	0.56 (0.43)	0.03 (0.03)	—

Note: standard errors are in parentheses. \*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10% levels. The subset includes smaller areas (Upstate South Carolina, Knoxville, TN) and larger metro regions (Nashville, TN; Louisville, KY; Raleigh-Durham-Chapel Hill, NC).

**Table 12. Regression for Larger Communities (Follow-up Survey, 2022)**

Variables	Pseudo R <sup>2</sup> = 0.30		N = 293
	Coefficient	Marginal Effect	Share of Variance Explained
PC1 (Food access and local government support)	0.60*** (0.08)	0.06*** (0.01)	26.00%
PC2 (Product quality)	0.28*** (0.09)	0.03*** (0.01)	4.00%
PC3 (Direct market channel)	0.04 (0.11)	0.00 (0.01)	—
PC4 (Retail markets)	0.25** (0.10)	0.02** (0.01)	3.00%
Age	0.00 (0.01)	0.00 (0.00)	—
Gender (Base = Female)			
Men	0.06 (0.26)	0.01 (0.03)	—
Income	0.00 (0.00)	0.00 (0.00)	—
Years of Residency	0.01 (0.01)	0.00 (0.00)	—
Homeownership status (Base = Homeowner)			—
Renter	0.29 (0.28)	0.03 (0.03)	—
Local Food Interest (Base = Low interest in consuming local food)			
High interest in consuming local food	0.16 (0.27)	0.02 (0.03)	—

Note: standard errors are in parentheses. \*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10% levels. The subset includes smaller areas (Upstate South Carolina, Knoxville, TN) and larger metro regions (Nashville, TN; Louisville, KY; Raleigh-Durham-Chapel Hill, NC).

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## Appendix

**Table A1. Awareness of Local Food Components in Different Communities (Follow-up Survey, 2022)**

Local Food Systems (LFS) Components		Smaller Communities (N = 486)	Larger Communities (N = 763)
Category	LFS Components		
Food Marketing Channels	Farmers markets	85.19%	91.48%
	Cooperative food stores/specialty stores/health food stores	82.72%	86.63%
	Grocery stores	99.59%	99.48%
	Restaurants	98.56%	98.69%
	Community Supported Agriculture (CSA)	65.43%	71.69%
	Food trucks	77.16%	86.76%
	Roadside markets or stands	78.40%	80.21%
	Microbreweries, distilleries, and/or wineries	74.90%	79.95%
	Institutions (hospitals, workplaces, state parks, etc.)	86.01%	89.25%
Local Product Characteristics	Product diversity	89.71%	90.83%
	Identifiable farm brands	86.42%	85.58%
	Competitive product price	92.80%	91.48%
	Local food labels	88.07%	90.17%
	State branding programs	83.74%	86.37%
	Local product quality	93.00%	92.14%
	Healthy local food options	91.15%	93.97%
Community Engagement	Fresh food in low-income neighborhoods	73.66%	80.08%
	Cooking, food preservation, and consumer education programs	80.45%	84.14%
	Home and community gardens	83.54%	87.94%
	Food festivals	89.51%	92.01%
	Food banks/food pantries	89.09%	91.74%
	On-farm events	77.57%	79.42%
Organizational Support	Local government investment in local food programs	69.75%	76.67%
	Public market buildings and facilities	80.66%	84.01%
	Media coverage of local food events, products, and programs	88.48%	89.12%

**Table A2. Demographic Profile of Respondents (Follow-up Survey, 2022)**

Demographic Variables	Smaller Communities (N = 153)	Larger Communities (N = 293)
Age (Year)	40.47	41.13
Gender		
Female	71.24%	64.85%
Male	28.76%	35.15%
Income		
Under 50K	54.25%	39.25%
50-99K	27.45%	43.68%
100-149K	15.03%	10.24%
150-199K	1.30%	2.73%
Over 200K	1.96%	4.10%
Years of residence (Year)	18.63	17.26
Homeowner status		
Homeowner	41.18%	38.23%
Renter	58.82%	61.77%
Local Food Interest Level		
Less interest in consuming local food	31.37%	35.84%
High interest in consuming local food	68.63%	64.16%

Note: The subset includes nonmetro/smaller areas (Upstate South Carolina, Knoxville, TN) and metro/larger regions (Nashville, TN; Louisville, KY; Raleigh-Durham-Chapel Hill, NC).

**Table A3. Mean Performance of LFS Components for Different Communities (Follow-up Survey, 2022)**

Local Food Systems (LFS) Components Category		Smaller Communities (N = 153)	Larger Communities (N = 293)
LFS Components		Mean	Mean
Food Marketing Channels	Restaurants	3.77	4.02***
	Grocery stores	3.85	3.97
	Farmers markets	3.69	3.83
	Institutions (hospitals, workplaces, state parks, etc.)	3.74	3.90*
	Microbreweries, distilleries, and/or wineries	3.42	3.77***
	Cooperative food stores/specialty stores/health food stores	3.48	3.66**
	Food trucks	3.35	3.67***
	Community Supported Agriculture (CSA)	3.23	3.47**
	Road-side markets or stands	3.08	3.17
Local Product Characteristics	Local product quality	3.75	3.83
	Healthy local food options	3.55	3.78**
	State branding programs	3.44	3.66**
	Competitive product price	3.45	3.52
	Product diversity	3.44	3.54
	Local food labels	3.46	3.49
	Identifiable farm brands	3.41	3.46
Community Engagement	Food banks/food pantries	3.56	3.65
	Food festivals	3.39	3.52
	Home and community gardens	3.20	3.27
	On-farm events	3.33	3.33
	Cooking, food preservation, and consumer education programs	3.22	3.15
	Fresh food in low income neighborhoods	2.97	2.94
Organizational Support	Media coverage of local food events, products, and programs	3.44	3.40
	Public market buildings and facilities	3.24	3.34
	Local government investment in local food programs	3.20	3.19
Overall vitality		3.58	3.68

Note: To avoid visual overload, significance markers are shown only on the mean performance of large communities, indicating a meaningful difference between community sizes.\*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10%. Within each category, LFS components are listed in order from highest to lowest mean performance according to responses from smaller communities. The subset includes smaller areas (Upstate South Carolina, Knoxville, TN) and larger metro regions (Nashville, TN; Louisville, KY; Raleigh-Durham-Chapel Hill, NC).

**Table A4. Sample Survey: Assessing Food Market Performance**

In this question, we ask you to rate the performance of different marketplaces in your local food environment. Local food refers to locally sourced fresh or processed food products. A marketplace can be considered HIGH PERFORMING (“Good” or “Excellent”) if it:

- offers, advertises, or promotes diverse, high-quality local food products,
- is generally accessible to members of the community and farmers from around the region,
- and/or exceeds your expectations.

With these considerations in mind, how would you rate the performance of the following marketplaces in your community’s local food environment?

	Don't Know	Extremely Poor	Poor	Average	Good	Excellent
Farmers markets	<input type="radio"/>					
Cooperative food stores/specialty stores/health food stores	<input type="radio"/>					
Grocery stores	<input type="radio"/>					
Restaurants	<input type="radio"/>					
Community supported agriculture (CSA)	<input type="radio"/>					
Food trucks	<input type="radio"/>					
Roadside markets or stands	<input type="radio"/>					
Microbreweries, distilleries, and/or wineries	<input type="radio"/>					
Institutions (hospitals, workplaces, state parks, etc.)	<input type="radio"/>					