

## Article

# The Impact of COVID-19 on Consumer Perceptions of Local Food Market Channels

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**Abstract:** The COVID-19 pandemic had a profound impact on food systems. Despite disrupting conventional markets—such as grocery stores—farmers that focused on short supply chains found new market opportunities. As consumers increasingly became concerned with the safety of in-person shopping, some turned to purchasing directly from farmers and markets that carried products marketed as local, organic, and/or sustainable. With these changes in mind, I ask how consumer perceptions of local food systems (LFSs) changed in the two years after COVID-19. If consumers are more aware of local markets, farmers might reorient production to focus on local supply chains and sustainable production methods. To evaluate consumer perceptions, I use survey responses from residents in five communities in the US South in 2019 and 2022. Using a treatment effects model with propensity score matching, I show that residents became more aware of most local market channels, such as specialty retail stores and Community Supported Agriculture (CSA). Some residents were also more likely to have a positive perception of markets that provide fresh vegetables to low-income residents. Finally, residents wanted more investment into markets that make fresh, local products more available, such as community-owned groceries and CSA.

**Keywords:** local food systems; COVID-19 impacts; food market channels; sustainable food systems; consumer perceptions



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## 1. Introduction

Since the start of the COVID-19 pandemic, food systems across the globe have experienced significant transformations [1,2]. In the United States (US), supply chain disruptions altered the market dynamics of farmers, consumers, and intermediaries [3,4]. For farmers who focused on direct-to-consumer sales in local/regional markets, global supply chain disruptions provided opportunities to fill some of the food supply gaps in 2020 and 2021 [5–7]. Local producers across the world played a critical role in addressing food shortages and meeting the food needs of food-insecure populations during the pandemic [1,8]. As producers reworked their distribution strategies to find new markets for their products, more consumers became aware of food acquisition options that were more direct or local. Adaptations by consumers and producers alike set the stage for the reconsideration of how local/regional production and distribution can improve the resilience of food systems in many countries [5,6,9,10].

In the article, I consider how local food systems (LFSs) have changed in the southeast region of the US in the two years following the COVID-19 pandemic. In particular, our narrative is guided by the following research questions:

- Which local market channels have been more visible to consumers since COVID-19? (*LFS Awareness*)
- How do consumers perceive these local market channels to meet their food acquisition needs and expectations? (*LFS Performance*)
- What local market channels need more investment to improve their quality? (*LFS Investment*)

To answer these questions, I analyze data from a survey given to residents of five communities in the US southeast before (early 2019) and after (early 2022) the start of the COVID-19 pandemic. Residents were asked to evaluate the performance (i.e., quality and activeness) of different local market channels in their community.

I hypothesized that residents would be more aware of and have a more positive perception of many local market channels following the initial pandemic experience. I also expected residents in many locales to be more interested in investments in local food markets and infrastructure. These hypotheses seemed reasonable since many consumers sought out local items for the first time during the initial stages of the pandemic [3]. Additionally, as noted above, innovations by actors in local/regional food systems were vital to addressing breakdowns in food supply in many communities around the world [1–10].

Since survey responses in 2019 were anonymous, and our research team obviously did not expect a major pandemic to occur, respondents from 2022 are not the same individuals. As such, I employ a quasi-experimental design that uses a propensity score matching approach to create pairs of pre-/post-pandemic responses based on demographic and question response similarity. This approach allows us to identify the effect that the pandemic as an event had on the perceived performance of ten different local food market channels, which is the main purpose of this manuscript.

While others have documented pandemic-related changes in consumer trends related to local food systems (LFS) [7,11,12], this approach is unique in that it evaluates consumer perceptions related to specific local market channels before and after the start of the pandemic. This approach also complements and extends COVID-19-related surveys on general consumer behaviors [11,12] and market channel usage measured in retrospect [7]. Consequently, this study is well-situated to provide insights into whether and to what extent consumer behaviors will endure as we enter a post-COVID-19 era. It also contributes to an emerging body of literature that considers consumer perceptions of and values related to LFS elements [13–16].

## 2. Literature Review—COVID-19 Impacts on Local Food Systems

The initial wave of COVID-19 had a profound impact on how and where food was available. In the US, supply chain disruptions in the retail sector were particularly noticeable. As workers in the processing, distribution, and retail sectors were exposed to the COVID-19 virus, the flow of products through these systems slowed. Consequently, retail grocery stores could not keep certain items stocked. For instance, meat and other processed items initially became scarce and expensive due to labor shortages in processing and packing facilities [4,17]. These facilities are generally designed to have workers in close proximity with few options for effective social distancing.

Restaurants closed (or shifted to take-out-only models) due to health considerations and decreased demand for in-person dining [11,12,18,19]. Institutional dining (i.e., schools and government facilities) was eliminated in many places due to the emergence of remote learning and work-at-home options [20]. Farmers markets were required to implement new safety protocols that limited the potential customer base, altered the flow of foot traffic through the market, or reduced the total number of vendors [21]. Specialty retailers, such as food co-ops, reduced in-store shopper density, offered exclusive shopping hours for immunocompromised people, and/or shifted to curb-side pick-up [22]. Many of these same trends, especially closures of farmers markets and restaurants, were felt globally [1–3,8,10].

With the extensive disruption to both larger-scale supply chains and direct-to-consumer (DTC) market channels, consumers across the world faced shortages of many typical food items. In response to these shortages and the perceived risk of infection from crowded food acquisition venues, they began using new strategies to acquire and prepare needed items. Many individuals shifted to preparing and/or growing food at home more frequently [1–3,23,24]. Some also began using online platforms to purchase food from grocers and farms to minimize potential exposure in places like South Korea, Brazil, Poland, the

UK, France, and the US [1–3,8,10]. In short, consumers responded to changes in perceived supply and safety of previous food acquisition strategies in a variety of ways [3,11,12,25].

One of the more compelling trends, however, was the increase in the number of consumers seeking out alternative, local market channels. One estimate shows that 1/3 of primary food buyers in the US purchased food from a new local food business or farmer for the first time during the pandemic [3]. Community-Supported Agriculture (CSA) producers reported a rapid increase in demand for their shares from 2020 to 2022 in the US, UK, and Australia [1,9,26,27]. Consumers were more willing to purchase full (or large) portions of animals from farmers who were able to get into smaller regional processing facilities—since meat shortages were becoming more common in retail settings [28]. In the US, independent grocers and international stores (and restaurants shifting to quasi-retail consumer boxes) had access to different supply chains than those used by mainline grocery chains [29]. They were able to offer consumers viable purchasing alternatives for certain products. With an increased willingness to buy directly from a farmer, specialty store, or international grocery, consumers in the US—and diverse locales such as Argentina, Austria, Japan, Hungary, and Poland—became more interested in local products and diversified their purchase patterns [1–3].

These new opportunities were critical to many farmers who initially lost access to restaurants and certain institutional market channels as stay-at-home policies restricted in-person dining [5]. They had to make alternative arrangements for their products or redirect production to meet changing levels of demand at different market channels. Farms that relied on wholesale markets to move/process large amounts of product faced significant challenges with finding suitable outlets. Smaller-scale operations were more able to adapt to changing market conditions by diversifying their market channels, especially if they were able to quickly shift to e-commerce platforms and/or rapidly implement new safety protocols [1,10,30]. However, these adaptations favored established, better-resourced farms that were already selling to local markets and further highlighted the structural inequalities faced by farmers of color and indigenous communities [5,10,31,32]. Some farmers engaged in different adaptations, such as multi-farm-aggregated food boxes and meal kits that focused on food relief in marginalized communities, including the food service sector [1,9,31,33]. Producers who could shift to DTC channels—farmers markets, on-farm retail, CSA, and e-commerce—found an increasingly receptive consumer base in many countries.

In short, consumers across the globe increasingly diversified their food acquisition patterns in the first 18 months of the pandemic. There is some evidence that those consumers new to local market channels persisted with their purchases [34]. Further, in the US, federal efforts to reshape and regionalize/localize food supply chains are focused on realizing the long-term resilience of food systems that are broadly inclusive and which meet the needs of many [35]. Finally, local farmers and food relief organizations worked together to provide cost offsets to SNAP recipients at farmers markets, CSAs, and independent retailers to make fresh, local food available to more people [36,37]. These adaptations—along with the food box relief programs—were particularly important as pandemic-related unemployment increased food insecurity and school lunch programs were altered in structure due to school closures [38].

The pandemic made clear that many communities are systemically excluded from participating in healthy, accessible food systems across the US. It also revealed that national/global scale production and distribution systems are vulnerable to widespread disruption. Recent inflationary pressures and Russia's invasion of Ukraine only reinforce this observation. While expanding local food production and distribution is not a cure-all for these many challenges, it does diversify options for food acquisition at different scales and provides opportunities for local economic growth. In short, the pandemic-induced shift toward local/regional production and consumption was profound and provided a foundation for re-envisioning food systems in many places.

With these qualifications in mind, I ask whether and to what extent the experience of the pandemic translates to increased consumer awareness of—and perspectives of market channel performance regarding—local/regional food options. In other words, how do residents perceive changes to their LFSs relative to their needs and expectations?

One of the design goals of this survey was to capture the impact of significant policy changes, investments, or geographically specific events on the evolution of LFSs. While we did not predict its onset, COVID-19 certainly constitutes a significant rupture of perceived normality and actual system function. As this survey was given at two time periods that straddle the onset of COVID-19 in the US, its data are well positioned to evaluate changes in resident perception of various aspects of their respective community's LFS.

### 3. Methods

In this section, I describe the methods used to collect data for this analysis. Data were collected in 5 separate communities via two surveys, before and after the start of COVID-19. Data were analyzed with a treatment effects model using propensity score matching to evaluate the effect of the pandemic on consumer perceptions of 10 different market channels where consumers might encounter locally sourced food items. Specific data collection methods and analytic approaches are described below.

#### 3.1. Respondent Recruitment

Data were collected using the Local Food Vitality (LFV) survey. This survey asks residents to evaluate the performance of 29 different aspects of their local food environment. These aspects are diverse and include the following:

- Market channels (such as farmers markets and food co-ops);
- Policy and marketing aspects (such as state branding programs and local food labels);
- Social aspects (such as food festivals and food assistance programs);
- Local product attributes (such as price, quality, and diversity).

In 2019, our research team surveyed residents in 13 locations in the US southeast. Locations were chosen based on consultations with local food experts and Extension agents. Each location was required to have evidence of local food activity and interest from stakeholders in developing their local food system.

Our initial goal was to survey 16 locations, but as we were preparing to survey the final 3 locations, COVID-19 emerged, and we re-evaluated our sampling process. The survey itself is designed to provide a baseline of local food activity at a particular point in time. In the scenario of a massive disruption to a system, which COVID-19 certainly was, we were well-positioned to resample selected locations to see how the pandemic impacted their LFSs. Consequently, we chose 5 locations to resurvey based on our ability to rapidly collect data in a socially distanced manner in early 2022. These locations were as follows:

- Louisville, KY;
- Nashville, TN;
- Knoxville, TN;
- Raleigh–Durham–Chapel Hill, NC (i.e., The Triangle);
- Greenville, Spartanburg, and Anderson County, SC (i.e., Upstate South Carolina).

We surveyed residents via online recruitment through Dynata—a survey service with respondent panels. We asked Dynata to recruit respondents proportionally according to property values and zip codes within each community. Our goal was 200 completed surveys within each community for each time period to ensure a high enough sample size to evaluate consumer segments within each community.

As shown in Table 1, the demographic values for each community are reasonably similar to census values for median household income and race. I did not compare age with the census age since individuals under 18 were not eligible to complete the survey. When comparing demographics within each community between survey events, there are some differences. The second survey tends to be closer to the census value for both race

and income, and the percentage of individuals with high interest in local food systems is lower. There is likely bias in responses toward those who have some interest in local food, and this may have some impact on respondent demographics. Nevertheless, our inclusion of the “interest in local food” variable in our analytic approach allows us to control for differences in respondent engagement with LFS activities.

**Table 1.** Demographics of Locations Surveyed with LFV Survey Instrument.

Survey	Survey		Median Household Income (In Thousands of Dollars)			Race (% Non-White)			Age (Mean)		Interest in Local Food (% High Interest)	
	1	2	1	2	Census	1	2	Census	1	2	1	2
Upstate SC	408	262	\$50–75K	\$25–50K	\$50K	17%	23%	29%	50	47	64%	58%
Louisville, KY	483	167	\$50–75K	\$25–50K	\$55K	19%	27%	32%	48	49	62%	55%
Nashville, TN	542	273	\$50–75K	\$50–75K	\$63K	23%	21%	28%	45	43	58%	59%
Knox County, TN	245	192	\$50–75K	\$25–50K	\$55K	10%	11%	18%	46	46	71%	54%
The Triangle, NC	584	281	\$50–75K	\$50–75K	\$67K	30%	37%	44%	47	45	64%	57%

Notes: Surveys 1 and 2 were conducted in 2019 and 2022, respectively. I compare demographic results for income and race to 2020 census data. In each survey, respondents were given a range of options to choose from for their household incomes in USD 25K intervals.

In short, survey participants likely represent a diverse (in terms of race and income) subsection of individuals who have some interest in local food systems. Because of differences between survey respondents in each of the survey events, I use a propensity score matching analysis to match individuals across time periods based on responses to demographic and other questions in the survey. This synthetic control approach creates a data set that is more comparable across time periods (i.e., a treatment). I discuss this model and approach below.

### 3.2. Survey Design

Our research team iteratively developed the survey from 2017 to 2019. We conducted two focus groups with residents in Lexington, Kentucky—a midsize city (which is not included in this current analysis)—to understand what LFS aspects are integral to creating a robust, vibrant, and resilient local food system. We compiled an extensive list of LFS aspects from these focus groups, workshopped them with selected local food researchers and Extension personnel across the US, and then developed a pilot survey. After conducting the pilot survey in one city, we re-evaluated the wording of questions and reworked which LFS aspects to include. The revised survey is what we used for both the 2019 and 2022 survey efforts. More detailed discussions of survey development are covered in separate publications [16,39].

The Local Food Vitality survey has a simple premise. Respondents are asked to evaluate the performance of 29 total LFS aspects. The question text is as follows: “How would you rate the performance of the following aspects of your community’s local food environment?” Performance is measured on a 5-point Likert scale where 1 = Very Poor, 3 = Average, and 5 = Excellent. We also provided respondents with a “Don’t Know” option for each aspect. We also provided respondents guidance on what constitutes high performance for different categories of aspects. In the category of market channels, the subject of this manuscript, respondents are told the following:

“A marketplace can be considered HIGH PERFORMING (“Good” or “Excellent”) if it performs the following:

- 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.”



Our current analysis focuses on 10 specific food acquisition channels (out of the 29 total aspects surveyed), which I hypothesized were affected by the COVID-19 pandemic. The channels are as follows:

- Farmers markets;
- Specialty retail (co-ops, health food stores, independent grocers, etc.);
- Conventional retail;
- International grocery (ethnic grocery);
- Restaurants;
- Community-Supported Agriculture (CSA);
- Home and community gardens;
- On-farm events (agritourism, farm stores, u-pick);
- Food banks and pantries;
- Cooking, preservation, and consumer education programs.

While the last aspect is not a market channel, it does support individuals' at-home food preparation efforts and informs consumers' knowledge about local market channels. With more individuals preparing food at home during the pandemic [11,12], it made sense to measure changes in participation in food-related education opportunities. It is also an indicator of how broad perceptions about LFSs may have shifted. These aspects serve as dependent variables in our treatment effects models.

In addition to the market channels, I included respondents' performance scores of product characteristics and social aspects of their LFSs. The performance definition for product aspects is: "Your community can be considered HIGH PERFORMING if (1) there are many different high-quality local product options, (2) it is easy to know if a product was grown or raised near your community, in your state, or on a particular farm, and/or (3) products exceed your expectations." I included the following social and product aspects in my model:

- Local product quality;
- Competitive product price;
- State branding programs (e.g., Kentucky Proud, Proud to Be NC, etc.);
- Media coverage of local food events.

Responses to these questions (in addition to standard demographic data) were included to match before (2019) and after (2022) responses using my propensity score matching approach.

Finally, we asked respondents "Where would you most like to see investment in your neighborhood food environment?". They provided an interest rating on a 5-point Likert scale (1 = Not Interested; 3 = Somewhat Interested; 5 = Very Interested) for investments in farmers markets, supermarkets, community-owned grocery stores, and weekly vegetable and fruit box delivery (i.e., CSA). From these responses, we can determine where priorities for investment have changed following the pandemic experience.

### 3.3. Analytic Approach

To understand the impact of the COVID-19 pandemic on LFS perceptions of 10 market channels and 4 investment areas, I developed a model that considers the COVID-19 pandemic as a treatment—in the sense that it was an event that induced broad system changes. Consequently, I consider survey responses collected in 2019 from our 5 communities as a control (i.e., untreated condition) and those from 2022 as the test group (i.e., treated condition) in a quasi-experimental design. By using a treatment effects model, we can estimate the degree to which the pandemic shifted residents' perceptions of awareness and performance of different aspects of their LFSs.

Since our data are observational and we do not have before and after responses from the same individuals, I use propensity score matching to pair responses in each sample (e.g., 2019) to responses in the other sample (e.g., 2022) based on the demographic characteristics and other survey responses of individual respondents. Using this technique, it is as if each

actual respondent had taken the same survey before and after COVID-19. From this, we can generate an average treatment effect—or a score that estimates the degree to which COVID-19 impacted individuals' perception of awareness and performance for specific LFS market channels.

I evaluate the treatment effect of COVID-19 for the following changes in respondents:

1. Awareness of each of the 10 LFS market channels;
2. Evaluations of the performance of each market channel;
3. Interest in investing in farmers markets, CSA, specialty retail, and conventional retail.

### 3.3.1. Market Channel Awareness Model

The awareness of market channels is derived from performance evaluations. If a respondent either provides a "Don't Know" performance score or a nonresponse, I consider the respondent to not be aware of the market channel. If they provide any other performance score (1 = Very Poor, 3 = Average, and 5 = Excellent), then the respondent is considered to be aware of that channel. For each of the 10 market channels, I recoded the performance score to a binary variable where "Don't Know" responses are coded 0 and any other performance score is coded 1. In short, awareness is a binary dependent variable in the context of the treatment effects model.

The treatment variable—time—is also binary with responses from 2019 and 2022 coded as 0 and 1, respectively. The variables used to match responses are as follows:

- Demographic;
  - Age (continuous);
  - Sex (categorical: 0 = female/1 = male);
  - Income (continuous);
  - Interest in local food (binary: 0 = No to Some Interest/1 = High Interest);
  - Years as a resident (continuous);
  - Race (binary: 0 = white/1 = non-White);
- Performance scores;
  - State branding programs (binary: 0 = not aware/1 = aware);
  - Media coverage of local food events (binary: 0 = not aware/1 = aware).

I included the two performance-based metrics as matching variables because I expected respondents who are aware of local food promotions might also be more aware of local market channels. The inclusion of these two variables, and the "interest in local food" variable, allows us to generate synthetic controls for those who have different levels of investment in local food, and thereby more tightly isolate the treatment effect of COVID-19 on residents' awareness. The interest in local food question was originally phrased "Please rate your general interest in locally grown or processed food items." The options were given on a 5-point Likert scale with 1 = Not Interested; 3 = Somewhat Interested; and 5 = Very Interested. I recoded this to a binary variable where values 1 to 3 = 0 and values 4 to 5 = 1. Since the awareness variable is binary, I used probit regressions in our awareness model.

### 3.3.2. Market Channel Performance Model

To understand the impact of COVID-19 on perceptions of market channel performance, I applied a similar model to the performance of each of the ten market channels. Here, the dependent variables are the performance scores of each market channel, though in this case, I retain their original 1-to-5 Likert score. Time is again our binary treatment variable. I used the same demographic variables as in the awareness treatment effect model to match respondents. But instead of the state branding programs and media coverage variable, I used the following variables as part of the match criteria:

- Performance scores;
  - Local product quality (ordered: 1–5 Likert);
  - Competitive product price (ordered: 1–5 Likert);

I used these two performance scores as part of the matching criteria because I expected that individuals with different perceptions of product quality and price competitiveness might have different ideas of what constitutes positive performance of the ten market channels. As the performance scores of the dependent variable are ordered, I use a logistic regression model as our regression option.

### 3.3.3. Market Channel Investment Model

Finally, I evaluated the impact of COVID-19 on individuals' interest in investing in four different market channels: farmers markets, specialty retail, CSA, and conventional retail. I used a similar treatment effect model to the market channel performance. The dependent variable is the interest level in investing in each market channel scored on a 5-point Likert (1 = Not Interested; 3 = Somewhat Interested; 5 = Very Interested). Time is again the treatment variable, and the same demographic variables as above are included in our match criteria. I did not include any performance variables in this model. Once I conducted a treatment effects model, I ran a separate ordered logit model using the same variables to identify who (in terms of demographics) is interested in specific investments.

I conducted each of these three analyses on the (1) pooled sample of responses and (2) each of the five communities to understand location-specific differences in perceptions of performance, awareness, and investment interest.

## 4. Results and Discussion

Table 2 shows where the COVID-19 pandemic has a significant impact on the awareness of each market channel in each selected community. The table presents the average treatment effects of the pandemic (i.e., the time variable) when matching individuals across groups according to their demographic characteristics. Blank spaces indicate that time was not a significant variable in respondent awareness. In other words, the treatment effect score indicates the magnitude and direction of changes in resident perception of each market channel after the start of COVID-19. Additionally, given that COVID-19 had significant impacts on food access and employment, I present awareness and performance changes among respondents earning less than USD 25K per year in household income in each table in rows denoted *Low Inc*.

**Table 2.** Impact of COVID-19 on Awareness of LFS Market Channels.

		Pooled	Upstate SC	Louisville, KY	Nashville, TN	Knoxville, TN	Triangle, NC
Farmers Markets	All <i>Low Inc</i>	−0.024 *	−0.124 *** −0.183 **			−0.097 ***	
Specialty Retail	All <i>Low Inc</i>	0.049 *** 0.056 *			0.063 **		0.096 ***
Conventional Retail	All <i>Low Inc</i>	0.015 ** 0.024 *	0.024 **	0.082 ***	0.033 *** 0.048 *		0.019 **
International Grocery	All <i>Low Inc</i>	0.079 ***		0.113 **	0.082 **		0.116 *** 0.150 **
Restaurants	All <i>Low Inc</i>	0.017 *** 0.048 *		0.073 ***		0.040 *	0.035 ***
CSA	All <i>Low Inc</i>	0.091 *** 0.129 **	0.110 *	0.100 *	0.115 ***		0.132 *** 0.206 **
On-Farm Events	All <i>Low Inc</i>	0.052 ***					



Table 2. Cont.

		Pooled	Upstate SC	Louisville, KY	Nashville, TN	Knoxville, TN	Triangle, NC
Gardens	All	0.091 ***		0.092 ***	0.073 **		0.116 ***
	Low Inc	0.185 ***	0.138 *	0.161 **			0.262 ***
Food Banks and Pantries	All	0.070 ***		0.104 ***	0.102 ***		0.145 ***
	Low Inc	0.103 ***	0.138 ***	0.160 ***			0.112 *
Consumer Food Education	All	0.078 ***		0.143 ***			0.115 ***
	Low Inc	0.133 ***	0.147 **	0.197 **			0.234 **

Notes: Scores are average treatment effects of COVID-19 on awareness of each market channel. \*\*\*, \*\*, \* represent significance at the 99%, 95%, and 90% levels, respectively. *Low Inc* represents the respondent segment that indicated their household income was less than USD 25,000 per year. Since the table above represents 120 separate regressions, it is not possible to show model fit statistics. However, pseudo R<sup>2</sup> for the associated probit models is at least 0.100 for each model and generally > 0.150.

#### 4.1. Market Channel Awareness

When responses are pooled across communities, respondents showed increased awareness of all market channels that carry or support local food items except for farmers markets (Table 2). The pandemic experience, according to this model, had the largest impact on awareness of CSA, community or home gardens, international grocery stores, and food education programs. Awareness of specialty retail and food banks also increased. While awareness of conventional retail and restaurants increased, the magnitude of change was much smaller. The only decrease in awareness was in the farmers market channel. Closures and operational changes might have affected individuals' ability to attend a farmers market, especially in 2020 [21].

Respondents with household incomes of less than USD 25K (i.e., *Low Inc* rows) became more aware of most LFS market channels and aspects. In particular, these respondents became more aware of gardens, food banks, consumer food education programs, and CSA. These LFS aspects often have the goal of improving access to food for residents (including CSA if reframed as a food box relief program) [26], so it is perhaps not surprising to see lower income respondents searching for these options in a time of crisis.

When we consider specific locations, different patterns of awareness emerge. For example, in Upstate South Carolina and Knoxville, residents became less aware of farmers markets. Knoxville's main market moved locations in 2020 to improve the ability of vendors and consumers to achieve appropriate social distancing measures [40]. They returned the following year to the normal location with spatial controls to manage foot traffic. It is possible that these changes impacted residents' awareness of the market. Farmers markets in Greenville and Spartanburg—primary population centers of Upstate SC—accommodated many farmers who shifted distribution strategies to compensate for the closure of other market channels [41]. However, they restricted vendor and visitor numbers which impacted sales compared with pre-COVID-19 [42].

In an opposite trend, respondents were increasingly more aware of Community-Supported Agriculture overall and in selected communities. For instance, pooled and low-income respondents in The Triangle became more aware of CSA. In early 2020, there was uncertainty and delays in opening Raleigh's farmers markets. Consequently, many vendors cooperated with each other to quickly shift to CSA-type models offered through diverse venues including churches [43,44]. Additionally, there has been long-standing support from Extension and research communities in NC to build awareness of local foods and to lower barriers to entry for CSA [45,46]. Similarly, CSA in Upstate SC was more visible to lower income residents during the pandemic as CSA-style food-relief boxes became a significant focus of local food activities [47]. These various efforts likely primed CSA for growth in awareness during the pandemic, especially with restrictions on farmers markets.

Residents in some locales exhibited increased awareness of retail market channels, though these changes were not observed in the lower income segment. Residents in Nashville and The Triangle became more aware of specialty retail (co-ops, health-food stores, delis, butchers, bakeries, etc.) and international grocery stores. Given the well-noted supply chain shortages in conventional retail stores, I expected that residents in many locales would use specialty stores for missing products. In Nashville and The Triangle—places with the largest population and significant cultural diversity—there are many specialty and international retail options. Perhaps COVID-19 pushed more individuals to shift purchasing toward these venues.

Awareness of gardens and food banks increased in all communities except for Knoxville. The pandemic was especially impactful on the awareness of these food acquisition venues for lower income residents of Louisville, The Triangle, and Upstate SC. COVID-19 had negative repercussions on employment in many sectors leading to increased pressure on food assistance organizations. In Louisville, many different actors came together to offer food relief to residents. Chefs worked with food pantries, the city school district, and even Churchill Downs to prepare meals for households faced with food insecurity [48].

A special point of emphasis in these programs was that many workers in the food service industry were themselves food insecure during the pandemic due to the closure of restaurants and institutions. The Lee Initiative's Restaurant Reboot Relief Program, for example, used restaurants and institutional kitchens to create meal boxes for food-insecure residents. This provided jobs (and meals) to restaurant workers affected by closures while improving the availability of food for low-income individuals [33]. The Lee Initiative shared this model with chefs in other cities including The Triangle and Nashville. In short, food banks and relief programs receiving increased support from other sectors—alongside higher rates of food insecurity due to COVID-19—may have directly impacted resident awareness of these options.

Finally, as residents generally sought different food acquisition venues during the early pandemic, they also became more aware of consumer food education programs such as cooking and food preservation classes. With increased interest in cooking and baking at home [11,12], it is not surprising that residents might begin searching out resources for meal preparation or gardening. Kentucky Cooperative Extension and Louisville nonprofits were extremely active during the early part of the pandemic in offering programs for meal planning and gardening [49]. Louisville's sharp increase in awareness of food education and gardens may reflect these efforts.

#### *4.2. Market Channel Performance*

Our awareness metric provides an overview of how the visibility of each market channel has changed since COVID-19 began. However, it does not tell us much about the quality of these market channels. Performance ratings—as perceived by respondents—are at the heart of our methodology.

For instance, Table 2 indicates that respondents became more aware of conventional grocery and restaurants in their communities after the pandemic. Yet, COVID-19 appears to have a significant negative impact on respondents' performance scores for restaurants, regardless of income, and conventional groceries for lower income residents (Table 3). In short, increases in awareness of grocery stores and restaurants might be related to persistent public discussions about supply chain struggles in the former and closures in the latter. While the aggregate responses show this negative performance trend, only The Triangle shows this result when considering site-specific responses.

Generally, there seems to be less of an impact (according to our model) of COVID-19 on residents' perceptions of performance (compared with awareness) for specific market channels. The only other market channels to show a post-COVID-19 difference are farmers markets, food pantries/banks, and international grocery stores. Farmers market performance is perceived to be lower for the pooled sample of respondents, but higher for those with lower incomes. The latter group may have benefited from increased investments in

SNAP and other programs that lowered the cost of fresh foods in farmers markets. Similarly, food banks provided access to items during a critical time of food insecurity.

**Table 3.** Effect of COVID-19 on Performance of LFS Market Channels.

		Pooled	Upstate SC	Louisville, KY	Nashville, TN	Knoxville, TN	Triangle, NC
Farmers Markets	All	−0.077 **					−0.194 ***
	Low Inc	0.162 *					
Specialty Retail	All		−0.331 ***				−0.167 **
	Low Inc				0.350 *		
Conventional Retail	All						−0.110 *
	Low Inc	−0.216 **					−0.890 **
International Grocery	All	0.089 *					
	Low Inc		−0.353 *		0.461 ***	−0.538 *	
Restaurants	All	−0.133 ***		−0.162 *			−0.175 ***
	Low Inc	−0.219 **	−0.355 **	−0.378 **			−0.712 ***
CSA	All		−0.253 **		−0.159 *	−0.247 *	
	Low Inc		−0.522 **		−1.127 *	0.527 *	0.423 **
On-Farm Events	All					0.211 *	
	Low Inc				−0.486 *		0.333 *
Gardens	All		−0.191 *				−0.176 *
	Low Inc		−0.537 *				
Food Banks and Pantries	All	0.143 ***					
	Low Inc				−0.592 **		0.512 **
Consumer Food Education	All					0.175 *	−0.226 **
	Low Inc						

Notes: Scores are average treatment effects of COVID-19 on the performance of each market channel. \*\*\*, \*\*, \* represent significance at the 99%, 95%, and 90% levels, respectively. *Low Inc* represents the respondent segment that indicated their household income was less than USD 25,000 per year. Since the table above represents 120 separate regressions, it is not possible to show model fit statistics. However, pseudo R<sup>2</sup> for the associated ordered logit models is at least 0.08 for each model and generally > 0.120.

Our results show a post-COVID-19 decrease in the perceived performance of specialty retail venues in The Triangle, NC, and Upstate SC. Conversely, lower income respondents in Nashville have a more positive view of these markets. Specialty retail businesses might also be expected to help residents meet food acquisition needs not provided by conventional retail outlets. Unique endeavors, such as The Store in Nashville, a free grocery store that works with food banks and distributors to provide food aid, may contribute to lower income residents' positive perception of specialty retail in that locale [50]. Nashville was also unique in that it was the only place where low-income respondents had a more positive view of international grocery stores. With different supply chains than conventional and specialty retail operations, perhaps these international markets filled the supply gaps or provided culturally appropriate food for residents in a time of need.

Food banks were observed to improve in quality in The Triangle for lower income respondents, while Nashville residents observed a decrease in performance. The latter community was impacted by a tornado at the same time that COVID-19 appeared in 2020. Food banks saw a sharp rise in demand and a decrease in donations from grocery stores and others due to supply chain and labor issues [51]. In North Carolina, Cooperative Extension worked with the county government and community partners to develop food hubs for food aid distribution using COVID-19 relief funds [52].

Triangle respondents were the only community to score farmers markets lower following the pandemic. As noted in the awareness analysis, many farmers adopted aggregated CSA-style distribution strategies due to uncertainty about farmers market opening times

during the 2020 season. Additionally, some of these CSA arrangements were focused on food relief which may explain why low-income residents perceived CSA to be better following the pandemic. These residents also expressed more positive perceptions of on-farm events. It is possible, then, that residents were purchasing food more directly from farmers, though not at farmers markets. Similarly, lower income Knoxville respondents had a more positive view of CSA, while the full sample there noted a decrease in performance. Perhaps CSA boxes were reframed as food aid during COVID-19.

Finally, on-farm events became more favored by residents in Knoxville and The Triangle, but less so in Nashville. Local farmers may have marketed direct purchase and/or agritourism opportunities during the initial COVID-19 lockdowns in ways that had lasting impacts on these communities. In short, I observed changes in quality for some market channels, though COVID-19 seems to have more of a measurable effect on consumer awareness of these channels.

### 5. What Types of Investments Do Residents Want to See in Their LFSs?

Given the wide-ranging impacts of COVID-19, I was curious about where residents had an interest in further investment in their food systems. I compare the interest level of investments in four different market channels before and after 2020 to understand if the pandemic experience led to residents prioritizing different investments. This question was different from those in the performance and awareness section and worded: “Where would you most like to see investment in your neighborhood food environment?”. Respondents provided an interest rating on a 5-point Likert scale where 1 = Not Interested; 3 = Somewhat Interested; 5 = Very Interested.

Table 4 shows whether responses differed by time (pre- vs. post-2020) using the same variables from the treatment effects model as in the analysis above. Respondents generally increased their interest in CSAs and specialty retail outlets. Interest in farmers market investments only decreased for Knoxville and did not change in all other communities surveyed.

**Table 4.** Impact of COVID-19 on Interest in Market Channel Investments.

	Pooled	Upstate SC	Louisville, KY	Nashville, TN	Knoxville, TN	Triangle, NC
Farmers Markets					−0.401 ***	
Specialty Retail and Community Owned Grocery	0.102 *			0.244 **		0.273 **
Conventional Retail		−0.231 **				−0.170 *
CSA	0.310 ***	0.538 ***	0.226 *	0.676 ***		0.472 ***

Note: Scores are average treatment effects of COVID-19 on each market channel. \*\*\*, \*\*, \* represent significance at the 99%, 95%, and 90% levels, respectively. Since the table above represents 24 separate regressions, it is difficult to show model fit statistics. However, pseudo  $R^2$  for the associated ordered logit models is at least 0.03 for each model and generally > 0.08.

CSA was the market channel with the most increase in interest in each surveyed community except for Knoxville. As Table 3 indicates, however, CSA experienced a decrease in performance after COVID-19 for most communities except for Louisville and The Triangle. In the latter community and Knoxville, lower income residents saw an improvement in performance. Coupled with a widespread increase in awareness of the CSA model (Table 2), it is worth considering whether residents, in many cases, saw this as an important food acquisition model that was either inaccessible due to cost, low supply, or increased demand for CSA during 2020 and 2021. Whatever the reason for the lower performance, residents in most communities appear to value the concept and want more investment into CSA options.

Specialty retail was of increased interest in Nashville and The Triangle (Table 4). The specialty retail category in this set of questions includes independent and community-owned

grocery stores. Lower income Nashville residents had a positive change in their perception of specialty retail while Triangle residents overall noted no change in performance (Table 3). Given the overall decrease in performance scores for conventional retail for low-income respondents (Table 3), it is worth considering whether respondents feel that different types of grocery stores are important options for when supply chains are disrupted. For some communities, specialty stores met the needs of residents while others saw them as lacking. Interest in investments in more diverse retail options is noted in Table 4.

#### *Who Is Interested in Different LFS Investments?*

To understand who is interested in investing in certain market channels, I conducted an ordered logit model on the investment questions using a few key demographic criteria. In the pooled respondent sample, CSA investments are favored by younger, non-White, lower income individuals who have lived in the same community for multiple years (Table 5). This general trend is reflected in Upstate SC, Louisville, and The Triangle. As discussed above, CSA in The Triangle has operators who subsidize CSA to make it an option in food relief efforts. In Louisville, New Roots offers a sliding-scale CSA in lower income neighborhoods for similar reasons (<https://newroots.org/>, accessed on 17 March 2024). This model started prior to COVID-19. Other CSAs near Louisville are also experimenting with Double Up Food Bucks models where SNAP benefits are multiplied to incentivize fresh food purchasing from local farmers.

**Table 5.** CSA Investment Interest by Locale and Demographics via Ordered Logistic Regression.

	Pooled	Upstate SC	Louisville, KY	Nashville, TN	Knoxville, TN	Triangle, NC
Time (Post-COVID-19)	0.116 ***	0.160 ***	0.060 *	0.151 ***	0.095 **	0.192 ***
Income (USD 1000)	−0.000 ***	−0.000 *	−0.001 **		−0.000 **	−0.000 ***
Age (Years)	−0.004 ***	−0.004 ***	−0.002 ***	−0.005 ***	−0.004 ***	−0.004 ***
Year of Residence (Years)	0.002 **					
Interest in Local Food (High)	0.150 ***	0.166 ***	0.195 ***	0.160 ***	0.185 ***	0.136 ***
Race (Non-White)	0.099 ***	0.090 **	0.062 *	0.105 ***		0.104 ***
Log-likelihood	−4484.0	−819.5	−910.3	−1021.4	−543.6	−1151.7
Pseudo R <sup>2</sup>	0.054	0.066	0.049	0.067	0.062	0.051
N	3052	573	625	707	377	770

Note: Scores are the combined marginal effects of each variable on the likelihood that an individual would choose “Interested” (4) and “Very Interested” (5) in the ordered logit model. \*\*\*, \*\*, \* represent significance at the 99%, 95%, and 90% levels, respectively.

Lower income individuals and respondents of color seemingly value CSA as a food acquisition option, which both confirms and complicates the narrative that CSAs are primarily a White middle-class phenomenon. In some communities, organizations are developing models to improve the accessibility of CSA. Examples include the CSA Innovation Network (<https://www.csainnovationnetwork.org/>, accessed on 17 March 2024), New Roots (<https://newroots.org/>, accessed on 17 March 2024), and organizations associated with the Gus Schumacher Nutrition Incentive Program (<https://www.nutritionincentivehub.org>, accessed on 17 March 2024). The pandemic accelerated some of these adaptations as consumers were searching for safe ways to acquire food. Stakeholders are continuing to make the model more conducive to food aid and improve access to fresh food in many communities. However, these investment results (along with the performance scores in Table 3) suggest that further funds, social infrastructures, and public policies are required to make CSA more accessible.

Specialty retail follows a similar general pattern to CSA (Table 6). Younger, lower income, non-White individuals who have some time investment in the same community are more likely to want investment in venues like co-ops, community-owned grocery stores, and specialized retail operations. Some specialty retail operations have worked with food

banks and charitable organizations to operate as de facto food pantries, such as The Store in Nashville. Some are located in neighborhoods with few retail grocery options, such as the Black Farmers’ Hub in Raleigh [53]. Others market a safe, less crowded environment to shop in during the pandemic. In many cases, these stores filled the niche of products absent from the shelves of conventional groceries [22,29].

**Table 6.** Specialty Retail Investment Interest by Locale and Demographics via Ordered Logistic Regression.

	Pooled	Upstate SC	Louisville, KY	Nashville, TN	Knoxville, TN	Triangle, NC
Time (Post-COVID-19)	0.063 ***	0.079 **		0.072 ***		0.090 ***
Income (USD 1000)	−0.000 ***	−0.001 *	−0.000 *			−0.000 ***
Age (Years)	−0.003 ***	−0.004 ***	−0.001 *	−0.003 ***		−0.003 ***
Year of Residence (Years)						
Interest in Local Food (High)	0.216 ***	0.232 ***	0.221 ***	0.203 ***	0.214 ***	0.200 ***
Race (Non-White)	0.033 **		0.076 **			
Log-likelihood	−4269.7	−780.0	−896.8	−987.1	−486.5	−1093.3
Pseudo R <sup>2</sup>	0.063	0.074	0.054	0.063	0.090	0.057
N	3064	573	625	716	381	769

Note: Scores are the combined marginal effects of each variable on the likelihood that an individual would choose “Interested” (4) and “Very Interested” (5) in the ordered logit model. \*\*\*, \*\*, \* represent significance at the 99%, 95%, and 90% levels, respectively.

Despite these innovations, not all investments come to fruition. A high-profile investment in a food hub and retail site in a predominantly black neighborhood in Louisville failed to emerge after its major funder pulled out [54]. This investment would have provided jobs and access to fresh foods in an area with few grocery stores. In a related vein, resident interest in more supermarkets (i.e., conventional retail) is preferred by older, non-White individuals in the pooled sample (Table 7). Given the long history of race-based exclusion of neighborhoods from fresh food access in the United States, it is not surprising that respondents of color see investments in supermarkets (as well as specialty retail) as a priority.

**Table 7.** Conventional Retail Investment Interest by Locale and Demographics via Ordered Logistic Regression.

	Pooled	Upstate SC	Louisville, KY	Nashville, TN	Knoxville, TN	Triangle, NC
Time (Post-COVID-19)	−0.028 *	−0.076 **				
Income (USD 1000)						
Age (Years)	0.001 ***		0.001 **		0.005 ***	
Year of Residence (Years)				−0.002 *		
Interest in Local Food (High)	0.126 ***	0.127 ***	0.114 ***	0.139 ***	0.105 ***	0.104 ***
Race (Non-White)	0.093 ***	0.086 *				0.128 ***
Log-likelihood	−4495.4	−840.7	−922.7	−1011.3	−572.3	−1125.3
Pseudo R <sup>2</sup>	0.018	0.020	0.022	0.024	0.026	0.015
N	3180	598	650	734	401	797

Note: Scores are the combined marginal effects of each variable on the likelihood that an individual would choose “Interested” (4) and “Very Interested” (5) in the ordered logit model. \*\*\*, \*\*, \* represent significance at the 99%, 95%, and 90% levels, respectively.

A final observation is that when I conducted ordered logit models on the farmers market investment question, the only variable that increased interest in investments was ‘interest in local food’. Consequently, I do not present a table with these results since they provide no insight into who is interested in more investment.



## 6. Conclusions

COVID-19 disrupted and reshaped local food systems globally. The results of this manuscript suggest that survey respondents in the US southeast generally became more aware of many different types of food market channels. While site-specific differences occur, residents—especially those with lower household incomes—became more aware of CSA, gardens, food banks/pantries, and food education opportunities. These results cohere with many observed in other countries, where CSA and home gardening became important food sources, sometimes tied to food security programs [1,8]. Beyond this, US residents were generally more aware of alternative retail sites, including international grocery stores. These changes support observations that COVID-19 forced individuals to shift their food acquisition strategies, try new local market channels, and prepare food at home more frequently [3,11,12,25,34].

Results from this analysis also suggest that COVID-19 impacted the performance of local market channels in geographically specific ways. In some places, like Nashville, it appears that international and specialty retail may have fulfilled the needs of lower income residents in ways that other market channels, such as CSA, did not. In The Triangle, CSA and food banks may have made up for perceived declines in conventional retail and farmers markets for lower income residents. These results, in particular, open up questions about the role of local/regional food market channels in improving food security for local residents. The pandemic further revealed the vulnerability of certain resident groups and also created newly food-insecure households. Yet, as discussed above, organizations at local, regional, and national levels developed innovative strategies to leverage local/regional supply chains, direct farm purchases, and parallel supply chains (e.g., those of international/specialty grocers and restaurants) to offer some level of relief. This parallels observations in many countries outside of the US [1,2,8–10]. Consequently, local and regional food systems can be part of a broader set of relief measures, but only if there is more investment in LFS activities that improve accessibility to and participation in the local food economy.

Some have argued that diversifying and localizing production/distribution can confer resilience to food systems in the US. The US Department of Agriculture's (USDA) Resilience Playbook [35] and various Federal investments into developing resilient supply chains and regional food economies certainly operate on this idea [55]. The Playbook, in particular, advocates for food systems that are inclusive, multiscale, and diverse in terms of both stakeholder composition and food-related activities. Additionally, the recently established Regional Food Business Centers are tasked with coordinating local/regional food system development activities. They are also designed to provide a connection between stakeholders at different scales (local to regional to national) to assess food system needs in diverse locales. They also require developing ways to engage with systemically excluded stakeholders to facilitate access to funds that support food-related enterprises [56]. Ideally, these centers will support the development of more robust and inclusive LFSs that make food and market access less vulnerable to disruption.

Returning to this analysis, it is worth wondering whether changes in consumer perception of LFSs will endure. Will people in these communities continue to explore local food markets? Will investments in or changes to particular aspects of LFSs lead to unique stakeholder and resident synergies? Will food assistance organizations continue to engage with local/regional farmers? Will the Regional Food Business Centers stimulate more engagement between stakeholders in ways that improve consumer perception of and participation in LFSs?

Now that the pandemic has become endemic, and communities have started settling into new ways of being, there are many potential pathways for LFSs to evolve. This points to the main limitation of our approach. Specifically, this post-COVID-19 survey was conducted at a time when consumer food shopping behaviors were still evolving alongside the pandemic. This post-COVID-19 survey, then, is only a snapshot of how the pandemic immediately affected these communities. In the future, we intend to use our methodology

to resurvey these communities to determine the durability and shape of perceptual changes as the initial pandemic experience recedes and COVID-19-era investments into LFSs begin to mature. Finally, we were limited in our ability to resurvey the other eight communities—especially the rural locales—that were included in our 2019 effort. We may revisit these locations with the same survey in the future to see how consumer perceptions have changed now that many locations are receiving significant investments in developing local and regional supply chains for food products.

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## References

1. Nemes, G.; Chiffolleau, Y.; Zollet, S.; Collison, M.; Benedek, Z.; Colantuono, F.; Dulsrud, A.; Fiore, M.; Holtkamp, C.; Kim, T.-Y.; et al. The impact of COVID-19 on alternative and local food systems and the potential for the sustainability transition: Insights from 13 countries. *Sustain. Prod. Consum.* **2021**, *28*, 591–599. [\[CrossRef\]](#) [\[PubMed\]](#)
2. Dudek, M.; Śpiewak, R. Effects of the COVID-19 pandemic on sustainable food systems: Lessons learned for public policies? The case of Poland. *Agriculture* **2022**, *12*, 61. [\[CrossRef\]](#)
3. Thilmany, D.; Brislen, L.; Edmondson, H.; Gill, M.; Jablonski, B.B.R.; Rossi, J.; Woods, T.; Schaffstall, S. Novel methods for an interesting time: Exploring US local food systems' impacts and initiatives to respond to COVID. *Aust. J. Agric. Resour. Econ.* **2021**, *65*, 848–877. [\[CrossRef\]](#) [\[PubMed\]](#)
4. Weersink, A.; von Massow, M.; Bannon, N.; Ifft, J.; Maples, J.; McEwan, K.; McKendree, M.G.; Nicholson, C.; Novakovic, A.; Rangarajan, A.; et al. COVID-19 and the agri-food system in the United States and Canada. *Agric. Syst.* **2021**, *188*, 103039. [\[CrossRef\]](#) [\[PubMed\]](#)
5. Durant, J.L.; Asprooth, L.; Galt, R.E.; Schmulevich, S.P.; Manser, G.M.; Pinzón, N. Farm resilience during the COVID-19 pandemic: The case of California direct market farmers. *Agric. Syst.* **2023**, *204*, 103532. [\[CrossRef\]](#) [\[PubMed\]](#)
6. Marusak, A.; Sadeghiamirshahidi, N.; Krejci, C.C.; Mittal, A.; Beckwith, S.; Cantu, J.; Morris, M.; Grimm, J. Resilient regional food supply chains and rethinking the way forward: Key takeaways from the COVID-19 pandemic. *Agric. Syst.* **2021**, *190*, 103101. [\[CrossRef\]](#)
7. Thilmany, D.; Canales, E.; Low, S.A.; Boys, K. Local food supply chain dynamics and resilience during COVID-19. *Appl. Econ. Perspect. Policy* **2021**, *43*, 86–104. [\[CrossRef\]](#)
8. Blay-Palmer, A.; Santini, G.; Halliday, J.; Malec, R.; Carey, J.; Keller, L.; Ni, J.; Taguchi, M.; van Veenhuizen, R. City region food systems: Building resilience to COVID-19 and other shocks. *Sustainability* **2021**, *13*, 1325. [\[CrossRef\]](#)
9. Jones, S.; Krzywoszynska, A.; Maye, D. Resilience and transformation: Lessons from the UK local food sector in the COVID-19 pandemic. *Geogr. J.* **2022**, *188*, 209–222. [\[CrossRef\]](#)
10. Zollet, S.; Colombo, L.; De Meo, P.; Marino, D.; McGreevy, S.R.; McKeon, N.; Tarra, S. Towards territorially embedded, equitable and resilient food systems? Insights from grassroots responses to COVID-19 in Italy and the city region of Rome. *Sustainability* **2021**, *13*, 2425. [\[CrossRef\]](#)
11. Bender, K.E.; Badiger, A.; Roe, B.E.; Shu, Y.; Qi, D. Consumer behavior during the COVID-19 pandemic: An analysis of food purchasing and management behaviors in US households through the lens of food system resilience. *Socio-Econ. Plan. Sci.* **2022**, *82*, 101107. [\[CrossRef\]](#) [\[PubMed\]](#)
12. Ellison, B.; McFadden, B.; Rickard, B.J.; Wilson, N.L. Examining food purchase behavior and food values during the COVID-19 pandemic. *Appl. Econ. Perspect. Policy* **2021**, *43*, 58–72. [\[CrossRef\]](#)
13. Tregear, A. Progressing knowledge in alternative and local food networks: Critical reflections and a research agenda. *J. Rural. Stud.* **2011**, *27*, 419–430. [\[CrossRef\]](#)
14. Galt, R.; Bradley, K.; Christensen, L.O.; Munden-Dixon, K. The (un) making of “CSA people”: Member retention and the customization paradox in Community Supported Agriculture (CSA) in California. *J. Rural. Stud.* **2019**, *65*, 172–185. [\[CrossRef\]](#)

15. Pole, A.; Kumar, A. Segmenting CSA members by motivation: Anything but two peas in a pod. *Br. Food J.* **2015**, *117*, 1488–1505. [CrossRef]
16. Rossi, J.; Woods, T. How do residents perceive local food system activity? Perspectives of system performance and awareness using the local food vitality survey. *Local Dev. Soc.* **2023**, 1–24. [CrossRef]
17. NMPAN. Niche Meat Processor Assistance Network—Impact Assessment II. *Local Food Systems Response to COVID*. 2021. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/niche-meat-processor-assistance-network-nmpan-may-2021/](https://lfscovid.localfoodeconomics.com/impact_assessments/niche-meat-processor-assistance-network-nmpan-may-2021/) (accessed on 24 April 2024).
18. James Beard Foundation. Impact Assessment. *Local Food Systems Response to COVID*. 2020. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/the-james-beard-foundation/](https://lfscovid.localfoodeconomics.com/impact_assessments/the-james-beard-foundation/) (accessed on 24 April 2024).
19. James Beard Foundation. Impact Assessment II. *Local Food Systems Response to COVID*. 2021. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/the-james-beard-foundation-may-2021/](https://lfscovid.localfoodeconomics.com/impact_assessments/the-james-beard-foundation-may-2021/) (accessed on 24 April 2024).
20. FINE. Farm to Institution New England—Impact Assessment. *Local Food Systems Response to COVID*. 2020. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/farm-to-institution-new-england-fine/](https://lfscovid.localfoodeconomics.com/impact_assessments/farm-to-institution-new-england-fine/) (accessed on 24 April 2024).
21. FMC. Farmers Market Coalition—Impact Assessment II. *Local Food Systems Response to COVID*. 2021. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/farmers-market-coalition-fmc-may-2021/](https://lfscovid.localfoodeconomics.com/impact_assessments/farmers-market-coalition-fmc-may-2021/) (accessed on 24 April 2024).
22. National Co-op Grocers. Impact Assessment. *Local Food Systems Response to COVID*. 2020. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/national-coop-grocers/](https://lfscovid.localfoodeconomics.com/impact_assessments/national-coop-grocers/) (accessed on 24 April 2024).
23. Mead, B.R.; Davies, J.A.; Falagán, N.; Kourmpetli, S.; Liu, L.; Hardman, C.A. Growing your own in times of crisis: The role of home food growing in perceived food insecurity and well-being during the early COVID-19 lockdown. *Emerald Open Res.* **2023**, *1*, 1–18. [CrossRef]
24. Skalkos, D.; Kalyva, Z.C. Exploring the impact of COVID-19 pandemic on food choice motives: A systematic review. *Sustainability* **2023**, *15*, 1606. [CrossRef]
25. Roe, B.E.; Bender, K.; Qi, D. The impact of COVID-19 on consumer food waste. *Appl. Econ. Perspect. Policy* **2021**, *43*, 401–411. [CrossRef]
26. CSA-IN. CSA Innovation Network—Impact Assessment II. *Local Food Systems Response to COVID*. 2021. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/csa-innovation-network-csa-in-may-2021/](https://lfscovid.localfoodeconomics.com/impact_assessments/csa-innovation-network-csa-in-may-2021/) (accessed on 24 April 2024).
27. CSA-IN. CSA Innovation Network—Impact Assessment. *Local Food Systems Response to COVID*. 2020. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/csa-innovation-network-csa-in/](https://lfscovid.localfoodeconomics.com/impact_assessments/csa-innovation-network-csa-in/) (accessed on 24 April 2024).
28. NMPAN. Niche Meat Processor Assistance Network—Impact Assessment. *Local Food Systems Response to COVID*. 2020. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/niche-meat-processor-assistance-network-nmpan/](https://lfscovid.localfoodeconomics.com/impact_assessments/niche-meat-processor-assistance-network-nmpan/) (accessed on 24 April 2024).
29. National Grocers Association. Impact Assessment. *Local Food Systems Response to COVID*. 2020. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/national-grocers-association-foundation-ng-a-foundation/](https://lfscovid.localfoodeconomics.com/impact_assessments/national-grocers-association-foundation-ng-a-foundation/) (accessed on 24 April 2024).
30. NAFDMA. North American Farmers Direct Marketing Association—Impact Assessment. *Local Food Systems Response to COVID*. 2020. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/north-american-farmers-direct-marketing-association-nafdma/](https://lfscovid.localfoodeconomics.com/impact_assessments/north-american-farmers-direct-marketing-association-nafdma/) (accessed on 24 April 2024).
31. CEFS. Center for Environmental Farming Systems—Impact Assessment. *Local Food Systems Response to COVID*. 2020. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/center-for-environmental-farming-systems-cefs/](https://lfscovid.localfoodeconomics.com/impact_assessments/center-for-environmental-farming-systems-cefs/) (accessed on 24 April 2024).
32. IFAI. Indigenous Food & Agriculture Initiative. Impact Assessment. *Local Food Systems Response to COVID*. 2020. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/american-indian-and-alaska-native/](https://lfscovid.localfoodeconomics.com/impact_assessments/american-indian-and-alaska-native/) (accessed on 24 April 2024).
33. Rossi, J. LEE Initiative Restaurant Reboot Relief Program. *University of Kentucky AEC Extension Publication* 2020, LSF-IB-07. Available online: <https://lfscovid.localfoodeconomics.com/wp-content/uploads/2021/02/LEE-Initiative-1.pdf> (accessed on 24 April 2024).
34. Christensen, L.; Rossi, J.; Thilmany, D. Exploring Awareness and Promotional Linkages to New Market Channels. *Colorado State Extension Publication* 2022, LFS-CFI-2.04. Available online: <https://lfscovid.localfoodeconomics.com/wp-content/uploads/2022/08/LFS-CFI-2-04.pdf> (accessed on 24 April 2024).
35. USDA AMS. The Local and Regional Food Systems Resilience Playbook. USDA AMS. 2023. Available online: <https://storymaps.arcgis.com/stories/8aaa431dad2f41d0afc72d157c865775> (accessed on 26 April 2024).
36. Haidar, A.; Markham, C.; Marshall, A.; Chuang, R.-J.; Spence, M.; Boone, J.; Pomeroy, M.; Dachman, R.; Davis, J.N.; Sharma, S.V. Innovative partnerships to address food insecurity during the COVID-19 pandemic: The brighter bites produce voucher program. *Int. J. Environ. Res. Public Health* **2021**, *18*, 9175. [CrossRef] [PubMed]
37. Wentworth, C.; Warsaw, P.; Isaacs, K.; Traore, A.; Hammon, A.; Lewis, A. The resilience and viability of farmers markets in the United States as an alternative food network: Case studies from Michigan during the COVID-19 pandemic. *Agric. Hum. Values* **2023**, *40*, 1481–1496. [CrossRef] [PubMed]

38. NFSN. National Farm to School Network—Impact Assessment. *Local Food Systems Response to COVID*. 2020. Available online: [https://lfscovid.localfoodeconomics.com/impact\\_assessments/national-farm-to-school-network-nfsn/](https://lfscovid.localfoodeconomics.com/impact_assessments/national-farm-to-school-network-nfsn/) (accessed on 24 April 2024).
39. Rossi, J.; Woods, T.; Davis, A. Resident perspectives on local food system performance and development priorities: A pilot analysis of the local food vitality index. *Local Dev. Soc.* **2020**, *1*, 116–139. [CrossRef]
40. Anonymous. Downtown Farmers’ Market Returns With New Twists. *Inside of Knoxville*. Available online: <https://insideofknoxville.com/2021/03/downtown-farmers-market-returns-with-new-twists/> (accessed on 29 March 2021).
41. Anonymous. Local Growers Push through COVID-19 With Help From Farmers’ Markets. *WSPA*. Available online: <https://www.wspa.com/news/coronavirus/local-growers-push-through-covid-19-with-help-from-farmers-markets/> (accessed on 10 July 2020).
42. Shirvell, Bridget. Farmers’ Markets Face Year Two of the Pandemic. *FoodPrint*. 2021. Available online: <https://foodprint.org/blog/farmers-markets-pandemic/> (accessed on 24 April 2024).
43. Ginsburg, E. Black-Owned Farmland Is Disappearing. A New Wake County CSA Is Helping Stem the Tide. *Indy Week*. Available online: <https://indyweek.com/food-and-drink/rafi-faith-and-farms-partnership-project/> (accessed on 31 March 2021).
44. Yeoman, B. In North Carolina, Pandemic Prompts Farmer Cooperation. *Fern’s Ag Insider*. Available online: [https://thefern.org/ag\\_insider/in-north-carolina-pandemic-prompts-farmer-cooperation/](https://thefern.org/ag_insider/in-north-carolina-pandemic-prompts-farmer-cooperation/) (accessed on 18 March 2020).
45. Garner, J.A.; Jilcott Pitts, S.B.; Hanson, K.L.; Ammerman, A.S.; Kolodinsky, J.; Sitaker, M.H.; Seguin-Fowler, R.A. Making community-supported agriculture accessible to low-income families: Findings from the Farm Fresh Foods for Healthy Kids process evaluation. *Transl. Behav. Med.* **2021**, *11*, 754–763. [CrossRef] [PubMed]
46. Ulrich, N. Supporting Local Food During COVID-19. *NC Cooperative Extension*. Available online: <https://wake.ces.ncsu.edu/2020/04/supporting-local-food-during-covid-19/?src=rss> (accessed on 28 April 2020).
47. Wholespire (N.D). Food Desert Neighborhoods in Greenville Impacted by COVID-19, Increased Food Insecurity. *Wholespire Website*. Available online: <https://wholespire.org/food-desert-neighborhoods-in-greenville-impacted-by-covid-19-increased-food-insecurity/> (accessed on 26 April 2024).
48. Garr, R. Feed Louisville: Chefs Fight Local Houselessness with Food and Resources. *Leo Weekly*. Available online: <https://www.leoweekly.com/2023/04/feed-louisville-chefs-fight-local-houselessness-with-food-and-resources/> (accessed on 19 April 2023).
49. Spence, C. Food Insecure in Kentucky? Not If UK Cooperative Extension Has a Say in the Battle against Hunger. *Northern KY Tribune*. Available online: <https://nkytribune.com/2020/07/food-insecure-in-kentucky-not-if-uk-cooperative-extension-has-a-say-in-the-battle-against-hunger/> (accessed on 19 July 2020).
50. Leimkuehler, M. Brad Paisley, Kimberly Williams-Paisley Open Free Grocery Store: ‘We Needed to Feed People More than Ever’. *The Tennessean*. Available online: <https://www.tennessean.com/story/entertainment/music/2020/05/22/brad-paisley-kim-williams-paisley-the-store-nonprofit-free-grocery-store/3099446001/> (accessed on 21 May 2020).
51. Hance, M. Second Harvest Food Bank Struggles with ‘Unprecedented’ Demand from Tornado, Coronavirus. *The Tennessean*. Available online: <https://www.tennessean.com/story/news/local/2020/05/01/demand-second-harvest-bank-spikes-coronavirus/3032439001/> (accessed on 1 May 2020).
52. Freshspire. Addressing Food Insecurity during & after COVID-19: Grassroots Organizers, Technology, & Data. *Freshspire Website*. 2023. Available online: <https://www.getfreshspired.com/wakecountycovidrelief> (accessed on 26 April 2024).
53. Edwards, S. The Black Farmers’ Hub Plants Nourishing Roots in the Food Desert of Southeast Raleigh. *Indy Week*. Available online: <https://indyweek.com/food-and-drink/black-farmers-hub-southeast-raleigh-food-desert/> (accessed on 9 September 2020).
54. Downs, J. West Louisville FoodPort Canceled. *Louisville Courier Journal*. Available online: <https://www.courier-journal.com/story/news/local/centralwest/2016/08/17/west-louisville-foodport-canceled/88906080/> (accessed on 17 August 2016).
55. USDA AMS. Transforming the US Food System. USDA AMS. 2022. Available online: <https://usda.exposure.co/transforming-the-us-food-system> (accessed on 26 April 2024).
56. USDA AMS. USDA Regional Food Business Centers Program. USDA AMS. 2023. Available online: <https://www.ams.usda.gov/services/local-regional/rfbcp> (accessed on 26 April 2024).

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