Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Pivoting is exhausting: A critical analysis of local food system resilience

Dr Carly Nichols a,*, Dr Brandi Janssen b, Cassidy Beamer c, Callie Ferring d

a Department of Geographical and Sustainability Sciences, University of Iowa, 312 Jessup Hall, Iowa City, IA 52242, USA
b Department of Occupational and Environmental Health, University of Iowa, S329 College of Public Health Building, Iowa City, IA 52242, USA
c 911 E Washington St Apt 4, Iowa City, IA 52240, USA
d 2200 Orchard Pl #A06, Fort Collins, CO 80521, USA

ARTICLE INFO

Keywords:
Local foods
COVID-19
Food system resilience
Emotion
Moral economy
Community supported agriculture

ABSTRACT

As COVID-19 caused severe disruptions to global supply chains in March 2020, local and regional food producers were widely heralded for their flexibility in adapting and ‘pivoting’ to meet changing market demand amidst public health protocols in ways their behemoth agri-food counterparts could not. While “resilient food systems” have become both an academic buzzword and a practical goal for urban and municipal planners, there is an emergent critical literature that calls for greater attention to questions of power within discourses on resilience. This article contributes to a more critical geography of food system resilience through analyzing the experiences of local food producers and meat processors in the state of Iowa, U.S. during the early pandemic period using a moral economy framework. We argue that while the small-scale, producers who market direct-to-consumer may show resilience in their ability to cope with and adapt to system shocks due to short supply chains and social relations, their uneven experience with socio-emotional and economic ‘costs’ of resilience merits increased attention from both academics and policymakers. The ethic of ‘hustle’ within farming, along with the greater social ‘embeddedness’ of market transactions in local food, invites a certain self-exploitation that is differentially enacted and experienced based on factors such as age, gender, health status, and their level of dependence on farm income. Our conclusions suggest that any policies focused on strengthening local and regional food system resilience need to also focus on the wellbeing of local food producers and promote policies towards dignified and remunerative work.

And, you know, pivot was the word of the year, obviously. But I think sometimes people don’t realize how much extra time it takes to pivot ...

So, yeah, it was exhausting. (Interview 11).

I mean I’m not being dramatic about it. It was probably my – it was my worst market season as far as how I felt about it. I almost got out of the business because I just didn’t want to deal with that anymore. It was getting to be too much. (Interview 2).

1. Introduction

Local and regional food systems (LRFS) have emerged in force since the 1990s due to consumer desires for safe, fresh, high-quality foods and a ‘know your farmer’ ethic that fosters reinvestment into local economies (Martinez et al., 2010; Low et al., 2015). While only representing around 4% of all agricultural sales in the United States in 2017, direct marketing and intermediated marketing within LRFS has been steadily growing over the past two decades (Low et al., 2015; Martinez et al., 2021). In the wake of panic buying and fears around global food supply early in the COVID-19 pandemic there was a surge of interest in local food from consumers as institutions and restaurants shut down (Westervelt 2020). This reshuffled demand was a ‘stress test’ on the food system, and early evidence from across North America suggests that producers who market their goods directly to consumers (e.g., farmers markets, farm stands, and community supported agriculture) or through intermediated channels (e.g., food hubs, institutions, or retail) had several key advantages that allowed them to quickly adapt to COVID-related shocks (Marusak et al., 2021; O’Connell et al., 2021; Schreiber et al., 2022; Thilmany et al., 2021).

In particular, the literature suggests three main reasons why LRFS...
systems may be more resilient – or able to adapt to disruption – than conventional systems. First, because producers are small and supply chains short relative to those in conventional food systems, early work shows that LRFS actors were able to quickly reconfigure protocols to adapt to the evolving impacts from COVID (Marusak et al., 2021; Thilmany et al., 2021). Second, LRFS are diverse in types of products produced and marketing channels that are used. Because of functional redundancy where many actors producing similar local food is sold through multiple channels, these diverse portfolios are better able to weather external shocks. Third, a key argument of LRFS is that they are distinct from globalized food chains because of their high (er) degrees of ‘social embeddedness’ and the presence of a ‘moral economy’ (Galt 2013; Hinrichs 2000; Janssen 2010; Jarosz, 2011; Schoolman et al., 2021). This means that market transactions between producers and consumers are not based solely on rational economic calculus that seeks to maximize self-interest, but that they are mediated by social relations and values of fairness, justice, and, in some cases, risk-sharing. The sociology of local food – the fact that a good deal of market transactions are fostered through social relations, networks, and collaborative partnerships – was seen as a boon in the face of COVID-19-related upheavals as actors were able to work together to improvise in ‘jazzy’ ways (cf. Mars and Schau, 2019) and made these local systems more resilient (O’Connell et al., 2021; Schreiber et al., 2022). The short, decentralized, and diverse chains that comprise local food, along with the higher levels of social embeddedness, demonstrated that local food systems are adept at resilience – or bouncing back from and adapting to external shocks to the system (see Tendall et al., 2015).

While our data from food producers in Iowa’s local and regional food system resonates strongly with these studies’ findings, we argue it is but a partial picture of local food system resilience in the early pandemic period. Overlooked in these celebratory narratives of local food resilience are the embodied experiences of being ‘resilient’ and the physical, emotional, and mental toll that was placed on local food actors in different ways. Analyzing data from a survey of 100 local food producers and 25 small-sized meat processors along with in-depth interviews with 25 of these individuals, this paper engages with calls for a more critical view of resilience to understand the ways that being resilient as a system comes at a (sometimes steep) cost to the individuals that comprise said systems (c.f. Cretney, 2014). Deploying the concept of a moral economy, we build on Galt (2013) to contend that the moral economies within local food do indeed ‘cut both ways’. While LRFS producers and processors demonstrated ethics of hustle and resilience in meeting the reshuffled demand in the early pandemic, the socio-emotional toll this took on many cannot be overlooked. Further, it is certainly not “sustainable” given that many LRFS producers already receive very low financial returns on their own labor (Ekers et al., 2016; Galt 2013). Our analysis highlights three themes as central to understand the socio-emotional costs of resilience: the stressful uncertainty and moral dilemmas of navigating the early pandemic, the exhaustion of figuring out protocols while coping with COVID-19’s politicization, and the complex frustration with surging demand, the fickle consumer, and the structural disparities LRFS producers have long faced in competing with cheap food. Although COVID-19 did not produce these tensions within LRFS, it did exacerbate them, and we contend that highlighting the emotional, physical, and mental wellbeing of actors in the food system is central to fostering a more vibrant, just, and resilient LRFS. This is particularly true amidst an aging agricultural workforce and a recognized need to encourage and support (care) beginning farmers – who disproportionately participate in LRFS (Carlisle et al., 2019).

This paper proceeds in four parts. Section two outlines the conceptual framework, which uses a critical lens to examine food system resilience through the concept of a moral economy. Section three outlines the study site and methods. Section four presents the empirical analysis that focuses on the ways producers enacted resilience in uneven and emotional ways. Section five concludes by outlining ways that policymakers, publics, and LRFS advocates might center producer wellbeing within agendas for revitalized and resilient LRFS.

1.1. The moral economies and resilience of LRFS

COVID-19 represented a major shock to both global and local and regional food systems, the full effects of which are still emerging (Béné, 2021). In the wake of this ongoing shock, much research has emerged that assesses the ways that food systems at multiple scales did or did not demonstrate resiliency, or their ability to withstand and adapt to ensure stable supplies of accessible food. Scholars contend that in human-created systems, such as food systems, resilience not only encompasses the ability to persist through and adapt to system shocks but to also transform systems into more desirable states (Hodbod and Eakin, 2015; Tendall et al., 2015). While research on how the ongoing COVID-19 pandemic might spur food system transformation is unfolding as we write, in this article we focus on the early pandemic (Summer, 2020) and the persistence and adaptive aspects of resilience.

Researchers posit that LRFS had a distinct advantage in being resilient over their vertically integrated and oligopolistic global counterparts that tend to specialize and use principles of comparative advantage and economies of scale to produce food for low cost. For example, Thilmany et al. (2021: 88) argues that because “local food systems are relatively nimble and proximately connected to their supply chain partners, local food enterprises can innovate quickly and with a more targeted approach, e.g. they are dynamic.” The proximal nature of economic transactions in shortened supply chains enables greater degrees of social accountability, trust, and mutual obligation between buyer and seller. Moreover, the plethora of actors in LRFS and the multiple connections between them has meant that collaborations are a “key theme” that traverse these systems (Low et al. 2015), and enabled successful adaptations to COVID-19. Jones et al. (2022) analysis of LRFS resilience in the UK context centers the role that social capital plays, which they understand as an “umbrella concept” that includes social, political, and cultural relations. Other work (O’Connell et al., 2021, Marusak et al., 2021) also emphasizes how social relationships and collaborative potential were central in successful LRFS responses to COVID-19. Even prior to COVID-19, scholars used the interrelated concepts of social embeddedness, moral economy, and social capital to understand the logics of participating in LRFS, where pure economic rationalities for self-interest maximization are tempered to varying degrees by values that emphasize community engagement, trust, reciprocity, and, in some cases, shared risk (Hinrichs, 2000; Leiper and Clarke-Sather, 2017; Hedberg et al., 2020). Research has also long pointed to the important educational function that LRFS plays, with support agencies and individual farmers spending considerable time engaging publics to teach them aspects about the regional foodshed and connect them to communities (Lyson, 2002; Janssen 2010).

Yet, important research has provided nuanced analyses of how the presence of a moral economy “cuts both ways,” or that there is a “dark side” to high levels of social capital. For example, Galt’s (2013) research on CSA farms finds that while consumers may be willing to pay a price premium to eat local food and support local farmers, producers also feel an obligation to meet customer expectations and will engage in self-exploitation to fulfill what they see as the moral duty to provide a certain amount of produce at a price point. The presence of competition from other local producers creates a process that erodes logics of social solidarity and moves local food towards conventional capitalist markets where producers set prices that do not adequately compensate the social and ecological costs of production, but instead focus on securing market share. Galt (2013) argues that by internalizing the externalities placed on environment and labor in conventional food networks, ecologically-minded producers often find themselves cutting into their own wages and self-exploiting to meet customer expectations and price competitively. He argues that while LRFS are often envisioned as an alternative to de-embedded capitalist food systems, they are inextricable from larger capitalist logics and cannot be analyzed in isolation from
Bryant and Garnham (2014) further build on the concept of moral economy to argue that transgressions in these social relations – either from the state or buyers/consumers – can cause significant stress to producers and cause them to question the fairness of their occupation or willingness to continue. They situate the broader issue of farmer mental health as emanating from broken bonds within moral economies that involve the state and commercial buyers. While focused more on commercialized producers, the analysis has much resonance for direct-to-consumer producers and speaks to Galt’s (2013) larger analytical point that producers must be growing for non-economic motivations to sustain above-average levels of self-exploitation. This highlights the critical importance of maintaining social relations and norms to make local food production ‘worth it’ for producers to continue producing for relatively low profit margins.

Thus, while the small farms, short supply chains, high diversity and connectivity and presence of sociality and moral economies may confer resiliency to the system as a whole, we argue that this performance of resilience may not be sustainable due to uneven non-economic and economic tolls it places on producers. Our analysis contributes to the literature examining LRFS resilience in the era of COVID by highlighting the uneven ‘costs’ that resilience places on producers.

2. Methods and study site

Iowa is a unique context in which to study LRFS as it is dominated by conventional agriculture operations that specialize in corn/soybean row crops, hog, egg, and (to a lesser extent) cattle production (NASS 2017a). While agriculture and allied industries are the dominant economic sector in Iowa, the LRFS has a smaller, but consistent, footprint (Janssen 2017). According to 2017 USDA Census of Agriculture (CoA) of Iowa’s 85,000+ producers, there are 2575 who market their products (inclusive of value-added products) directly to consumers and 558 who market directly to institutions (e.g. hospitals, schools, restaurants). The volume of local food sales was modest, with $11.35 in sales/per capita ($6.33 direct to consumer and $5.02 to institutions and retail) in 2017, which ranked Iowa 36th in terms of per capital local food sales (NASS, 2017b).

As of 2020 there were approximately 250 functioning farmer markets statewide, along with over 100 on-farm produce stands and 111 registered community supported agriculture vendors. As a predominately rural state, the majority of farmers markets are small yet there are 8 in larger urban areas such as Dubuque, Des Moines, or Iowa City. There are also 8 operational food hubs, which help to facilitate farm to school sales along with other institutional and household purchases (Janssen 2017).

To construct our survey sample frame, we identified producers via the Iowa Department of Agriculture and Land Stewardship’s (IDALS) registry of farm stands and the Iowa State University (ISU) registry of community-support agriculture producers. We additionally extracted producer names, addresses, and emails from publicly available regional directories of local food producers. We also emailed farmer market managers for larger regional farmers markets in the state to ask them to pass the survey to producers. The surveys were distributed using the Dillman Tailored Design Model in three waves. The first wave was an email invitation with link to the Qualtrics survey, and was followed by a reminder email the following week. We then sent a print copy of the invitation and survey packet to non-responders, which was followed with a postcard. Survey distribution took place December 2020–February 2021, and respondents received a $15 incentive for completing the survey. In total we distributed the survey to 310 producers and received 112 responses for a response rate of 36%, which is in line with other research using mail-out surveys to farm populations (Gläss et al., 2019). After cleaning the data, we discarded 13 surveys that were either incomplete or from producers who were not selling directly to Iowa consumers or institutions. We thus retained 99 surveys for analysis after cleaning and checking for completeness.

The survey asked about COVID’s impact, the producers’ response, and basic demographic information. We asked producers demographic details (age, gender, race/ethnicity, experience) as well as basic information about their farm operation (tenure, income, size in acres, crops/animals raised, marketing channels) along with questions on how COVID-19 impacted their farm operation and how they responded. The survey also included a box respondents could check if they wished to participate in a follow-up telephone interview.

We contacted a purposive sub-sample of these survey respondents (n = 27) to try and reach maximum diversity in terms of producer location, production types, and market channels used. The semi-structured interviews were designed to elicit producers’ experiential and nuanced account of the ways COVID-19 impacted their operation and the means they took (if any) to respond. The interviews were crucial to unpacking the lived experience of being an LRFS producer in the 2020 market season and are the principal source of data in this analysis.

3. Analysis

In this paper we present descriptive statistics from the survey data in terms of demographic and operation-specific characteristics as well as key COVID-impact data. To help interpret these data, we analyzed interview data and qualitative survey responses using open-coding where we read through the body of data and took detailed notes on emerging themes. We compared notes and developed a series of codes to categorize dominant themes. We then examined the variability within the themes and related this back to descriptive findings from survey data. The following results report out key headline data points from the survey and contextualizes them through qualitative analysis.

4. Findings

Our survey respondents are a good representation of LRFS producers across Iowa, as their geographic spread, demographic characteristics (age, race/ethnicity, experience, and land ownership status), and farm acres are close to the distribution reported in the 2017 USDA Census of Agriculture on producers selling direct-to-consumer (DTC) in the state (Tables 1 and 2).

LRFS producers in the Census and our sample tend to be older, more experienced, and full landowners: over 50% of our survey respondents were over the age of 55, and 30% were over the age of 65. The large majority (70%) of our sample had farmed more than ten years. Reflecting the deeply racialized patterns of land ownership in the US due to historical dispossession of indigenous lands and racist policies in agriculture (Horst and Marion 2019), the vast majority (98%) of our survey respondents identified themselves as white. While this percentage reflects the broader state population, the racial homogeneity of our sample is a major limitation of this study. In terms of farm sales, however, we had a greater number of producers who had large enough sales volumes to derive a significant portion of their income from farming, which is significantly different than the state population where over half of producers sold less than $10,000 in agricultural products in 2017.

The survey and interview respondents demonstrated high levels of pre-COVID-19 production diversity, both in the types of products they sold and the outlets they sold through (See Table 3). Two thirds of respondents were diversified vegetable producers, and just over half had some type of livestock. Approximately one-third of the sample was highly diversified, marketing vegetables or fruits, animal-source products, and also value-added goods. Respondents reported using a median number of 3 market channels to sell products prior to the pandemic.

---

1 This included Healthy Harvest of Northern Iowa, SW IA Food & Farm Initiative Local Food Guide, Iowa Beef Industry Council Local Beef Guide, Practical Farmers of Iowa Local Food Directory, Eat Greater Des Moines.
4.1. Adaptation, resilience, and stress in the pandemic

While 60% sold through farmers markets, 30% of respondents sold some product through CSA shares and on-farm sales as well.

### 4.1. Adaptation, resilience, and stress in the pandemic

In asking survey respondents to rate their level of concern about COVID’s impact on their operation, we found that more people were

Table 1

| Region (USDA Crop Reporting Districts) | Study sample (n = 99) | Interview sub-sample (n = 27) | DTC, Iowa (n = 2575) |
|---------------------------------------|-----------------------|------------------------------|----------------------|
| Northwest                             | 8%                    | 4%                           | 6%                   |
| North-central                         | 13%                   | 11%                          | 10%                  |
| Northeast                             | 18%                   | 19%                          | 15%                  |
| West                                  | 11%                   | 11%                          | 9%                   |
| Central                               | 17%                   | 15%                          | 18%                  |
| East                                  | 14%                   | 19%                          | 17%                  |
| Southeast                             | 12%                   | 19%                          | 6%                   |
| Southcentral                          | 2%                    | 12%                          | 2%                   |
| Southwest                             | 3%                    | 10%                          | 3%                   |
| Farm Size (Acres)                     |                       |                              |                      |
| < 10 acres                            | 31%                   | 37%                          | 35%                  |
| 10–49 acres                           | 32%                   | 37%                          | 32%                  |
| 50–99 acres                           | 8%                    | 7%                           | 9%                   |
| 100–179                               | 7%                    | 8%                           | 8%                   |
| 180–259                               | 4%                    | 7%                           | 4%                   |
| 260–499                               | 4%                    | 4%                           | 6%                   |
| 500–999                               | 6%                    | 5%                           | 5%                   |
| >1000                                  | 6%                    | 4%                           | 2%                   |
| Land ownership                        |                       |                              |                      |
| Full owner                            | 60%                   | 70%                          | 67%                  |
| Tenant                                | 11%                   | 15%                          | 11%                  |
| Part owner                            | 29%                   | 15%                          | 22%                  |
| Employee                              | 1%                    | –                            | –                    |

While 60% sold through farmers markets, 30% of respondents sold some product through CSA shares and on-farm sales as well.

### 4.1. Adaptation, resilience, and stress in the pandemic

In asking survey respondents to rate their level of concern about COVID’s impact on their operation, we found that more people were

Table 3

| Type of Production Mix | Survey (n = 99) | Interview sub-sample (n = 27) |
|------------------------|----------------|------------------------------|
| Crops only (DTC)       | 28%            | 33%                          |
| DTC crops + livestock  | 11%            | 19%                          |
| DTC crops + value-add  | 10%            | 11%                          |
| DTC crops + livestock + + value-add | 10% | 11% |
| DTC crops + grain/forage + livestock | 8% | 7% |
| DTC crops + grains/forage + livestock + value-add | 6% | 4% |
| Livestock + grains/forage | 15% | 11% |
| Only livestock         | 11%            | 4%                           |
| Marketing channels used prior to COVID-19 |
| Farmers Market         | 65%            | 52%                          |
| On-Farm Stand          | 43%            | 33%                          |
| Community supported agriculture shares |
| Wholesale sales (grocery) | 32%         | 22%                          |
| Restaurant sales       | 27%            | 30%                          |
| Institutional sales    | 18%            | 19%                          |
| Online                 | 17%            | 15%                          |
| Other                  | 17%            | 19%                          |
| Avg Market Channels    | 2.5            | 2.9                          |

Table 4

| Level of agreement with statement: I am concerned with how the COVID-19 pandemic has impacted my: | overall agricultural operation over the last 6 months | income from my agricultural operation over the last 6 months |
|-----------------------------------------------|-----------------------------------------------------|------------------------------------------------------|
| Strongly agree (high concern)                 | 25%                                                 | 15%                                                  |
| Somewhat agree                                | 33%                                                 | 31%                                                  |
| Neither agree nor disagree                    | 20%                                                 | 29%                                                  |
| Somewhat disagree                              | 10%                                                 | 8%                                                   |
| Strongly disagree (low concern)               | 11%                                                 | 16%                                                  |

more concerned about COVID-19’s impact on their operation as a whole (e.g., concerning supplies, employment, markets) (58%), than on their farm-related income in particular (46%) (Table 4).

This makes sense since two-thirds of respondents also reported increased demand or even having record-setting sales years. While those that sold large volumes to restaurants or very specialized production reported losses, the majority of survey respondents noted that people were now more interested in “connect [ing] with local food” and the increased number of people cooking at home drove up product and meat sales. It is notable that despite having such strong sales years, there were still many who reported being quite concerned about COVID impacts due to the stress, exhaustion, and anxiety many endured in trying to navigate the sudden challenges and opportunities that COVID brought.

Producers enumerated several innovative strategies to adjust to pandemic circumstances including more aggressive marketing, offering online no-contact ordering, or increasing their contributions to food security and access efforts. Those who did on-farm sales or CSA shares explained how they reconfigured the entire protocol for customer interaction to maintain safety while also making room for new customers. Interviewees spoke about how partnerships with other farms allowed them to “fill product gaps” in their CSA shares and dramatically expand CSA size (interview 8, 25, 26). Many producers also reported different actions to help support their community given unprecedented job losses, business closures, and sickness that emerged in summer 2020. While 50% of producers reported increased costs of production due to

While 60% sold through farmers markets, 30% of respondents sold some product through CSA shares and on-farm sales as well.
additional sanitation and packing material the pandemic required, only 30% passed on some of this price increase to their customers. Producers were clear they knew “folks were struggling” so resisted price increases. For those who did raise prices due to increased costs of canning supplies, for example, they said they did so ever so slightly so they could just “squeak by”. Moreover, while many were already taking actions to improve food access, 8–10% of producers surveyed started donating or discounting food or accepting SNAP/WIC as payment in 2020. Others spoke about directly contacting senior centers to make sure that residents could still use their senior assistance farmer market checks despite being in isolation.

While there was much in respondents’ survey responses and interviews that spoke to the ‘resilience’ and ‘nimbleness’ of local food producers drawing on long-cultivated relationships with producers and customers to quickly pivot to meet pandemic-related challenges, this is only a partial picture of the larger story. Respondents also expressed a high level of concern about the broader impacts of the pandemic on themselves and their families, emphasizing the physical, mental and emotional toll it took on them to reimagine their entire business model under stressful, uncertain, and sometimes hostile conditions. Over half (52%) of survey respondents reported feeling somewhat or strongly concerned about their mental health as a result of COVID-19, and 50% said they felt concerned about how the pandemic and its reverberations would continue to impact their operation and family.

While there were many common threads across surveys and interviews, it was notable that this stress was not experienced in uniform ways and those who had children, lived with vulnerable individuals, or faced greater economic precarity had more challenges. Producers also were stressed about different aspects of the pandemic, depending on where they fell on the political spectrum, many of which spoke to anxieties over perceived transgressions in a moral economy comprised of state, society, and producers. While some producers – particularly in western Iowa – reported feeling heightened anxiety due to government “overreach” and having “public health officials tell me how to run my business,” producers in more urban areas and eastern parts of the state were anxious because of perceived transgressions from customers who refused to mask, or because they themselves did not want to inadvertently spread the virus. As producers navigated these challenges they spoke about the social relations they were embedded in using both laudatory and critical language. It seemed that the ‘moral economy’ of LRFS was both strengthened and frayed throughout the 2020 season. We highlight three themes below.

4.2. Uncertainty: the stress of not knowing and the moral dilemma

A common theme was uncertainty of navigating the early pandemic period. The pandemic started at the beginning of the 2020 growing season, when many farmers had already invested in seeds and inputs. For those that moved a large amount of product through farmers markets, schools, or restaurants, there was significant concern about the fate of their investments. For example, one producer in northern Iowa explained how they faced immediate stress at the potential loss of 50% of their income.

Our very first concern was can we even do market? And what in the world are we going to do with all the seedlings that we already got started doing? Go ahead and plant them? Do we not? Everything was just so uncertain as to whether we could even have farmers markets. And we were trying to debate Do we? Do we look at other avenues? It was just such a shock to us that we really were struggling to wrap our brains around. What to do that quickly? (Interview 22).

Prior to COVID-19 respondents managed risk in their business through diversifying their products and marketing channels because they did not have access to subsidized insurance or price risk programs like their commodity-growing counterparts (Carlisle et al. 2019). As such, external shocks such as the COVID-19 shutdown led many producers to fear the worst, particularly if they were dependent on their farm income for a large portion of their household income. Another producer explained her genuine panic in early March due to the large investments she had just made in greenhouse costs:

At that time of the year we have a ton of overhead and just with seeds and soil and propane to run the heater costs and so it was just my immediate concern was financial and then my secondary concern was ... well it was still financial. I don’t work outside of the home; this is the income that I bring in. Are we going to sell the stuff, are we going to even have opportunities to go to farmers markets? (Interview 18)

Yet, the vulnerabilities to pandemic shocks were not evenly distributed and some households had less latitude to aggressively pivot or even imagine what that might look like. Interview respondent #22, quoted above went on to explain that while they feared what to do about the potential for market closures, they also had an immunocompromised child at home that made them question whether it was even prudent to go to market if it did open.2

The stress of additional caretaking tasks and/or worrying about immunocompromised or elderly individuals in the household was another significant theme that permeated producers’ early pandemic experience. One beginning producer recalled the challenges when her young kids came home from spring break and never went back:

I’d always sort of planned my farm work week around their school schedule, because I knew I could get, you know, whatever that was - five or six solid hours of mowing or harvest or whatever. That was one of the bigger hits - was finding enough time. Early spring on the farm, especially a farm as new as mine, I don’t have a lot of income yet, so I’ve got off farm work that’s vital for keeping the lights on in the house. (Interview 10)

Many other producers spoke about the stress they felt in not just managing risk for their business, but in making ethical judgements about whether it was even safe to continue to interact with customers. Several interviewees said this weighed heavily on them as they considered their options for the 2020 seasons. One producer stated:

Our immediate concern was to try to keep our family and our employees safe as possible, as well as our customers. And I mean, that was one thing we talked about, whether we should even be going back to farmers market, even when it did actually start up. (Interview 6)

The moral dilemma of whether to continue serving customers or pivot away from the farm was not a decision that individuals took lightly. Another producer recalled:

as soon as we started seeing the pandemic and hearing the reactions, I knew we were going to be in trouble. Because I’m not willing to risk people’s health for my own well-being. Shucks, for my own business’s well-being is maybe a better way of putting it. And technically, we could have gotten by just with [my partner’s] off-farm income. You know what I mean? (Interview 21)

This interviewee went on to lament that though the decision to scale their produce production way back was “obvious”, “it doesn’t mean we liked it, it doesn’t mean it was comfortable” and they honestly worried they might be “forsaken” by their community for reneging on food provisions. They conscientiously decided to keep producing the same number of poultry and eggs for customers despite not needing the income, saying “if you want to keep doing this [farming], you can’t just hide in a hole the whole year from during the pandemic and then pop

---

2 Among survey respondents, 30% reported increased caretaking duties as the pandemic took course. Interestingly, this was both boon and bane for producers, with some others reporting it was useful to have kids or grandkids home and an extra set of helping hands.
back out, like ‘Oh, we got food for you again.’ You have to find a way to keep people engaged. Get them what you can”. Reflecting an adherence to the moral economy they operated in, respondents considered more than the imperative to maximize profit/minimize loss in deciding how to respond to COVID-disruptions, but also factored in their self-perceived dual responsibilities to provide food to communities and also keep both employees and customers safe.

“Those weighty questions around producers’ responsibility to provide their communities food while also keeping everyone safe were exacerbated by the highly politicized tone that COVID-19 was taking in the US and what producers described as a somewhat chaotic onslaught on information and guidance they did not always have time to read.

4.3. Exhaustion: figuring out protocols and COVID politics

Indeed, a second theme that emerged was the sheer workload that many producers took on as they attended to normal spring tasks, while also taking major steps to reconfigure marketing strategies. This was complicated by the messy information ecosystem and that there was no “one-stop shop” for information on everything from public health guidance to government assistance (interview 6). Resultantly, many producers reported just working doubly hard to “figure it out for themselves”, while also responding to the highly variegated public health response to COVID that was unfolding across Iowa.

While some operations moved quickly to set up online storefronts or shift to CSA sales, not all producers were able to make such adjustments either for lack of time/ability to tackle virtual sales or because they were not diversified enough to offer CSA shares. The technology divide was a clear theme as many producers felt ill-equipped to move to online storefronts or felt the range of third-party options did not always meet their needs. This was exacerbated as Facebook – an easy option for many – also began cracking down on the sale of agricultural products (e.g., eggs, meat, vegetables) on its Marketplace site in spring 2020 (interview 8). One beginning producer explained their decision to not move sales online as lack of time to handle labor intensive planting season while also figuring out technology. They explained:

We did a lot on Facebook, and we did have a website, but it was super old and outdated. Like I said, we are just a single family. And my husband works outside the home, and I’m not super, super technology-savvy. (Interview 18)

Additionally, many producers had to rethink their protocols for customer interaction factoring in their own risk tolerance and that of their customers. The producer above stated that despite having the best sales year ever, there was extreme stress in rethinking how individuals would buy plants out of their greenhouse in a safe way that respected customers’ different levels of risk tolerance around COVID. They said:

It was hard, trying to balance all of the different [customer] needs, and then the protocols and then what the government, you know…. I mean, the amount of workload that our family endured last year was a was a huge challenge, just for the family unit. (Interview 18)

For those that operated CSAs, many also had to quickly reimagine how to safely interact with customers and realized that COVID precautions created much more labor. One producer explained that it was significantly more work to move from the previous ‘buffet’ style-set up at the farmer’s market when they had to pivot to creating pre-packed bags that they loaded directly into vehicles, calling this process “exhausting.” Because producers felt greater responsibility to meet customer comfort levels and keep people safe, the labor burdens increased substantially. Due to low profit margins along with a larger issue of finding quality employees in LRFS spaces (e.g., see Bruce and Som Castellano, 2017), most producers internalized these higher labor requirements within their own family rather than hire new employees. Yet, while nearly all producers agreed that modified CSA pickups on-farm stands were more labor and higher cost than before, yet few reported stresses in interacting with customers like were observed with farmers selling through farmers markets.

4.3.1. Farmers markets

Indeed, for those who relied on farmers markets, the challenges largely depended on the site, given the wide range of COVID-responses across the state. Many at bigger, urban markets expressed distress, albeit in different ways, over the lack of communication they received from market managers or how unilateral decisions were taken to pivot online without consulting the vendor base. One producer stated:

From my perspective, [farmers market management] decided to do an online market without talking to a single farmer. It was more or less they were like, ‘we need to support our farmers, we should make an online platform’. They did not say “we need to support our farmers, ‘hey, farmers, what do you need to feel supported?’” Which is baffling to me. Especially when you are paid staff with benefits, supporting people who like, aren’t on salary with benefits, just very weird. I was really upset, very upset. (Interview 7)

Other farmers were upset with farmer market management for taking too long to decide on whether they would open or not. One producer in western Iowa said that the event management company in charge of one of their main markets was “very sensitive to the impacts of COVID” and continued.

That’s fine, but don’t take it out on the rest of us …. The biggest frustration we’ve had with COVID is the forces that slow you down are usually pushed by people who work for a salary that is not based on performance and we are self-employed people. (Interview 25).

The producer continued that it caused them “anxiety to not be able to do what you want to do”. The conflicts and frustration with market management illuminates a larger distress felt by LRFS producers, that their livelihoods are dependent on decisions made by those in salaried jobs. The COVID-spurred irritation with farmers market management in urban areas indexed what seemed to be long-simmering frustration with steep fees and rigid policies around set-up and take-down timings at markets. Here too, producers felt there was a fracturing of the moral economy, where many producers felt these entities running markets that were supposed to facilitate transactions had usurped too much power in dictating the ways they interacted with customers. For some produce vendors who had sold at urban markets for years, they felt emboldened to sell without attending the market. One producer selling at a major market in Eastern Iowa stated:

Well, first of all [redacted] farmer market management irritated me because we were one of the very first vendors that we were there from day one ….And they basically told us well, you don’t do it our way (go online) or you’re out. And I bet there’s probably five of us that will not be going back to that market. They’ve lost their anchor produce, and they don’t care. (Interview 2)

Others were similarly annoyed by the rigid time requirements that online markets required, saying it was not worth their time to sit there for 4 h for a small amount of pre-order sales (interview 14).

The politicization of mask-wearing in summer 2020 trickled over onto producers, no matter where on the masking spectrum they fell. While all interviewees complained about wearing masks in the hot, humid summer months, many reported doing it to either set a good public health example or because they did not want to lose customers. Interestingly, in many more politically conservative parts of the state, vendors received pushback from both sides of the spectrum. One producer said that while their partner was not “overly sold on the mask idea,” they decided to wear them at market because that is what they thought “customers want to see”. Nonetheless they reported there were still people that told them “you know, because you’re wearing masks, I’m not gonna support you”, but that there were more people saying “because you wear a mask you know we will support you” (Interview 14). Other respondents reported feeling fearful for their personal safety,
noting in the survey they were concerned about their stress levels and mental health because “most Iowa residents did not wear masks at farmers markets in the 2020 season” (R-9, survey), while others felt more saddened by the divisiveness writing, “people are scared and divided, which is really sad” (R-34).

In larger markets with formal mask mandates, vendors reported more hostile situations at times, which some said made them question their desire to even stay in the business. One producer who sells at eight different markets every week lamented how emotionally exhausting markets became in 2020:

“They didn’t want to peruse the market, it wasn’t fun anymore, you had to wear a mask at market. You have to sanitize you have to not touch the produce—which was extremely hard—hard on us and hard on our customers … And they were angry because people are angry because they.head to wear masks. I had a lady stand in front of my booth for 10 minutes, pull up the HIPAA Act on her cell phone and proceeded to read me the act of how I was violating HIPAA rights. My! And I never said anything, the market mandated the masks. Oh, [the vendors] caught it. (Interview 2) ”

While this producer experienced negative customer interaction over the 2020 season, and felt the social norms of the moral economy had eroded with the politicization of COVID -precautions, it was quite interesting that many producers selling in smaller rural markets expressed renewed optimism over more people showing appreciation for local food. These producers who sold at smaller markets – often run by volunteers – were also more appreciative of whatever management did either in providing handwashing stations or going extra lengths to let customers know they were open. One producer from Southwest Iowa said they continued going to three small markets per week and that customers remained “fiercely loyal” which led them to have their best season ever. They argue, their experience was likely shaped by the rootedness of her business and the relationships they cultivated with the small-town farmers markets, peppering their interview with reminders “again relationships are so important” and speculating, perhaps smaller communities have been able to weather the storm better than some larger communities where people maybe don’t have some of those relationships with business owners (Interview 5)

Despite the positive experience with customers and the intimate settings at markets, even these producers were not spared from pandemic stress, as this participant ends the interview stating:

“it was a very stressful year. I I’m not gonna lie with that. And we spent that the month of April and May and even going into June, I’m not sure that my husband slept a full night. Any of those nights it really worried him. He wasn’t sure how it was going to work. (Interview 5) ”

They go on to comment that one of the vendors became quite sick with COVID midway through the summer and so the other vendors sold his produce on their behalf, but that it introduced another level of stress to the market season and that both she and her partner started blood pressure medication in the past year.

It is striking that even among producers who reported doubling sales and renewed relationships with communities, they still weathered an enormous amount of physical and mental stress in providing food for their communities. Here, too the issue of labor comes to the fore, as most small-town farmers markets are run by volunteer labor, which only intensified in summer 2020 as the number of willing volunteers dwindled. While some grocery chains were able to offer ‘hazard pay’ to compensate employees for additional labor and stressfulness of working in a pandemic, LRFS actors had to fully internalize these additional burdens themselves. This was firmly situated within the moral economy many felt they were operating in as almost all interviewees felt they had a ‘responsibility’ to not just provide their communities with clean, safe food, but many also said they felt responsible to mentor and cultivate a new generation of farmers.

However, many producers - especially those serving larger markets - also expressed complex feelings around their ‘responsibility’ to provide food to their community in the context of a moral economy, where responsibility and reciprocity are supposed to be relational across producer-customer nexus, often crossing through intermediary actors such as farm-to-school and food hub coordinators, grocery produce managers, and farmers market management. While many felt that core customers were central to helping them weather COVID-disruptions, there were ambivalent sentiments about the responses that farmers market management did to address the challenges as well as the ‘surges’ in demand experienced in April and May when the fears around food supply set in.

4.3.2. Frustration: the fickle consumer and structural disparities

The third theme that emerged from our data was the complex feelings producers had as new customers flocked to them in the early pandemic days. Among livestock producers, meat processors, and CSA farmers in urban areas, interviewees all reported unprecedented surges in demand as the pandemic unfolded. While they felt enthused by interest in local food, they also were frustrated by the demands being made on them that they had no ability to meet and were uncertain whether the interest would last. Livestock producers reported extreme panic-buying in the early pandemic months with some saying, “I could have tripled my business if I could have gotten locker [meat processing] dates” (Interview 15). If they were not able to provide demanded products, they also sometimes faced hostile customers. Producers and processors alike both said a lot of their time was spent:

“Just in trying to trying to educate people that just don’t have a clue. You know what I mean? They just don’t know the business. They don’t know how it works. And they just thought that they could call you from wherever, never doing business with you and get 10 head of beef or something. (Interview 23) ”

CSA producers in central and northeastern Iowa also shared how they had to create waitlists (often for the first time) to manage unprecedented demand. While some expressed this was their ‘dream’ to have only CSA and not rely on farmers markets, others felt stress in having to tell people no. This melded into greater frustration over panicked customers, some of whom producers felt were transgressing the values of solidarity embedded in the moral economies of LRFS. One producer recalled:

“People crawled out of the woodwork who are like, maybe I’ve never even shopped at the co-op. I’ve never been to the farmer’s market. But now I’m like, super concerned about what might happen. If this gets bad in whatever way, they’re thinking it’s gonna get bad and they want to know that they have food. All these people that have never supported our farm are like calling, texting, emailing, Instagram messaging, Facebook messaging. And of course, I want them in our markets. But at the point that we had like tripled the size, we did cut it off at a certain point and had a waitlist. And people were aggressive because it was like, they were like, fearful and acting from a place of fear. And I empathize with that and at the same time, I was like, ‘You’re stressing me out.’ And you’ve, we needed your support five years ago, we needed your support three years ago. And now you’re in a pickle, and you want our support. (Interview 7) ”

This producer critiqued what they saw as transaction-oriented consumers that were only now coming to local producers out of fear that conventional supply chains would not meet their needs. Producers saw these consumers as not adhering to the moral economy framework in that they were not consistent supporters of LRFS, but only accessing them when they were in “a pickle”. Moreover, other producers said that the surging demand waned as the pandemic wore on and people realized they could continue to get their food elsewhere. One producer discussed how their phone would not stop ringing early on with requests for farm-fresh eggs, leading them to tell people no because “you know, you can’t
turn your chickens on to double production when you want” but then by July “people had lost interest and gone back to their old habits” (Interview 21). Many producers felt cautiously optimistic about the prospects for interest in local food sticking around and at the same time frustrated that it took a global pandemic for people to take interest. One producer in northcentral Iowa reported that local food has never really “caught on” like it has in eastern or central Iowa and that most producers are hesitant to grow more because of poor demand. They said this started to change in 2020, which was also bolstered by last-minute state funding that came from federal pandemic relief dollars for schools to buy local produce and protein. She says, But this was like the first year where we felt like, finally there’s some traction, like people had this sudden need to find local food and to support their local businesses. And it took a pandemic, to make people change their habits. (Interview 17)

Yet producers did not place the blame solely on consumers, as many felt that the return to old habits was inevitable given the structural features of the US food system that prioritized commodity crops. One producer said that while the pandemic awakened some interest among consumers in local food, it should speak more loudly to legislators who disproportionately subsidize industrial commodity crop producers (interview 21). This point was echoed by many: until there is greater disproportionately subsidize industrial commodity crop producers

Our data similarly illustrated these structural disparities, where respondents growing row crops and cattle or with larger vegetable operations had a notably easier time accessing COVID-relief packages such as the Payment Protection Program (PPP) and the Coronavirus Food Assistance Programs (CFAP-I and CFAP-II), as they had closer relationships with both banks and their county Farm Service Agency (FSA) office. Several of these larger producers reported accessing PPP or CFAP1 and 2 as “too easy” and that free government money was “unnecessary”, yet they took it because it was available. Our survey revealed that while 70% of row crop producers (n = 30) obtained COVID relief payments and (63% received more than two types), only 39% of non-row crop farmers (n = 68) received relief payment with (only 22% receiving more than two forms). Many small-scale producers reported not even applying for payments as they were overwhelmed trying to decipher if they were eligible for these programs, or they thought “someone needed the money more than me” (interview 20). Vegetable producers that did apply most frequently stated they did so because a fellow producer directly encouraged them. While this speaks to the centrality of social relations in small-scale agriculture, it also highlights the entrenched structural disparities where large producers are more easily able to benefit from government programs than small-scaled producers due to preexisting ties with FSA and agricultural loan officers as well as a sense of entitlement to agricultural benefits.

Thus, while small-scale vegetable producers felt the pandemic allowed local food “to shine”, it is noteworthy that this increased interest was shouldered through their own increased labor, stress, and sense of moral responsibility to not just provide food but ensure public health practices. Moreover, one producer lamented that unless the structural changes were made demand would not stick around because of the job satisfaction, saying that in 2021 many will “work their tail off, and then they’re going to get to June and realize their sales aren’t what they used to be and then they’re going to need somebody to talk to.” (Interview 21)

5. Discussion and conclusion

Our study aimed to understand the ways that COVID-19 impacted Iowa LRFS producers in the 2020 market season. Our results resonate with much of the emerging literature on the topic, finding that multiple forms of social relationships – particularly with other producers, customers, and families – alongside producers’ operational size enabled them to transform their businesses to meet pandemic realities (Marusak et al., 2021; O’Connell et al., 2021, Schneider et al., 2022; Thilmany et al., 2021). Many LRFS producers spoke in laudatory terms about the partnerships with other farmers and core customers and felt energized by increased interest in local food.

Yet, we also find that such adaptation and resilience came with a cost that was largely born by producers and their families in terms of additional labor and emotional and mental distress that came from trying to ‘figure out’ how to continue providing to customers while also keeping their communities safe. While many individuals felt ‘stressed’ in the early pandemic, it is especially important to understand LRFS producers because they perform an essential service in food provisioning for which they already receive very low to non-existent profit margins. Moreover, all farmers are not equal, and while our dataset lacks racial diversity, it reveals significant disparities in how producers were able to adapt to COVID shocks. In particular, we found beginning producers and those with dependents or vulnerable individuals in their households faced additional stress at the pandemic outset due to large overhead costs, lack of operating capital, and lack of suitable risk-management tools from the USDA. Second, as producers transformed their operations to align with public health measures, they shouldered additional labor and costs when integrating additional safety protocols. While producers are already stretched thin in spring planting season, most expressing being pushed to the limit in 2020 and having significant physical stress as they navigated the usual farm challenges alongside trying to stay informed on pandemic precautions. The tendency for ‘self-exploitation’ that Galt (2013) revealed among California producers was merely pushed to greater degrees in 2020, which caused many to shoulder labor loads that caused significant stress on them and their families and likely are not ‘sustainable’.

While nearly all producers reported the increased physical burdens they had, there was also a socio-emotional stress that accrued. While many respondents spoke positively about their relationships with other producers and core customer base, they expressed frustration with an onslaught of customers who were not as interested in participating in the moral economy of LRFS, but rather reacting to early fear over food supply breakdowns. This created particular stress, as producers felt they were internalizing much more labor to serve people who would otherwise have never supported local food producers. While our data does not speak to consumer motivation some evidence suggests “the local pivot” was not as widespread among consumers as initially conceived (DuPuis et al., 2022). However, it was not just the panic but also the polarization permeating early pandemic responses that seemed to frays the social fabric of LRFS moral economies. Indeed, though anger over mask mandates has caused significant stress to frontline workers from airline attendants to supermarket checkers (Sampson 2021), LRFS producers were in a unique position given the social proximity of their customer base and the ‘embeddedness’ of their market transactions. That is, many producers were not only on the front lines of mask politics, but their own personal decisions, rules, and accommodations shaped their customer interaction and potential for future sales. The political polarization of COVID and its impact on LRFS producers is an interesting theme to emerge from the data and one that further research might explore as polarization only continues to deepen in 2022 on various issues. Some producers worried about the loss of customers due to their masking policies and future research might interrogate how political identities across rural markets shape both business transactions and opportunities for dialogue, as well as how the initial boom of consumer interest has panned out, particularly amidst persistently high COVID-spurred inflation.

For those producing for larger urban markets, we saw a fraying of social relations as producers felt excluded from key market decisions that would affect the future of their businesses. Building off Bryant and
Garnham (2014), we note many producers seemed to signal that 2020 was a tipping point for simmering unease with farmers market policies. As LRFS are increasingly moving away from pure ‘farmer-customer’ relations through intermediaries such as food hubs, market managers, and school-to-food programs, it is important to understand the moral economy as encompassing these actors as well (Janssen 2017). As many producers felt positive about their decision to not go to market, future research might explore mid- and longer-term implications that COVID-19 has had on market participation or in intermediated channels.

Producers participate in LRFS for reasons that exceed pure profit-maximizing behavior, and much work documents how participation is motivated by ethics of care for community and environment, a desire to be self-sufficient, and a desire to educate communities about sustainable food practices. For producers driven by such “alternative” rationalities, the stress of 2020 might serve as a deterrent to continued or expanded LRFS participation. Just as 2021 has been characterized by large scale reshuffling in the labor market dubbed ‘the great resignation,’ many producers morale seemed shaken from what the 2020 season had to offer as well as a renewed commitment to better work-life balance.

We argue it is important to focus on these costs, which were unevenly distributed, in order to think through how COVID can spur transformative resilience where the US food system might ‘bounce forward’ to a new and more desirable state (c.f. Hodbold and Eakin, 2015). Jones et al. (2022) use the language of social capital rather than moral economy and find that while UK producers successfully networked with one another and with customers, they lacked the ‘linking’ social capital to advocate for larger policy changes that might shift the playing field to be in favor of LRFS producers. We broadly concur with this analysis but argue that in the Iowan context it is too early to tell what larger implications the pandemic may have on LRFS. Already the Iowa legislature has passed a bill providing grants for local meat locker expansions and apprenticeship programs to address workforce development (Coltraiin 2021). The handful of food hubs in the state have also moved forward in securing grant money to set up distribution routes to move food from areas of low demand (e.g. northern Iowa) to more urban areas as a way to provide producers more market security. Statewide taskforces have sprung up across 2021 to listen to LRFS actor concerns and ideas to forge a plan for greater LRFS investment going forward using the second wave of federal pandemic relief funding (Long 2021). While much discussion has centered on increased processing capacity for not just meat but also fruit and vegetables, our study suggests that producer well-being ought to be centered in such a plan.

Given the large role that LRFS producers played in stabilizing early pandemic concerns around food supply, there is a clear need to invest more in building their capacity to respond to sudden system crises more efficiently and sustainably. Many producers felt they were not adequately consulted when key decisions around their markets were being made, suggesting the need for better bidirectional flows of communication between producers and support organizations. Given the high anxiety over financial losses in the early pandemic, the study highlights the imperative need to develop risk management products for diversified, small-scale LRFS producers who currently are not served by USDA commodity insurance. Such products would have ameliorated much panic and stress in the early crisis period, allowing producers to make core business decisions more effectively. More dedicated outreach to LRFS producers within county FSA offices would also allow for easier access to information about grants and government assistance. Third, investing in universal health care would be the bedrock to the well-being of producers and the viability of small-scale farms overall, as producers could focus more on food production and not have to maintain off-farm jobs to carry health insurance. Moreover, universal health care would allow producers to access mental health services, something that many felt would improve their ability to perform difficult yet essential work. Since many producers for LRFS are motivated by alternative rationalities that extend beyond pure profit-seeking, creating these investments is essential in equipping them to absorb increased demand in future crises, whether they be climate, pandemic, or economic related.

Credit author statement

CN: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Writing - original draft; Writing - review & editing. BJ: Methodology; Writing - review & editing. CF: Data collection - Investigation, Preliminary analysis. CB: Data collection - Investigation, Preliminary analysis. All authors reviewed the manuscript prior to submission. By submitting the manuscript to this journal we state we have not submitted this to other journals for consideration or published findings elsewhere.

Data availability

The data that has been used is confidential.

Acknowledgements

We would like to thank two anonymous reviewers for supportive and constructive comments as well as Dr. Damian Maye for editorial assistance. Also many thanks to Niki von Hedemann for a helpful review of an earlier draft, and to all the participants in the COVID-19 Regional Food System working group who helped discuss and provide early feedback on these analyses, particularly Laurel Bellante, Gigi Owen, Caela O‘Connell, and the Galt Lab Group. Most of all many thanks to all of the LRFS producers who participated in both the survey and interview components. This research was supported by University of Iowa’s Office of the Provost’s Interdisciplinary, Scalable Solutions for a Sustainable Future grant project, for which we are grateful. All errors or omissions rest with the authors.

References

Béné, C., 2021. Resilience of local food systems and links to food security – a review of some important concepts in the context of COVID-19 and other shocks. Food Secur. 12 (4), 805–822. https://doi.org/10.1007/s12971-020-01076-z.
Bruce, A.B., Som Castellano, R.L., 2017. Labor and alternative food networks: challenges for farmers and consumers. Renew. Agric. Food Syst. 32 (5), 403–416. https://doi. org/10.1017/RAT.2016.28.
Bryant, L., Garnham, B., 2014. Economics, ethics and emotions: farmer distress within the moral economy of agribusiness. J. Rural Stud. 34, 304–312. https://doi.org/10.1016/j.jrurstud.2014.03.006.
Carlisle, L., De Witt, Delonge, M.S., Galu, A., Getz, C., Ory, J., Press, D., 2019. Securing the future of US agriculture: The case for investing in new entry sustainable farmers. Elements: Science of the Anthropocene 7.
Colrain, N., 2021. Iowa meat lockers, facing yearslong backlog, targeted for help with new law. Des Moines Register. June 9, 2021. https://www.desmoinesregister.com/story/news/politics/2021/06/09/iowa-gov-kim-reynolds-signs-meat-locker-butcher r-shop-grant-law-coronavirus-covid-panic-bank/b7622508002/.
Cretney, R., 2014. Resilience for whom? Emerging critical geographies of socio-ecological resilience. Geography Compass 8 (9), 627–640.
DuPuis, E.M., Ransom, E., Worosz, M.R., 2022. Food supply chain shocks and the pivot toward local: lessons from the global pandemic. Front. Sustain. Food Syst. 6, 836574. https://doi.org/10.3389/fsusf.2022.836574.
Ekeren, M., Lenskoe, C.Z., Walker, S., Dale, B., 2016. Will work for food: agricultural interns, apprentices, volunteers, and the agrarian question. Agriculture and human values 33 (3), 705-720.
Galt, R.E., 2013. The moral economy is a double-edged sword: explaining farmers’ earnings and self-exploitation in community-supported agriculture. Econ. Geogr. 89 (4).
Glas, Z.E., Getson, J.M., Gao, Y., Singh, A.S., Eanes, F.R., Esman, L.A., Prokopy, L.S., 2019. Effect of monetary incentives on mail survey response rates for midwestern farmers. J. Environ. Stud. Sci. 5 (3), 474–484. https://doi.org/10.1016/j.jesst.2018-0280-6.
Horst, M., Marion, A., 2019. Racial, ethnic and gender inequities in farmland ownership and farming in the U.S. Agric. Hum. Val. 36 (1), 1–16. https://doi.org/10.1007/s10460-018-9883-3.

Janssen, B., 2010. Local food, local engagement: community-supported agriculture in eastern Iowa. Cult. Agric. 32 (1), 4–16. https://doi.org/10.1111/j.1556-486x.2010.01031.x.

Janssen, B., 2017. Making Local Food Work: the Challenges and Opportunities of Today’s Small Farmers. University of Iowa Press.

Jarosz, L., 2011. Nourishing women: toward a feminist political ecology of community supported agriculture in the United States. Gender, Place & Culture 18 (3), 307–326.

Jones, S., Krzywoszynska, A., Maye, D., 2022. Resilience and transformation: lessons from the UK local food sector in the COVID-19 pandemic. Geograph. J. 2021, 1–14. https://doi.org/10.1111/geoj.12428. December.

Leiper, C., Clarke-Sather, A., 2017. Co-creating an alternative: the moral economy of consumer and producer motivations for participating in farmers’ markets. Local Environ. 22 (7), 232.

Long, C., 2021. Farm to table task force makes recommendations to Iowa legislature. Iowa State Extension Press Release. Available at: https://www.extension.iastate.edu/news/farm-table-task-force-makes-recommendations-iowa-legislature.

Lyson, T.A., 2002. Advanced agricultural biotechnologies and sustainable agriculture. TRENDS in Biotechnology 20 (5), 193–196.

Mars, M.M., Schau, H.J., 2019. The jazziness of local food practice work: organization-level ingenuity and the entrepreneurial formation and evolution of local food systems. Rural Sociol. 84 (2), 257–283. https://doi.org/10.1111/rusy.12244.

Martinez, S.W., Park, T., Martinez, S.W., Park, T., 2021. Marketing Practices and Financial Performance of Local Food Producers : a Comparison of Beginning and Experienced Farmers Performance of Local Food Producers : A Comparison of Beginning and Experienced Farmers, p. 225.

Marusak, A., Sadeghianrahimi, N., Krejci, C.C., Mittal, A., Beckwith, S., Cantu, J., Morris, M., Grimm, J., 2021. Resilient regional food supply chains and rethinking the way forward: key takeaways from the COVID-19 pandemic. Agric. Syst. 190, 103101. https://doi.org/10.1016/j.agsy.2021.103101. February.

NASS (2017) US Census of Agriculture 2017. Iowa. Table 2. Market Value of Agricultural Products Sold Including Landlord Share. Special Tabulation 23604. US Department of Agriculture. Available here: https://www.nass.usda.gov/Data_and_Statistics/Special_Tabulations/Completed_Tabulations/data-lab-records.php. Accessed Nov 3, 2022.

NASS (2017) US Census of Agriculture 2017. Iowa. Table 2. Market Value of Agricultural Products Sold Including Landlord’s Share, Food Marketing Practices, and Value-added Products: 2017 and 2012. In: 2017 USDA Census of Agriculture – State Data. Available at: https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1, Chapter 1, State_Level/Iowa/st19_1_0048_0048.pdf.

NASS, 2017a. Selected characteristics of farms by North American Industry classification systems: 2017. Table 48. In: 2017 USDA Census of Agriculture – State Data. Available at: https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1, Chapter 1, State_Level/Iowa/st19_1_0048_0048.pdf.

NASS, 2017b. Market value of agricultural products sold including food marketing practices and value-added products: 2017 and 2012. In: 2017 USDA Census of Agriculture – State Data. Available at: https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1, Chapter 2_US_State_Level/st99_2_0002_0002.pdf.

O’Connell, C., Gay, R., McDonald, N., Tayal, S., 2021. COVID connections: lessons from adaptations to COVID-19 as strategies for building food system resilience. Cult. Agric. Food Environ. 43 (2), 123–136. https://doi.org/10.1111/cagf.12276.

Sampson, H., 2021. Airlines have seen an unprecedented rise in disruptive passengers. Experts say it could get worse. Wash. Post. June 11, 2021. https://www.washingtponpost.com/travel/2021/06/11/air-flights-mask-incidents-faa-fines/.

Schreiber, K., Soubry, B., Dove-McFall, C., MacDonald, G.K., 2022. Diverse adaptation strategies helped local food producers cope with initial challenges of the Covid-19 pandemic: lessons from Quebec, Canada. J. Rural Stud. 90 (July 2021), 124–133. https://doi.org/10.1016/j.jrurstud.2022.02.002.

Westervelt, E., 2020. As food supply chain breaks down, farm-to-door CSAs take off. Nat. Publ. Radiol 1, 1–16. https://doi.org/10.1002/aepp.13121.