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Producer and consumer perspectives on supporting and diversifying local food systems in central Iowa

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Abstract

The majority of food in the US is distributed through global/national supply chains that exclude locally-produced goods. This situation offers opportunities to increase local food production and consumption and is influenced by constraints that limit the scale of these activities. We conducted a study to assess perspectives of producers and consumers engaged in food systems of a major Midwestern city. We examined producers' willingness to include/increase cultivation of local foods and consumers' interest in purchasing/increasing local foods. We used focus groups of producers (two groups of conventional farmers, four local food producers) and consumers (three conventional market participants, two locavores) to pose questions about production/consumption of local foods. We transcribed discussions verbatim and examined text to identify themes, using separate affinity diagrams for producers and consumers. We found producers and consumers are influenced by the *status quo* and real and perceived barriers to local foods. We also learned participants believed increasing production and consumption of local foods would benefit their community and creating better infrastructure could enhance efforts to scale up local food systems. Focus group participants also indicated support from external champions/programs could support expansion of local foods. We learned that diversifying local food production was viewed as a way to support local community, increase access to healthy foods and reduce environmental impacts of conventional production. Our research indicates that encouraging producers and consumers in local food systems will be more successful when support for the local community is emphasized.

Keywords Conventional food systems · Table food production · Locavores · Affinity diagramming · Producer perspectives on local foods · Consumer perspectives on local foods

Introduction

US Agricultural regions are highly specialized, growing large-scale monocultures for export to other US regions and globally. Iowa, like other Midwestern agricultural states, used approximately 23 of 26 million crop production acres in 2016 to grow two commodities: corn and soybeans (ISU Extension 2017). As a result, Iowans import 90–95% of food for direct human consumption (table food) from outside Iowa (ISU Extension 2018). For economies of scale, this approach is highly efficient. However, current food systems have negative environmental impacts (e.g., fossil fuel reliance, carbon footprint, biodiversity loss, impaired water bodies) and social ramifications (e.g., food insecurity, shrinking rural populations, dependence on federal commodity programs) (Vermeulen et al. 2012; Willett et al. 2019; Jarchow et al. 2012). Moreover, such systems have been criticized for being inflexible and vulnerable to supply chain disruptions (Clancy and Ruhf 2010; Dahlberg 2008; United Nations 2006). Increased food prices at the start of the COVID-19 pandemic demonstrated that global food supply networks could not adjust rapidly to sudden and widespread demand increases and supply shortages (Hobbs 2020; United Nations 2020).

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Alternative systems have emerged, driven by sustainable production on small-scale and diversified farms for distribution to local markets. Local food systems provide many economic, environmental, and social benefits to communities in which they are embedded, including fresh and healthy food for consumers, livable incomes for small and mid-sized producers, and support for rural economies (Becot et al. 2020; Hansson et al. 2013; Hughes and Isengildina-Massa 2015; Pitts et al. 2013). Economic benefits of local food systems are particularly important because small-scale US farms account for over half of cultivated agricultural land and over a quarter of annual US agricultural production (Economic Research 2019). Large-scale commodity farmers also benefit: producing for local markets is a diversification opportunity to reallocate underutilized farm resources to increase revenue (Barnes et al. 2015), reduce the risk of "all eggs in one basket," improve soil health, and reduce environmental impacts through increased biodiversity (Bowman and Zilberman 2013). Furthermore, US consumer demand for local table food has increased from $8.7 billion in 2015 to $11.8 billion in 2017 (Martinez 2021). A 2015 survey indicates 87% of consumers consider regional food when choosing a supermarket (National Grocers Association 2015). A 2021 survey reported 75% of consumers seek out locally produced foods/beverages, a 5% increase since 2019 (Hartman Group 2021).

Despite both producers' and consumers' interest in local food, 97% of US food is distributed through nationally- and globally-organized food supply chains (Woods et al. 2013). Consumers appreciate the convenience of large 24/7 supermarkets, compared with the difficulty of finding local food outlets with potentially limited product offerings due to seasonality and local climate/growing conditions. Furthermore, existing infrastructure and policy support large-scale production and distribution of commodity products, and many producers are satisfied with the *status quo's* convenience and economics (Arbuckle 2021). Thus, farmers who wish to start or expand table food production for local markets face significant barriers. Many have sought ways to facilitate connections between local consumers and producers (e.g., King et al. 2010; Mittal et al. 2018). Despite the two-sided nature of this problem, most previous studies on local food systems have focused on either producers or consumers, but not both. However, studying consumer preferences separately from producer challenges ignores their interdependence (Mehrabi et al. 2022). Furthermore, most work examining commodity producer efforts to change the *status quo* has focused on sustainable farming practices and environmental attitudes (Roesch-McNally et al. 2018). Far less work has examined the attitudes and views of large-scale commodity producers toward local food systems, although they potentially have a significant role.

The objective of this study was to assess perspectives of producers and consumers across local food systems, as well as their lived experiences, attitudes, and beliefs about increasing system capacity for local table food production in the US Midwest. Of particular interest were current conditions impacting the willingness of producers and consumers to shift toward localized table food production.

Such an approach requires a robust understanding of social dynamics across the food system, for which mixed-method analyses was used to provide unique insight (Berardy et al. 2020). Focus groups are a common qualitative method to enhance understanding of food system challenges and opportunities, build on theories, and connect practical applications (Sonnino et al. 2019). Eleven focus groups were conducted with commodity producers, specialty producers, urban specialty crop producers, general consumers, and locavore consumers. Focus group data was then consolidated to reveal patterns across participant groups and interpreted to develop themes and insights related to producers' and consumers' attitudes, motivations, and beliefs. Findings were clustered and interpreted using affinity diagramming methods and provided insights into challenges faced by both producers and consumers in building necessary connections—both physical and informational—to grow and strengthen markets to sustain local food systems. Our approach to data consolidation examined the emergence of themes shared across participant groups rather than coding for themes specific to commodity producers for example. Coding across the unique participant groups enabled us to examine where shared motives and barriers were expressed regarding participant's engagement with local foods as either a producer or consumer. Thus, we have organized our discussion of focus group responses below by themes across groups, rather than themes within groups; presenting examples drawn from all participant groups integrated within individual overarching themes.

The themes discussed below expand on previous work, in particular with the inclusion of commodity producer's views on diversifying their operations to include local food production. We observed that common motives for engaging with local food systems emerged across both commodity and specialty producers as well as consumers. Specifically, producers and consumers share intrinsic motivations surrounding local food systems, especially motives to support local communities. Producers and consumers further shared a common perspective that several structural elements representing the "status quo" within the food system represent real barriers to future development of local food systems. These shared perspectives across participants suggest that structural and policy changes to further expand local food production could leverage existing interest and motives among producers and consumers to benefit Midwestern communities, especially urban residents, while supporting local producers

and increasing consumer choice. This research could enable a more holistic understanding of table food production based on perspectives across the food system. Diversifying food system studies to incorporate the interconnected nature of stakeholder challenges and beliefs could also support strategic development of more sustainable local food systems, especially in and near growing cities.

Related work

Given the social and environmental problems associated with large-scale US commodity crop production, developing more sustainable and resilient table food production for local markets represents an important step toward improving food systems. This shift requires understanding attitudes and structures of supply and demand, reinforcing the existing system, and potential leverage points for change. Existing research on operational, structural, and perceived behavioral barriers to diversifying food production for local markets is reviewed, followed by potential benefits and motivations for producers to diversify despite potential barriers. We then identify factors encouraging or discouraging consumer purchases of locally-produced food. Finally, we note gaps in existing literature that prompted this study.

Producers' barriers to diversification

Before the 1940s, US farms were predominantly diversified, using crop rotation, intercropping, and crop-livestock integration (Plourde et al. 2013). Since then, most Midwest US farms (i.e., Corn Belt) have become highly specialized, producing just a few major crops in continuous cropping sequences (Plourde et al. 2013; Spangler et al. 2020). A US farm now averages 1.2 products per year (Valliant et al. 2017), with Corn Belt farms exhibiting the lowest diversity (Aguilar et al. 2015). Farmers choose specialization for many reasons, including economies of scale, mechanized harvesting, cheap agrochemicals, specialized crop breeding, low-cost long-distance transportation, and non-perishable commodity crop storage to sell according to market conditions (Bowman and Zilberman 2013).

By contrast, diversified crop production is often viewed as increasing farmer workloads (Medhurst and Segrave 2007; Northcote and Alonso 2011). Successful farmers must manage a carefully-selected product portfolio (Darnhofer 2014). Furthermore, challenges include hiring sufficient/affordable labor, water quality/quantity, and soil preparation issues (Miller 2019; Kopiyawattage et al. 2019; Selfa et al. 2008). Diversification for local markets may also require farmers to cooperate and collaborate to achieve the necessary scale to compete with imports (de Roest et al. 2018). This can be challenging if producers compete for the same customers (DeLind 2011; Iles et al. 2021).

Local food producers often struggle with marketing and distribution (Medhurst and Segrave 2007). While commodity farmers can delegate marketing activities to agencies, diversified farmers must dedicate time to finding alternative crop markets (de Roest et al. 2018). Small-scale farmers transporting small volumes of goods to local markets face increased handling and shipping costs per-unit (Vanwechel et al. 2007) and miss economies of scale achieved with long-distance freight movement (Day-Farnsworth and Miller 2014). Direct-to-consumer marketing is not always economically viable for medium-scale farms, which are usually not large enough to engage with commodity-based markets (Stevenson et al. 2011). High marketing and distribution costs can make food for local markets more expensive to deliver than conventional channels (Bowman and Zilberman 2013). Furthermore, consumers' expectations for consistent supplies of low-cost produce in all seasons encourage regionally-specialized production for national/global food markets rather than local diversification (Bowman and Zilberman 2013).

Policy can discourage crop diversification. The Farm Bill prioritizes commodity production over agricultural diversification (Spangler et al. 2020), with most US federal programs requiring production of specific crops (e.g., corn, soybeans) to receive payments (Bowman and Zilberman 2013). US Federal Crop Insurance Programs also disincentivize crop diversification, increasing costs when farmers add new crops, requiring long wait times to establish yield histories for new crops, and denying coverage for some non-program crops (Bowles et al. 2020). Furthermore, risk reduction provided by crop insurance may discourage farmers from diversifying by decoupling farmers' decision-making from associated environmental risks (Spangler et al. 2020). US Federal biofuel mandates have incentivized increased corn production (Wang and Ortiz-Bobea 2019). These policies and uncertain future crop prices encourage farmers to pursue short-term profits at the expense of long-term productive capacity via diversification (Houser and Stuart 2020).

Benefits of diversification

Despite potential barriers, many producers are motivated by economic, civic, and environmental factors to produce and sell table food locally (Schoolman et al. 2021). Diversification can help farmers mitigate economic risks, including price or yield fluctuations, input shortages (e.g., water, labor), and not finding buyers for specific crops (Bowman and Zilberman 2013). While specialization causes farmers to depend on a few specific commodities and increases their vulnerability to market volatility, diversification spreads economic risk (Roest 2018). Farmers also diversify to increase

utilization of family members, machinery, land area, and buildings (Hansson et al. 2013). Further, price premiums customers may be willing to pay for locally-produced food are attractive (Bowman and Zilberman 2013). Direct-to-consumer marketing can provide greater stability when markets fluctuate (Bauman et al. 2018; Martinez et al. 2010) and allow increased tailored information exchanges between producers and consumers (Kremin et al. 2004), helping producers better anticipate consumers' preferences (Park 2009).

Beyond economics, farmers may choose diversification to satisfy personal or social objectives, including retaining their farmer identity, increasing job satisfaction, continuing family traditions, engaging in social entrepreneurship, and strengthening community connections (Hansson et al. 2013; Gasson 1973; Migliore et al. 2014, 2015). Farmers seeking future family involvement in the farm business are more open to diversifying (Valliant et al. 2017; Medhurst and Segrave 2007). Civic motives include concern for the local economy, fellow businesses, and community job creation (Schoolman 2020; Kaika and Racelis 2021). A pro-environmental orientation is often reflected in concern for soil and water quality, reduced pesticide use, and more sustainable production methods (Schoolman et al. 2021). Many producers communicate their sustainable values and farming practices to consumers (Peterson et al. 2022). Thus, farmers' decisions to diversify are not always based only on expected short-term profits but also on a long-term vision of innovative planning and community partnerships. However, initial motivations for farmers to diversify may stem from strong short-term incentives such as mitigating immediate threats to their farm's viability (Northcote and Alonso 2011).

Consumers' attitudes toward local food production

Various reasons have been identified for what motivates consumers to seek and purchase local food (see reviews byFeldmann and Hamm 2015; Martinez et al. 2010). The most frequently cited motivation was perceived quality and freshness. In one study, 73% of consumers believed product quality is higher at farmers' markets than at grocery stores (Brown 2003), which they connect with shorter transportation distances (Chambers et al. 2007) and being freshly harvested (Schnell 2013). Many consumers value face-to-face interactions with producers, which facilitate trust and transparency about production methods and embed producers within communities (Hendrickson and Heffernan 2002; Schnell 2013). Health, nutrition, and food safety are also commonly mentioned as benefits of local food (Birch et al. 2018).

Many consumers like the idea of supporting local farmers and small-scale food producers (Tregear and Ness 2005; Bianchi and Mortimer 2015). Supporting local producers can be a stronger motivator for purchasing local food than product quality (Memery et al. 2015). Greater knowledge of local food leads to increased purchases. Familiarity with food production and preparation motivates local food purchases (Brown 2003; Zepeda and Li 2006). Marketing efforts can increase interest in local food (Campbell and DiPietro 2014), but consumers expect retailers to provide detailed information about the food they sell (Paloviita 2010).

However, relationships between consumers' attitudes toward local food and purchasing decisions are complex and reflect a variety of motives (Thilmany et al. 2008; Jensen et al. 2019). For example, rural consumers valued taste, freshness, lower prices, and local economic support. In contrast, urban consumers were concerned with animal welfare and respect for nature (Roininen et al. 2006). While nutrition, environmental concern, and support for local farmers are cited as *motivations* for buying local food, these may not significantly influence actual purchases (Zepeda and Li 2006). Habitual engagement and preference for local foods among some consumers have been characterized as an ideology of "locavorism" (Reich et al. 2018). Locavorism includes three broad ideological values and beliefs: lionization (local food is of superior quality), opposition (general distrust toward long food supply chains and infrastructure), and communalism (connecting and supporting local communities and businesses). Locavore values predict local food purchasing behavior (Reich et al. 2018) and visit restaurants sourcing local ingredients (Kim and Haung 2021).

The biggest obstacles to local food consumption are perceived inconveniences of finding, purchasing, and preparing local food when consumers have busy schedules and lack free time (Chambers et al. 2007). Most consumers prefer the convenience of supermarkets and other large retailers (Low et al. 2015; Hardesty 2008) and expect to purchase local food at stores catering to their shopping habits and preferences (Weatherell et al. 2003; McKee 2021). Inconvenient pick-up locations (Zepeda and Leviten-Reid 2004), inconsistent and limited hours (McKee 2021), and limited product offerings discourage shopping at farmers' markets or joining Community Supported Agriculture (CSA). Consumers also value a globalized food supply's variety and year-round availability (Chambers et al. 2007). By contrast, farmers' markets may close in winter, and most consumers do not have enough time to "buy ahead" and preserve food for off-season consumption (McKee 2021).

Gaps in current knowledge

Despite over two decades of scholarship surrounding local food systems, qualitative and quantitative research focused on producer motivations has received far less attention (Wade 2007). Much work surrounding producer motivations comes primarily from case studies of CSAs, farm-to-school programs, farmers' markets, and medium-sized

farms embedded within regional values-based supply chains (Schoolman et al. 2021). The potential role of large-scale commodity producers in local food systems has largely been ignored. However, these producers may have potential to help local food systems expand beyond niche markets, not only because these producers own land that, if made accessible and affordable, could give small-scale farmers a feasible path to scaling up, but also because commodity farmers define the status quo for agriculture in Iowa and could help to influence cultural change and attitudes about what it means to be a "good farmer". Furthermore, less work has explored consumer and producer perspectives on expansion of local food production/availability in a local market context, with most existing work examining the alignment and potential mismatch between production levels and consumer demand (Peterson et al. 2022; Werner et al. 2019).

In this study, we explore the perspectives of commodity and specialty producers, as well as consumers, *on efforts to diversify* local food systems within central Iowa. By discussing local food production and consumption with both producers and consumers, we aim to identify their shared and diverging views on local food production/consumption and their willingness to engage with and participate in diversification of local food systems.

Methods

Focus groups were used to gather empirical data from urban and near-urban producers and urban consumers to assess (1) current production and consumption practices, (2) values, objectives, motivations, and barriers influencing choices, and (3) drivers leading to more local table food production and consumption. The process occurred in phases: data collection, consolidation, and interpretation (Fig. 1). Literature review informed development of focus group scripts used to collect data from producers and consumers. Data consolidation followed a five-step contextual inquiry process (Beyer and Holzblatt, 1997) to reveal patterns and structure across homogeneous focus groups. Finally, consolidated data was interpreted to formulate themes and insights.

Research Design

Participant Identification and recruitment

Homogeneous groups were constructed to encourage participants to feel comfortable, natural, and to engender openness (Krueger 1994). Types of production and farm location determined producer groups:

- *Commodit*y crop producers: a sample of 1500 commodity producers from a 6-county area was purchased from Dynata. Producers received a letter, follow-up phone call, and email.
- *Specialty crop producers*: recruitment materials were distributed by local producer organizations (Practical Farmers of Iowa, Iowa Fruit and Vegetable Growers Association) via group lists. For those who gave permission, emails and follow-up calls were made. Producers who self-reported production of USDA-defined specialty crops were included in specialty producers' sample (e.g.,

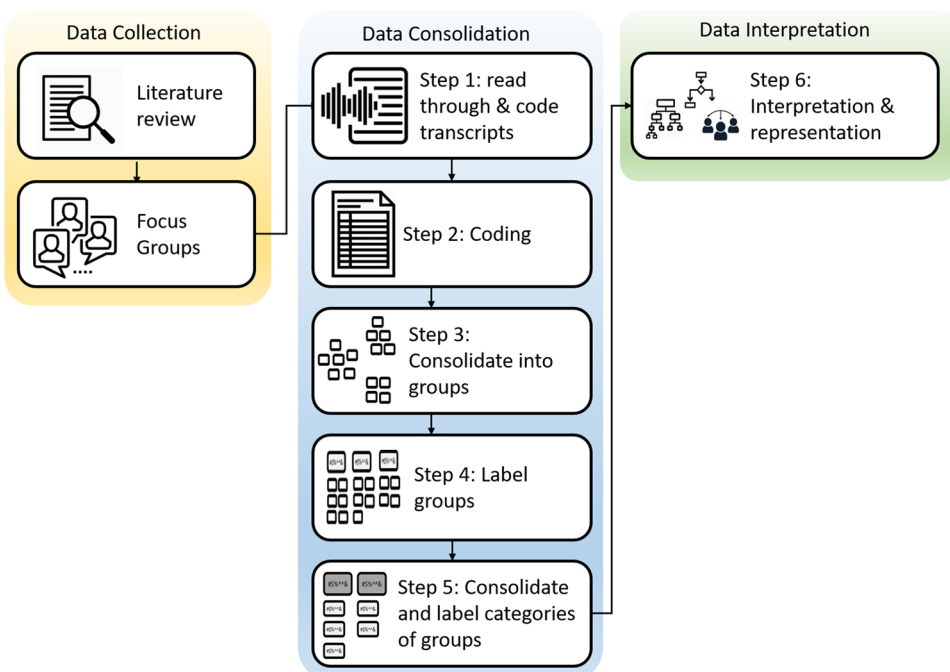

Fig. 1 Process for data collection, consolidation, and interpretation

"fruits and vegetables, tree nuts, dried fruits and horticulture and nursery crops, including floriculture," USDA 2014).

- *Urban specialty crop producers*: recruitment materials were distributed by local producer organizations (Practical Farmers of Iowa) and supplemented by emails and phone calls.

Consumer focus groups were stratified by diet choices typical for resident households:

- *General consumers* were contacted using non-probability sampling methods, including convenience, purposive, and snowball sampling. Invitation flyers encouraged participants to invite other eligible consumers.
- *Locavore consumers* reported diets consisting principally of local foods. They were contacted using non-probability sampling methods, including convenience, purposive, and snowball. Invitation flyers encouraged participants to invite other eligible consumers.

Questions script

The producer focus group script had 10 primary questions and up to five additional probing questions in four categories: current farm operations (1 question), perceptions of local food production (5), consideration of expanding local food production (1), and their assessment of barriers and opportunities for expanding local food production (3). The consumer focus group script had 12 questions and up to 10 additional probing questions among five categories: current consumer behavior (2), perceptions/consumption of local food options (5), consumer social networks (1), consideration of increasing local food consumption (1), and their assessment of barriers and opportunities for increasing consumption of locally grown/raised foods (3).

Location and setup

Producer focus groups were conducted in a community center meeting room. Consumer focus groups were conducted online via Zoom due to the COVID-19 pandemic. Each focus group lasted 90 min, and participants were compensated $50.

Data collection

A facilitator conducted each meeting using the script to ensure a similar experience for each focus group. A second person took notes and provided support.

Producer focus groups

Six producer focus groups were conducted with 31 participants (Table 1). There were two commodity producer groups (C1, C2), two specialty producer groups (S1, S2), and two urban specialty crop producer groups (U1, U2). The focus groups varied from three to six participants each. Farm sizes across focus groups varied based on the composition of the focus group participants and their crop types; however, the average number of acres for most commodity and specialty producers was near the 2021 state average of 359 acres in Iowa (USDA 2022).

Consumer Focus Groups

Five consumer focus groups were conducted with 21 participants (Table 2). There were three general consumer groups (G1, G2, G3) and two locavore consumer groups (L1, L2). The focus groups varied from three to five participants each. Participants listed the percentage of the shopping they do for the household, and the primary places they do their shopping.

Table 1 Participants in producer focus groups (n = 31)

Focus group	Number of participants	Crops	Ave. farm size (range)
C1	6	Row-crop, cow-calf, corn and beans, sheep, livestock, strawberries (picking), poultry vaccine, rotational grazing, grains, rye	314 (133–488) acres
C2	4	Corn, beans	108 (14–287) acres
S1	4	Fruits, vegetables, herbs, pasture, alfalfa, beef cattle, sheep, chickens (broilers), row crops, peas, oats, soybeans, eggs, millet, wheat, buckwheat, cereals	584 (8–2200) acres
S2	6	Bees (honey) cattle, eggs, dairy goats, apple and peach orchards, vegetables, chickens (broilers), berries, tart cherries, rhubarb	Small farms
U1	6	Hydroponic micro-grains, watermelon, cantaloupe, gourds, herbs, vegetables, butter, tomatoes, peppers, eggplants	Unknown
U2	3	Vegetables, gourmet mushrooms, chestnuts	Unknown

Table 2 Participants in consumer focus groups (n = 21)

Focus group	Number of participants	Shopping responsibility of participant % (Range)	Location of primary food shopping (especially perishable vegetables)
G1	3	89 (60–100%)	Aldi, Hy-Vee, Iowa Food Co-Op, ethnic food stores
G2	4	84 (75–95%)	Hy-Vee, ALDI, Trader Joe's, Fresh Thyme, Target
G3	5	88 (50–100%)	Hy-Vee, Target, Aldi, Iowa Food Co-Op, Fareway, C Fresh, Global Greens CSA
L1	5	67 (10–100%)	Farmers' market, ALDIs, Gateway Market Co-op, CSA, local farms, Fareway, Trader Joe's, Whole Foods, Natural Grocers, Iowa food Co-Op
L2	4	95 (90–100%)	Iowa Food Co-Op, Aldi, Hy-Vee, Fareway, Target, Price Chopper

Data consolidation

Audio recordings were transcribed (Step 1, Fig. 1). Each focus group produced an average of $M = 765$ lines ($SD = 236$). Two raters independently coded each transcript (Step 2). A spreadsheet was developed with rows containing transcript lines, complete quotes, and a short label ("nugget") capturing the quote's essence. On average, each rater produced 87 (SD = 16) nuggets. Two raters' spreadsheets were combined and reconciled. On average, 52.9% (SD = 16.4%) of nuggets from pairs of raters overlapped. Each focus group produced an average of 109 (SD = 36) nuggets. Across 11 focus groups, a total of 1203 nuggets (657 for producers, 546 for consumers) were developed.

We used affinity diagramming to build representations that could be shared and interpreted with others (Brassard 1989; Beyer and Holzblatt, 1997). Nuggets were grouped into clusters based on shared characteristics (Step 3). There were no pre-determined cluster names. Each nugget was transcribed onto a sticky note and placed on a shared electronic whiteboard application MURAL (Tactivos, Inc.). Six researchers met on Zoom and silently moved sticky notes around the board to group nuggets. Researchers were free to move notes whenever/wherever they liked, including previously moved notes. After no longer moving notes, the team collectively discussed each cluster to decide on a label (Step 4).

Once completed, the affinity diagram for producers contained a total of 657 items in 62 clusters. Figure 2a illustrates the affinity diagram for producers, where one cluster has been expanded as an example of a cluster that arose from the process. A second affinity diagramming process was completed to develop 11 categories from 62 cluster labels (Step 5, Fig. 2b). This process was repeated for the consumer affinity diagram, which contained 546 items in 67 clusters and then grouped into 16 categories.

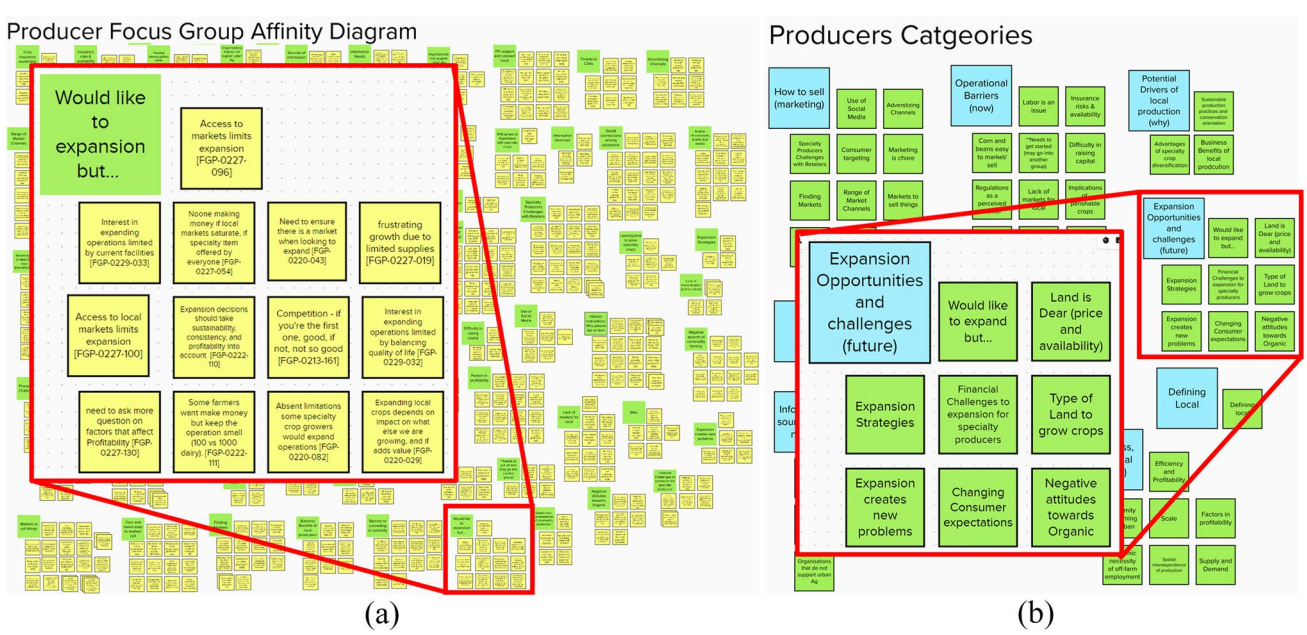

Fig. 2 **a** Affinity diagram for producer focus groups (left), where one cluster has been expanded as an example; **b** Category grouping of cluster labels (right), with one category expanded as an example

Data interpretation

Affinity diagrams and two-level organization of categories and clusters were analyzed to develop themes (i.e., Step 6, Fig. 1). The affinity diagrams were the result of the team interpretation sessions, where a large number of focus group participant-generated ideas were organized into their natural relationships. The interpretations allowed the team to make connections between ideas, synthesize insights, and meaningfully cluster them in themes. The interpretation sessions allowed the team to build a shared understanding and build a consolidated picture of the market (Holtzblatt and Beyer 1997). The team focused on themes emerging from both producer and consumer responses.

Findings

Producer focus groups: categories and clusters

There were 11 categories with cluster titles and number of nuggets in the cluster (Table 3).

There were 16 categories from the analysis of consumer focus groups (Table 4). For each category, the cluster titles and number of nuggets in the cluster are given.

Interpretation

Theme 1: maintaining *status quo* is a strong psychological force

Commodity producers indicated the *status quo* production system (i.e., large-scale field corn and soybeans) is predominant because of its substantial infrastructure advantages for crop production, marketing, and sales channels. One

Table 3 Categories and clusters titles from analysis of producer focus groups. Numbers represent nuggets in each cluster

Category Title	Clusters (count of nuggets)
Business, Financial (why?)	Economic necessity of off-farm employment (10); Efficiency, profitability (13); Profitability factors (15); Proximity of farming to urban (6); Scale (5); Production spatial interdependence (3); Supply and demand (13)
Defining Local	Defining local (30)
Diversification into local: opportunities and challenges (future)	Barriers converting to specialty (13); Leasing land for specialty crops (6); Willingness to experiment with specialty crops (7)
Expansion Opportunities and challenges (future)	Changing consumer expectations (15); Expansion creates new problems (5); Expansion strategies (3); Financial challenges to expansion for specialty producers (7); Land is dear (price, availability) (18); Negative attitudes towards organic (7); Type of land to grow crops (4); Would like to expand but… (13)
How to sell (marketing)	Advertising channels (8); Consumer targeting (3); Farmer market challenges (5); Finding markets (14); Marketing is a chore (15); Markets to sell things (21); Range of market channels (22); Specialty producers challenges with retailers (21); Threats to CSAs (8); Social media (6)
Information sources and needs	Crop insurance availability (6); Current consumer knowledge and expectations (15); Information needs (9); Information overload (4); Learning opportunities (2); Organizations not supporting urban agriculture (6); Current consumer knowledge and expectations (6); Social connections among producers (18); Sources of Information (6)
Miscellaneous	Miscellaneous (6)
Operational Barriers (now)	Challenges for local interconnected (4); Corn beans easy to market/sell (15); Difficulty in raising capital (3); Implications of perishable crops (5); Insurance risks and availability (11); Labor issue (30); Lack of markets for local (12); Middle infrastructure, distribution needs (24); Processing challenges (14); Regulations as perceived barrier (20)
Potential drivers of local production (why)	Advantages of specialty diversification (20); Business benefits of local production (9); Sustainable production practices and conservation orientation (25)
Problems with status quo of commodity crops (now)	Lack of diversification (within farm) (4); Negative aspects of commodity farming (13); Unintended consequences of commodity production (5)
Producer characteristics (who)	Attitudes to change (6); Farmer demographics (12); Farming demographics shifts (8); Intrinsic motivations: Why people like to farm (17); Specialty crop producers are… (3)

Table 4 Categories and cluster titles from analysis of consumer focus groups. Numbers represent nuggets in each cluster

Category Title	Clusters (count of nuggets)
Advocating for raised awareness of local through channels	Word of mouth important for getting info on local (8); Channels for raising awareness of local (26); Consumers must be educated about benefits of local (7); Gaps in raising awareness of local (6); If knew more, I would consider local more (11); Limited awareness of local promotion (3); Limited effectiveness of word of mouth (6); Promoting local through word of mouth (6); What they talk about when talking about local (11)
Challenges limiting local food market growth	Challenges to growth of local market (supply, demand) (4); Organizational support for local spotty, lacking (4)
Grocery shopping characteristics	Motivations to shop at more than one store (6); One principal household shopper (3)
Lack of familiarity with food hubs	Lack of familiarity with food hubs (6)
Lure of big stores demotes consideration of local	Big chains potentially have local (7); Chain create loyalty through amenities, price, experience (14); Covid-19 changed shopping behaviors (14); Supplement non-local groceries with local food (5)
Perception local for those that can afford it	Cost determines where, what I buy (8); Factors affect willingness to pay more (8); Local food costs too much (14); Some consumers have fewer constraints to buy local (4)
Perceptions of limited availability of local	Finding, identifying local can be difficult (13); Limitations of local (availability, range) are barrier (5); Limited options to buy local (1); Not a lot of local at chains (6); Roadside stands used to provide more access to local food (7); Year-round availability of local foods is challenge (8)
Positive perceptions of locally produced product	Local food perceived higher quality (5); Local food perceived as healthy (11); Local food tastes better and fresher (9); Local more about produce (2)
Preference for local	Has track record buying local (3); Specialty Items motivate certain stores (5); Would choose local first (6)
Producer business considerations	Earning amount and timing as a local producer (9)
Pros and cons of farmers' markets	Farmer markets can be big, stressful (12); Farmers' markets popular (5); Farmers markets perceived as more social atmosphere than food (12); High awareness of farmers markets but frequency of visits vary (11); Opportunities and challenges of farmer markets business (10)
Reluctance and skepticism of local	Consumers skeptical of some claims of local (7); Get local by growing own food (4); Local not my thing (7); Skepticism of perceived benefits of local (4)
Social value of supporting small business/community of local production	Alignment with local supports values (12); Buy local because of personal connection with producer (11); Buying local gives support for local small businesses (16); Local is about social values (15); Local is who is producing (8); Reasons why keeping small farms operating is important (7)
Importance and expectation for convenience	CSA convenient but difficult to manage (14); Local foods need to be more convenient (13); Location affects use of local (convenience) (24); Might buy more local if convenient (to buy, to make) and not too expensive (12); Buying local is trade-off (price, convenience) (5); Shopping local requires planning (6); Status quo consumption hard to change (3); Ways to make shopping local easier (3); Will shop where more choices (4); Would like more convenient-to-prepared foods (5)

participant argued commodity crop production should be lauded for its efficiency and productivity:

> *I don't think we need to beat up on agriculture maybe, an acre of ground today is more productive … I think agriculture should be commended for what they do. And yeah, there are things that can be improved. But on the whole, I think farmers do a very good job.*

When asked if they had considered producing specialty (table food) crops for local markets, and efforts to encourage more local table food production, several commodity producers said they were discouraged by the amount of labor (especially physical labor) required to produce them, compared with highly-mechanized commodity crop farming. One participant who had experimented with producing specialty crops felt the time commitment was overwhelming. Other participants recalled personal experiences with farming before mechanization, such as managing weeds before widely available herbicides/sprayers and vividly remembered the physical labor required. This is coupled with difficulty of physical labor as farmers age. One commodity producer indicated that even if specialty crop production yielded more revenue, the labor increase would not be worthwhile.

When specialty crop producers were asked if they knew commodity crop producers interested in producing specialty crops for local markets, participants were doubtful, emphasizing advantages of the *status quo*. Several participants pointed to necessity of producing specialty crops at a sufficiently large scale to make money, to make investments in new planting/harvesting equipment worthwhile, and to efficiently complement commodity crop production:

> *Well and truthfully it would be a really hard sell to convince someone to do that, because that's someone that has thousands of acres and so even if you want to talk that person about converting 1% of their acreage into pumpkins… that can still fit in to their system, they still got to get a seeder that would work with something other than soybean and corn.*

Commodity producers spoke at length about the relative ease of marketing commodity crops and accessing commodity markets. Nearly all commodity participants market their crops by taking them to the nearest co-op or grain elevator. Ethanol plants also provide convenient options for distribution. When asked if they had ever considered producing specialty crops for local markets, one participant demurred, emphasizing ease of marketing as a major driver for commodity production:

> *One of the main reasons corn and beans work is because I can sell number two yellow corn any place I want, any day I want.*

The ability to store non-perishable crops allows farmers to be strategic about when to sell:

> *…we hold [the harvest] until we figure it's…the best time to market. Or when we actually need cash. So it kind of depends on the situation.*

However, several participants noted this strategy did not always pay off, with issues like mistiming markets, paying for storage, or additional transportation costs.

In contrast with commodity producers, specialty producers felt small-scale production allowed them more control when considering expansion, allowing them to craft their operations to their preferences. When asked what might encourage them to expand or limit them from expanding, several specialty participants simply stated they were happy with their current situations:

> *Time and quality of life I think, we like to keep them like a manageable scale …we could easily get bigger, but you can get smarter…my goal was always to get better before I got bigger.*

Some specialty producers indicated expansion did not guarantee financial growth and therefore viewed maintaining their current operation as fiscally prudent. They expected expenses to rise as production expanded, and their ability to multi-task deliveries with regular family-related travel could disappear at larger scales. When asked if they would consider expanding their business via a new on-farm market channel, some producers disliked the intrusion:

> *We decided not to do a "you-pick-it" just because we looked at a whole lot of people trampling on your property and not really caring and not honoring your place.*

Like producers, consumers—even those in "locavore" focus groups—appreciated the advantages of the *status quo*, particularly the ability to conveniently purchase a wide variety of affordable, high-quality food at ubiquitous large-scale chain retailers with long hours. They wanted to minimize time and maximize flexibility:

> *Our days are pretty jam-packed…Hy-Vee is everywhere, so it's always on the way, but if there was something else relatively close, I think we'd consider it…Schedules are just a little too crazy some days to sidetrack to someplace else. … there's only so much time in every day.*

Participants also liked the ability to make all their purchases (all food plus household items) in a single chain store, and benefits outweighed affordability. Several participants also valued familiarity with their regular chain stores, which reduced the amount of time spent searching for items. Knowledge of product location transfers to any store part of the same chain:

> *I've shopped at Hy-Vee for so long that I know all of the different store layouts they have. They have several different layouts that almost every single store alternates between, so I can almost always figure the store out. So, that makes me fast too.*

Some consumer participants valued the choices available at chain stores, where product variety offers consumers flexibility with meal planning:

> *It's the selection. We're trying to change our diet a little bit. We're trying to be a little bit more creative about what we're eating, changing things up. So, Hy-Vee tends to have that selection.*

While quality of chain store products might suffer, they valued their ability to count on consistently available acceptable-quality products. One locavore participant reported relying on chain stores to supplement local food supply, mainly due to seasonality. Another consumer purchased nearly all of their groceries from a local food hub, they also relied heavily on deli food from a chain grocery store:

… it's not just about getting raw foods to folks... What's your local equivalent of Hamburger Helper or mac n' cheese that you can make in five minutes when you get in the door…. If you're wanting to order things or to purchase things that are very simple to make, there is less of that available that has been produced by local folks.

Theme 2: barriers to local production and consumption

Producers considering transitioning into or expanding specialty crop production noted multiple structural barriers to change. Commodity producers perceived unreliable specialty crop markets as a significant barrier to experimenting with mixed production on their land:

Last year, we started growing a few oats, and we really had trouble with that. We had a buyer and he backed out and so then where's the next buyer for medium-quality oats? And the price went from $3.50 down to two bucks real quick. What do you do with a couple thousand bushels of oats? So handling those small quantities of, it's similar to the food producers, to the vegetables, as we get into small grains, where is our market?

When asked what would change their mind about producing for local markets, several producers noted getting local food onto retailers' shelves would require greater access to processing facilities. While some facilities exist, accessing them is inconvenient, with one producer reporting the nearest processor was a four-hour drive from their farm:

…For poultry, chicken, and ducks there are only two [processing facilities] in Iowa now. One recently closed. …Facilities like that are very important.
We need a cannery, or a processor, available to us. We need someplace to flash freeze our carrots, and a place to store and sell them. Same with tomatoes. We could can or process local tomatoes, but there is no place available.

Several producers expressed willingness to expand or transition where markets were favorable. Others were skeptical and felt more institutional support and consumer awareness would be required to increase specialty market availability. Current specialty producers reported only modest success in accessing local grocery store chains. Uneven experiences may be due in part to product type and individual buyer decision-making at a given store. Some specialty producers expressed optimism regarding emerging markets and consumer demand for specialty ingredients within grocery chains. Wholesaling directly to specific grocery chains was viewed as potentially stable and profitable:

The development of the natural food market or the local food market has had a dramatic effect on our business over the last probably five or six years because…there for a while we were expanding our store sales like 25% a year and we used to have to literally beg these stores to let us in. Now they call us and it makes, it's gotten easier in that respect

Furthermore, many commodity producers viewed marketing of specialty crop production as unpleasant and best avoided:

I like to raise things, but I don't like to market them. That's just not my thing. I'd rather be working than out telling somebody why my product is better than somebody else's or better than you can get at the store.

Some smaller specialty crop producers noted self-marketing makes finding work-life balance more difficult. While alternative marketing options such as CSAs or local farmers' markets afford opportunities to market directly, many specialty producers expressed ambivalence; for example, CSAs can be an additional time burden, and subscriptions can fluctuate, creating uncertainty over future sales.

Producers also expressed frustration that consumer preferences for convenient, low-cost, and familiar products reflect a general under appreciation for the unique qualities of specialty crop production. Urban specialty crop producers prefer to target consumers who appreciate the seasonality of growing local specialty foods, avoiding need/hassle of educating consumers about how to prepare novel and unfamiliar produce. Producers noted many consumers are unwilling to pay a premium for higher quality and locally-grown produce, where specialty producers cannot scale their production up to achieve lower prices:

More needs to be done in regard to teaching consumers about local, not just making more farmer's markets. …Or they don't fully understand why the price points are different. It's local why does it cost more? Well, because it's not grown by a big farm and shipped across country in large numbers and things.

Consumers reported a lack of availability and convenience as significant barriers to purchasing more local foods. Suppose consumers could find local foods in their preferred grocery stores. In that case, they might prioritize them over other offerings, as long as they are easily identified and do not have to shop at multiple stores to purchase them:

Being a full-time working mom with young kids, it's hard for me to go out of my way to buy it, but if it's available where I'm already out, I'm more than happy to support it.

Seasonality is a contributing factor as well—consumers were more likely to seek out and favor locally raised produce during spring and summer when such products were more readily accessible and visible but felt during winter, local produce was not a viable option. Consumers also reported struggling to use all their CSA produce or found it challenging to use an abundance of novel ingredients. This places an added burden on consumers wanting to support local food while juggling everyday demands of meal planning and preparation:

I think [CSAs are] really great. It's a little tricky, just because we have a smaller household. Sometimes it's too much food. So, it's kind of tricky when you don't have control over the volume.

As producers noted, many consumers indicated their budgets prohibited purchasing local foods, perceived as more expensive. Where price parity occurred, consumers stated they would select local products. Some consumers did express a willingness to seek out local products even when more expensive, principally to engage with local producers and support the local economy:

I don't have a ton of money to spend, so I want it to go where it's going to stay locally, and I know when you shop locally, the money goes back and it cycles through the local economy.

Some consumers perceived local producers as being more responsive and were willing to seek out and pay more to have products "tailored" to their needs and tastes:

…your local producers will sometimes cater to you. … This year we wanted a 10-pound chicken for Christmas from our local chicken girl [and she] said, "Here, I'll raise you a 10-pound chicken." I cannot go to Hy-Vee and get a 10-pound chicken.

For their part, producers were moderately hopeful that engaging with consumers could increase awareness and expand interest in locally-grown foods and support local producers. Several specialty crop producers noted the success of on-farm events to better educate consumers, drawing attention to product "localness" and facilitating connections between producers and consumers. Finally, most specialty producers were already using several online platforms (e.g., Facebook, Instagram) to engage consumers and directly market products.

When asked about efforts to encourage more local table food production in Iowa, producers offered a mixed response. One commodity producer believed many resources were available to support local production in Iowa, such as university cooperative extension offices. However, several specialty producers noted most agricultural organizations only support large-scale commodity production:

I think large Ag groups like Farm Bureau don't actually support the small farmer or the local food production anymore. They're more focused on international trade markets…and commodity crops
Reaching out to any of the dairy associations in Iowa, right away they get back to me, but then when they find out more they're like "oh, we'll look into it and let you know, maybe", but they really just don't want to mess with non-subsidized farming…

Local government changes in land assessment can also present challenges:

...we got this notice from [the] assessor, that your land has now been assessed residential because it was based on…highest and best use, not legacy use. So the taxes went from $18 an acre to like $800… that changes the whole dynamic for many people. Especially when you can get that kind of money for that land.

Theme 3: local food benefits individual and community

Commodity producers did express interest in experimenting with specialty crop production, in large part from a critique about the current lack of diversity in Iowa crops. Producers lamented how little food consumed today is grown within the state. Furthermore, producers recognize diversification as a strategy for successful operations, acknowledging potentially increased income via novel markets and risks and limitations of monocultures, such as commodity price fluctuations:

…the diversification of farm income....farmers that say they do corn and beans all the time… are kind of in a straight-jacket because of the cost of production. Always higher than you get back from marketing your corn and beans. So if there was a way to diversify some of the production to some other crop or some other activity related to farming that will generate a fraction of your income, then that could be a way of doing it, too.

Commodity producers saw opportunities for emerging local specialty food markets, especially for smaller producers, where food quality and sustainable production methods would appeal to consumers willing to pay a premium for such products, allowing producers to capitalize on a niche market not otherwise available for traditional row crops:

…on any given piece of land, I don't care how good it is, there's going to be 10 to 15% of it, that's not profitable as a corn and soybean field. So, let's turn that into a model where we say, 'Here's 10 to 15% of my farm that I'll let you, young producer, grow

vegetables on, become a local producer because it's losing me money now, as a corn and soybean farm.' That fits in with a lot of that lower-quality land, is where we have the environmental issues that we're creating. So I'm trying to make it into a win-win situation.

Producers also emphasized environmental and social considerations. Farming was a lifestyle associated with values not directly tied to economic incentives. Among these values was appreciation for sustainable land use. Several producers expressed concern that current row-crop production methods were threatening long-term viability of Iowa soils and potentially jeopardizing future producers' ability to maintain a farming lifestyle:

…the current way we're doing agriculture is not sustainable, period. I mean I don't know what the timeline is, but the way we do commercial corn and soybeans, we're destroying our resources. So that means at some point, we've got to go back to local food production, local distribution …

Specialty crop producers take pride in working with their families and producing crops within their communities. Creating a quality product and staying within their community influences their decision to continue producing:

It's a community thing. So I think that's where a lot of that kind of that morale comes from. I think it's just seeing people enjoy those products locally. So then having the ability to go into your local grocery store and see your own products on the shelf is something that's rewarding.

Also, similar to producers, many consumers emphasized importance of local food for their communities. Themes from consumer discussions of local foods included the association between local food and personal values and beliefs: creating social connections, supporting local economies, and concern for the environment. For many consumers, purchasing local foods provides an opportunity to support and express values they perceive to be better addressed by local food production and marketing. Consumers valued knowing they had contributed to community entrepreneurship and seeing their consumption as an investment in individuals, local businesses, family farms, and institutions within their community:

It's kind of important to me knowing that at least part of the place where I'm getting my food and where my money is going is to these smaller businesses and these local farmers who tend to have better practices for producing food that tend to be more in [line] with my values. It's probably the most important reason for shopping local.

Some consumers equated support for local food with a means of supporting economic mobility among local producers and their employees:

I was just thinking about the Latino community and other immigrant and refugee communities. And how producing locally can be a form of social mobility and socioeconomic mobility.

For consumers, forging connections with producers is both a motivation and a benefit of purchasing locally. Consumers noted such connections increased transparency related to concerns about how food was grown, labor practices, and land stewardship. Some consumers felt nostalgia for historical farming systems, where smaller family farms were the norm. For these consumers, purchasing local foods is an effort to maintain and perhaps restore some of what they perceive as a cultural as well as an economic institution:

[I] just think there's such a tradition in Iowa. We have some of the richest farmland in the world. There's just such a tradition of producing foods and people having gardens and buying from farmers markets here. …Just keeping that tradition alive and being a part of keeping smaller farms and smaller productions in business at a time when corporate farming seems to be growing and growing is important to me.

Many consumers expressed dissatisfaction with industrial agriculture and mainstream commodity agricultural production practices associating local food consumption with greater sustainability. In particular, consumers commented on the degree local food production positively affects soil and water quality while increasing biodiversity. Several consumers viewed local producers as having a stronger land ethic:

Okay, we live in Iowa. It traditionally had the best soil, and we're ruining our soil. We're ruining our rivers by the way we're farming. So, anything that I can do to support farmers, diversifying in what they grow. Supporting farmers in having diversity in their crops to help build up our soil. And so runoff doesn't go into the rivers, and chemicals don't go into the rivers to pollute our drinking water.

The timing of consumer interviews during the height of the COVID-19 pandemic was reflected in consumer concerns about the fragility of extended supply chains stemming from larger agri-food systems. Consumers noted local foods and shorter supply chains could provide resilience during such disruptions:

So the importance buying local, we only have to look at the current state of affairs with the meat packing, if we don't support local, we could be in a world of hurt

for just our entire food chain. That's one link in the food chain that is not broken…. So the more that we can support local, more that we can encourage local, the more stable our food supply is going to be.

Theme 4: outside the status quo system, consumer and producer preferences are misaligned

Producer and consumer perspectives on local food production suggests several overlapping motivations and preferences conducive to diversifying local food systems. However, there were meaningful differences among producer and consumer preferences as well, and addressing these differences will help sustain current local food systems and encourage future expansion.

Both specialty and commodity producers generally expressed strong intrinsic motivations toward farming and contributing broadly to food systems, but current specialty producers expressed frustrations regarding the marketing of their products to consumers. Several specialty producers viewed the marketing of their products as a distraction from day-to-day production and a competing demand for their time.

Well marketing would still be my thing. I just don't like to do that. I'm happier working, than I am out telling somebody why my product is better than somebody else's or better than you can get at the store.
It's like playing tennis against yourself you serve it and then you have to run to the other end of the court and serve it back. So, you have to understand the marketing. So anytime you're taking time away from producing, then you're out trying to market and vice versa.

In contrast to specialty producers' preference for less engagement and interaction with consumers, consumers placed a great deal of importance on interacting with and making connections with producers.

…having met a lot of local Iowa producers... I mean, just knowing them and seeing what they do every day and the work they put in and how much they actually care about it, I think it's really neat. It's a neat thing to see, and it's just important to see that some people put their whole life, their whole energy into growing good food, local food to share with other people.
If I had a connection more so to the farmers or the growers, the people that are providing it, I think that would have a heavier influence on me buying from them.

Among specialty producers who dislike marketing, many also expressed their frustrations regarding the seeming indifference or lack of understanding consumers have toward food production and broader farming practices.

At farmers ma*rket, everyone thinks, "Oh this is farmers market, this stuff should be really cheap. "And so again, I go back to the lack of education of people don't understand all that's involved in fruit production. But it's not at all unusual to say, "Well yeah, I could buy that at the grocery store for that. So why should I pay you that much?" And to go to Phyllis's point, that's the reason most people don't like the market. You end up having to defend yourself and unless you're a real people person and enjoy that sort of education and interaction, you'd just as soon let somebody else handle that.*
"Well, I can go to the grocery store and get it." Yeah well, you want it fresh or do you want it heaven knows where or how it's been produced or anything? But I think it is education, that people don't realize how much work it is to produce things. Not only vegetables, but livestock and stuff like that too. They don't just happen.

Aligning with some of the frustration's producers noted above, consumers did express strong preferences for local foods to be more convenient, easier to prepare, and cheaper, relative to existing status-quo food options in national chain stores.

I find myself not necessarily thinking about local foods or meals or what I'm going to cook all that much throughout the day which sort of results in me not necessarily planning for it very well, which is why I end up going to places like Hy-Vee or Price Chopper when I would generally, if I was planning better, probably be a little better about getting local foods.
The other piece of it that I come back to sometimes is the processing piece and being able to... and I actually, I don't know of any specific efforts around this, but that it's not just about getting raw foods to folks who that takes time in the evening, but how can you also get your... What's your local equivalent of Hamburger Helper or of mac n' cheese that you can make in five minutes when you get in the door.

Theme 5: need for better local food infrastructure

Both producers and consumers described physical and informational barriers to increased production and consumption of locally-produced food, some of which seem to be at odds. For example, producers reported efficient transportation/distribution mechanisms would be necessary for local food to be profitable, while consumers expected convenient access to local food retailers or home delivery. Furthermore, many producers viewed the effort required for marketing and selling to consumers as a significant barrier. They also perceived consumers' lack of education and misplaced values

as problems. However, many consumers said they would purchase more local food if they could find it without engaging in time-consuming (and often fruitless) research.

Both producers and consumers offered ideas about bridging these gaps to meet everyone's needs. The overarching theme was a greater connection between producers and consumers. Specifically, increased use of online platforms for information sharing, as well as access to appropriately-scaled processing and distribution infrastructure, were discussed frequently by participants on both sides of the supply chain.

Platforms facilitating online sales, such as the Iowa Food Cooperative website, were considered invaluable by locavores, and several consumers mentioned search engines as a way of finding farmers and products. However, one consumer commented searching online might not be sufficient because they could not find what they were looking for (e.g., CSAs) or confusing results:

> *I did a search… and I had a hard time coming up with anything that I was sure was local and offering what I was looking for….[It's] overwhelming. I mean I've found sites that had things on it, but there was so many things and a lot of them were just farms and I didn't know if I can get food there. It seems kind of tough.*

By contrast, participants in non-locavore consumer focus groups discussed the importance of information sharing on social media as a trusted hub of information for where to find sources of local food. Another consumer suggested more local farmers should leverage social media to connect with consumers:

> *I think about relationships that I have with restaurant owners and something that I noticed is that they're just really active on social media and it makes them seem more approachable so that when I go into their business, I'm familiar with them and they're kind of familiar with their followers or customer base that way. So, I think if more local farmers had a greater social media presence, that would probably increase the amount of visits I would take because I would just know more, have more opportunities.*

No commodity producers mentioned social media or online platforms as a means of connecting with consumers. However, participants in all four specialty crop focus groups brought up online platforms to connect with new customers and make sales via their own websites, the Iowa Food Cooperative website, or (more commonly) social media, especially Facebook and Instagram. An urban specialty crops producer described how social media could offer consumers a direct connection with producers and a convenient purchasing option. However, another specialty producer suggested that while online platforms are necessary, physical infrastructure must also support timely distribution since products are often perishable.

Most discussions about processing and distribution infrastructure to overcome logistical challenges came from specialty crop producers. However, one commodity producer mentioned the idea of centralized, regional produce/livestock auctions as a way of connecting farmers with buyers. Similarly, one specialty crop producer mentioned possibly outsourcing some sales to a distributor to help them reach more consumers and expand their business. However, they were concerned about cost and reliability:

> *[To expand, I would] probably have to find a broker. I had a guy who wanted to take over distributorship of our product, for which he was going to take 25%. Doesn't cost me 25% to be distributed. And I had a friend up in Wisconsin who bought a lot of honey and he was approached by a company that wanted to take over his distributorship, for a fee of course. And they didn't run it a year and decided it wasn't doing what they said were going to do and they shut her down…There was no way I was going to let that happen because this direct sales to the store is the heart of our business. So we have to preserve this delivery route.*

Both specialty crop producers and consumers frequently mentioned the Iowa Food Cooperative—a regional food hub—as a solution attuned to small-scale producer needs. The Co-Op also provides convenience that consumers expect. It was suggested the food hub model be expanded to operate within mainstream grocery stores for even greater convenience. A specialty crop producer suggested food hubs could expand to facilitate processing and marketing:

> *"Because you've got all these producers coming together, why couldn't we have a commercial kitchen there? Why couldn't we use the Iowa Food Co-Op as our entity to approach maybe getting a dairy license, or that type of thing where we as producers who are members of the Co-Op could participate in that and then you can start marketing cheese or whatever."*

One specialty farmer acknowledged many consumers demand convenience and are able and willing to pay for it; hence, farmers could find ways to offer convenience profitably:

> *"The convenience factor is 100%. I used to notify people when their meat was ready to pick up, but many of them didn't bother to come. Now I deliver all meats straight to their door. Increase the price, they do not care. They just ask 'what do I owe you.'"*

Theme 6: external actors are needed to support local food systems

Both producers and consumers pointed to specific needs for external facilitators—especially government officials: facilitating procurement of products from local producers and preservation and access to land for food production. Consumers emphasized support for procurement, while specialty producers spoke primarily about government support for land access.

When asked what would encourage her to purchase more local food, one consumer thought the city had a responsibility to connect farmers with buyers by providing residents with information on local food sources. Another consumer also noted the importance of buyers for large quantities of produce, and potential city government help to reach these buyers:

> *I think one thing that could benefit local growers and encouraging local food is working with power brokers, like the Greater Des Moines Partnership and The Chamber to influence some of the larger organizations like Hy-Vee and Fareway to buy more local…A lot of their focus is on local economies like bars and restaurants and I think, at least in my opinion from what I've seen, less on local growers and farms and things of that nature.*

In addition to city government, universities can play a significant role in supporting local food systems by allocating part of their food-service budget to procurement from local sources. One of the specialty producers gave an example of a university in northeast Iowa that buys local food products and strategically partners with local producers to facilitate collaborative fulfillment.

Consumers also discussed the role of federal funds in supporting local food systems via food assistance programs. In particular, benefits from USDA programs like the Supplemental Nutrition Assistance Program (SNAP) and Special Supplemental Nutrition Assistance Program for Women, Infants, and Children (WIC) have been extended to support local food purchases. Low-income participants can use their SNAP and WIC benefits at farmers' markets. In many states (including Iowa), they can double the value of their vouchers when purchasing fresh fruit and vegetables. These programs increase low-income consumers' access to healthy local food. Simultaneously, they increase sales for producers.

Specialty crop producers—especially urban producers—mentioned limited access to land as a barrier to expanding their operations. They expressed frustration with agricultural land being rezoned for "higher-value" purposes (i.e., commercial or residential) (Theme 2). However, one urban producer noted the potential for government to protect farmland through zoning restrictions. Another urban producer identified an Iowa non-profit organization dedicated to preserving farmland specifically for sustainable food production:

> *The [Sustainable] Iowa Land Trust [is] able to find the workaround for that land to ensure that it stays in tax-friendly havens and farm trusts that are more tax-advantageous to help kind of prevent that land from going into uses that the owners might not want it to go into originally.*

One urban farmer also noted the role that the city had played in supporting urban agriculture by providing easy access to land for food production:

> *So we have really faced little resistance in creating a new kind of legal way for people to utilize the side-yard lease program that was already in effect to do that to then grow gardens on and being able to sell that food. There's now a lease that the City … can do for that.*

Discussion

A notable result from this study is the observation that many producers and consumers view participation in local food systems as a means of supporting their communities, which aligns with their personal values. Specialty producers are motivated to help improve the health and well-being of consumers in their communities, and consumers view purchasing local food as a way of financially supporting farmers who live and work in their communities. These results align with existing research, in which "civic embeddedness" (i.e., feelings of connection and commitment to the wellbeing of one's community) is found to motivate producers (Schoolman et al. (2021); Hvitsand 2016; Matts et al 2016) and consumers (Hinrichs 2000; Skallerud & Wien 2019) to engage with local food systems.

Less research has examined commodity producers' concern for their communities. As with the specialty producers, the commodity producers in this study believe that producing local food will benefit their communities. However, they tended to emphasize the potential benefits to other farmers, rather than health benefits to consumers. Many of them viewed production for local markets as a way of reducing environmental impacts associated with commodity production, thereby maintaining soil health for future farmers. This aligns with existing research on farmers and "land ethic" (Leopold 1949), which has revealed that managing and conserving land for future generations is important to farmers (Ahnstrom 2009), including Midwestern commodity farmers (Vaske et al. 2018). However, some of the commodity producers also viewed participation in local food systems

as a way for established farmers to help young/new farmers in their communities by leasing land to them to grow specialty crops.

This shared emphasis on community as a driver for increased local food system participation suggests that appealing to individuals' desire to be good citizens (and to be *perceived* as good citizens) could be an important but overlooked strategy in encouraging greater production and consumption of local food and changing the *status quo*. An important nuance is that individuals' definitions of "community" differ: focusing on the symbiotic relationship between specialty producers and consumers may not motivate commodity producers. Instead, a targeted strategy is needed—one that acknowledges commodity producers' view of "community" as "the farming community".

While specialty farmers, commodity farmers, and consumers all agreed that local food is a mechanism for supporting and strengthening community, producers' and consumers' views on how to encourage greater production and consumption were somewhat misaligned. Producers want to earn a decent living and maintain a satisfactory work-life balance. They want to find ways to spend more of their time and energy on-farm, rather than focusing on distribution and customer engagement. They particularly dislike and wish to avoid having to convince people of the value of local food—why it is worth the extra expense and effort to procure and prepare it. However, this kind of interaction and personal connection with producers is exactly the appeal of local food for some consumers, and many consumers do balk at the higher prices and inconvenience. To convince consumers to purchase more local food, it must become easier and cheaper to do so, and they want to understand the value proposition. This disconnect between producers' and consumers' requirements and expectations is a major barrier to local food system expansion.

To bridge this gap, both producers and consumers pointed to the need for better infrastructure and greater support from governments/NGOs in terms of policy. Indeed, this result suggests that the misalignment between producers and consumers is not a consequence of individual recalcitrance, laziness, or sense of entitlement, nor is it reflective of market failure inherent to local food systems. Rather, it is a symptom of a root-cause problem: there are many structural factors (markets, policies, social institutions) that effectively disincentivize local food systems in support of commodity agriculture. These large-scale structural forces "outweigh…the values, views, and resources of individual farmers" (Schoolman & Arbuckle 2022) and prevent individuals from behaving according to their community- and environmentally-oriented values (Prokopy et al. 2019), thereby upholding the status quo. Thus even though many producers and consumers value their communities and see the potential of local food systems to support and strengthen these communities, there is very little that they can do on their own to affect large-scale food system change. It is reasonable for producers to expect to make a living wage, just as consumers are justified in expecting to have access to fresh and healthy food at affordable prices. However, this requires the development of appropriately-scaled supply chain infrastructure and the implementation of policies that level the playing field for local food systems, with respect to financial incentives and risk mitigation. Without changes to existing structures, even the most ardent and well-meaning supporters of local food systems are facing an uphill battle.

Conclusion

Localized food systems could address some social and environmental externalities associated with current industrial-scale production systems (Ilieva 2017; Schnell 2013). Local food represents an opportunity to diversify producers' operations—reducing risk and increasing revenues (Barnes et al. 2015), creating novel forms of local economic development (Bowman and Zilberman 2013), and reducing vulnerabilities inherent in long food supply chains (Clancy and Ruhf 2010; Dahlberg 2008; United Nations 2006). However, less work to date has explored, quantitatively or qualitatively, the perspectives of producers (particularly commodity crop producers) for diversifying existing monoculture operations which contribute little to local food systems. A significant contribution of this research is inclusion of commodity producers' views on diversifying their current operations to include table foods available for local consumption The perceived incentives and barriers of commodity producers toward local food production represent an important but often understudied pathway to addressing broader resistance to changing the status quo of industrial food production in the U.S.

This study aimed to assess connections between producers and consumers, as well as lived experiences, attitudes, and beliefs about increasing the capacity of systems for local table food production in the US Midwest. Several themes emerged across specialty and commodity crop producers as well as consumers. A significant theme shared across all focus group participants are the enormous influence status quo structural factors have on decision-making in regards to local foods. Important intrinsic motivations for engaging with and supporting local food systems also emerged as a theme across producers and consumers. Taken together, these themes suggest that stimulating, diversifying, and sustaining local food systems will require addressing specific barriers and leveraging incentives tailored toward multiple stakeholders (e.g., producers, consumers, grocers, government policymakers) at multiple levels (local, regional, state, federal) within food systems to encourage support for local food Those changes could relate to policies, incentives,

subsidies, marketing channels, and processing facilities. Additionally, synergies with other urban systems, such as energy and water, will need to be further explored and communicated to the public.

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Declarations

Conflict of interests The focus group methodology for this study was approved by the Institutional Review Board of University (Ethics approval number: ISU 19-234). The authors have no relevant financial or non-financial interests to disclose.

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