

THESIS

EXPLORING LOCAL FOOD PURCHASING PATTERNS DURING COVID-19:  
INSIGHTS FROM A NATIONWIDE CONSUMER SURVEY

Submitted by

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## ABSTRACT

### EXPLORING LOCAL FOOD PURCHASING PATTERNS DURING COVID-19: INSIGHTS FROM A NATIONWIDE CONSUMER SURVEY

The onset of the COVID-19 pandemic shocked many aspects of life, and food was no exception. One very large shift that occurred, and was likely influenced by both economic and public health shocks, was in the ways that people purchased food, particularly in the use of new market channels. The following study, as of a larger USDA Agricultural Marketing Service project interested in impacts of COVID-19 on local and regional food systems, investigates local market channel use. In particular, we investigate the extent to which increased interest in local food markets is observed across a national sample and, if so, how it correlates with consumers' behavior-influencing traits like food values and COVID-19 impacts.

This study contributes to existing literature through its collection of a large, national consumer survey dataset with a novel focus on local and regional market channels and more in-depth understanding of shifting consumer preferences for non-traditional market channels. We find that a nearly one third of our survey sample used new local and regional market channels during COVID-19, and that individual COVID-19 impacts and values related to local and social welfare were significant predictors of new market channel use. We also find that COVID-19 risk, exposure, and income and employment impacts significantly affect likelihood of new local market adoption. Identifying these traits and values of consumers participating in new market channel behaviors provides valuable insight for local food system practitioners strategizing for a post-COVID future, such as implementing values-based marketing and leveraging technology.

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## CHAPTER 1—INTRODUCTION

### 1.1 Introduction

The onset of the COVID-19 pandemic shocked many aspects of everyday life, including how and where people shopped for food. Food, due to its essential nature and purchase frequency, required every household to immediately reconsider their behavior during the onset of COVID-19, but also may have led to longer-term shifts in habits as the pandemic persisted. One shift that occurred was in the location (i.e., market channel) where people chose to purchase food, and particularly, a significant shift away from food away from home (FAFH). FAFH is generally defined “as being obtained from restaurants, cafeterias, food trucks, and vending machines,” in contrast to food at home (FAH), which is generally acquired from retailer grocery stores and prepared in the home (USDA ERS 2018). FAH spending increased 26% from February 2020 to March 2020, with FAH spending exceeding FAFH spending from March 2020 until April 2021, disrupting the longstanding trend of FAFH commanding a relatively higher share of food spending (USDA ERS 2020; USDA ERS 2021).

These shifts may have been influenced by both economic and public health shocks of COVID-19, including stay-at-home orders, widespread unemployment and furloughs, and supply chain shocks. Supply chain disruptions stemmed from labor shortages, public health restrictions, regulatory rigidities and shifts in consumer demand for essential products, leading to shortages in items like meat products (Weersink 2021; Thilmany et al 2020). The nature of these consumers shifts, especially as it relates to use of local and regional food market channels, is our primary research interest.

In a New York Times article from September 2020, “7 Ways the Pandemic Changed How We Buy Food,” one observed impact of COVID-19 on food purchasing behavior was increased interest in local and regional foods: “The fragility of the supply chain, concerns over health and safety and an appreciation of community have buoyed the movement toward food that is raised or produced locally” (Severson 2020). The following research investigates this noted trend and seeks to characterize the observed increase in use of local food channels using a national sample of consumers in the United States. This study contributes to existing literature through its collection of a large, national consumer survey dataset with a novel focus on behavior across a disaggregated and heterogeneous set of local and regional market channel categories during the COVID-19 pandemic. The primary research questions and goals addressed in this study are:

- 1) What consumer and COVID-related perceptions were correlated with new and planned purchasing patterns in local market channels during COVID-19?; and,
- 2) What meaningful consumer segments can we identify based on existing consumer attitudes (values, perceived consumer effectiveness) and COVID-related heterogeneity (risk, exposure, changes to income and employment) across consumers?

## **1.2 Background and Motivation**

There were myriad COVID-era impacts seen in the food sector in 2020. Changes in consumer behavior included stockpiling food products, increased spending on food at home, shifting purchases to online platforms, and increased interest in local food market channels

(Silverstein 2020, Macias 2020, USDA ERS 2020, Redman 2021, Severson 2020). Despite rising prices for goods like meat and eggs, consumers “continued to flock to supermarkets during the COVID-19 pandemic” and were purchasing “food supplies to last them weeks or even months” (Macias 2020). For some retailers, online grocery sales increased by 300% during the initial months of the pandemic (Redman 2021). These trends represented a large shift for food retailers, both big and small, as they pivoted to accommodate overall demand.

In light of demand- and supply-side shocks to food and agricultural systems during COVID-19, USDA Agricultural Marketing Service initiated its “Local and Regional Food System Response to COVID-19” (LRFS COVID-19) project, a collaboration between 16 communities of practice in local and regional food systems, as well as researchers from three universities. Partners on this project represent a wide range of food systems sectors, including: direct market channel-focused organizations like community supported agriculture programs (CSAs) and farmers markets; institutionally-focused farm-to-school and farm-to-institution organizations; product-specific groups focused on meat, seafood, and small grains; grocery and retail partners representing independent and cooperative grocers. Independent restaurants were also represented on the project, as they were particularly challenged by COVID-19 (Dua 2020, Klein 2020). The goal of the project was to identify challenges and opportunities facing local and regional food systems during COVID-19, as well as innovations resulting from supply chain disruptions.

In a number of project deliverables, including impact assessments and listening sessions with project partners, the research team was able to capture common themes and priorities related to initial COVID-19 impacts, challenges, trends, and pivots. There were a number of positive impacts in these local food sectors, including an influx of new customers and effective

transitions to online sales (CSA Listening Session 2020; NGA Listening Session 2020; Farmers Market Listening Session 2020; Cooperative Grocers Listening Session 2020). This real-time partner feedback suggested that some consumers were, indeed, participating in local and regional market channels more during COVID-19 than during pre-pandemic times for one reason or another. Researchers also noted this trend, pondering the extent to which the substitution into local market channels was a reaction to limited supply in other market channels associated with larger, more traditional supply chains, as opposed to an increased importance to the consumer of supporting local business during economically challenging times (Thilmany et al 2020; Hobbs 2020). Understanding this consumer shift into local market channels is the primary focus of our research, as it was of paramount interest to food systems partners on the LRFS COVID-19 project. The size, nature and persistence of these shifts in consumer behavior—such as the use of local and differentiated market channels—are of interest to food systems stakeholders, particularly producers and managers of food markets who have seen changes in their consumer base during COVID-19.

To complement impact assessments, listening sessions, and innovation briefs describing challenges, opportunities, and innovations across local food systems communities of practice, the project's research team also developed and distributed a nationwide consumer survey. The consumer survey was developed with this partner-focused project in mind, so the primary goal of the survey was to glean insights on consumers food purchasing behaviors as they relate to COVID-19, with an emphasis on local and regional market channels. These were the areas of interest for the project partners in informing future decision making and strategy in their respective local food sectors.

The stakeholders' primary questions and areas of interest were framed to address two key questions: 1) what consumer characteristics, experiences, perceptions and values drove them to engage new local and regional markets, and what does this suggest for the persistence of newfound consumer interest; and 2) are there patterns and trends we can identify among these new consumer segments to support customer retention strategies moving forward as the COVID-19 pandemic wanes. These local food systems stakeholder interests inform the research questions, approaches and findings shared in this paper.

## **1.3 Project and Research Background**

### *1.3.1 Food Markets during COVID-19*

When COVID first appeared in the U.S., there was uncertainty about how local and regional markets would be affected. Thilmany et al (2020) estimated that during March through May 2020, local and regional COVID-19 sales and payroll reductions in the LRFS sector would lead to a national economic loss of \$1.32B (10% to 25%). And, Richards and Rickard (2020) report anecdotal evidence that consumers stockpiled frozen fruits and vegetables in early periods of the pandemic, potentially reducing future fresh produce sales. However, there were segments predicted to grow significantly as well. In their quick assessment of online local foods sales between April and May 2020, Thilmany et al (2020) found online sales by local and regional food businesses with e-commerce options increased by 360% due both to increases in the number of orders (+189%) and dollars spent per order (+71%). FAH spending exceeded FAFH spending, rising to a high of 66% of food spending at FAH channels in April 2020 (USDA ERS 2020). FAH spending surpassed FAFH spending for 13 straight months, from April 2020 to August 2021, with 2020 being the first year since the Great Recession of 2008 where FAH

spending accounted for over half (51.4%) of food spending in the United States (USDA ERS 2021).

### *1.3.2 USDA Ag Marketing Service Local Food System Programming*

To leverage the rich set of stakeholders the “Local and Regional Food System Response to COVID-19” project brought together, including community of practice coordinating organizations (COPCOs), several elements of applied research were compiled. Compiling COVID-related resources and asking member networks to host listening sessions and develop innovation briefs gave this collaboration an effective means to quickly assess the sectors’ changing viability and performance during this market disruption (<https://lfsCOVID.localfoodeconomics.com/>). In outlining a plan of work, the research team recognized that the complex nature of a rapid-response project necessitated a novel approach to framing a consumer survey that would capture the more subtle, time-dependent and nuanced aspects of recent events.

Partner insights collected from listening sessions and impact assessment, including trends, challenges, and innovations in their respective communities of practice, were particularly valuable in framing the scope of the consumer survey. For farmers markets, positive impacts of COVID-19 included “increased sales for some markets/vendors, due at least in part to a higher demand for local food by consumers and markets’ rapid action in providing contactless purchasing opportunities” (Farmers Market Coalition 2020). Likewise, the community of practice representing CSAs noted that “many CSA farms have sold out and have waiting lists” (CSA Innovation Network 2020). Cooperative and independent grocers also noted new customers and increased sales, perhaps due to perceived cleanliness and safety of smaller format

stores, as well as greater product availability compared to larger retailers (National Co+op Grocers Association 2020; NGA Foundation 2020). This real-time partner feedback suggests that some consumers were, indeed, participating in local and regional market channels more during COVID-19 than during pre-pandemic times.

The consumer survey was developed with this partner-focused project in mind, so the primary goal of the survey was to glean insights on consumers food purchasing behaviors as they relate to COVID-19, with an emphasis on local and regional market channels. These were the areas of interest for the project partners in informing future decision making and strategy in their respective local food sectors, as well as understanding past behavior. Our primary research goal is to understand drivers of consumer behavior changes during COVID-19. In particular, what factors drove an individual's decision to begin using new, locally differentiated and specialty market channels during COVID-19?

## CHAPTER 2: LITERATURE REVIEW

### 2.1 Local and Direct-to-Consumer Market Channels

Local markets channels such as farmers markets and CSAs have grown rapidly in the past decade. According to the 2015 Local Food Marketing Practices Survey by USDA NASS, direct-to-consumer sales, which includes farmers markets, farm stands, on-farm stores, CSAs, and direct online sales, was the most popular form of direct marketing for farms, with 69% of farms participating in direct sales (USDA NASS 2016). As of 2021, there are over 8,600 farmers markets registered with USDA, more than quadruple the number of markets in 1994 (Farmers Market Coalition 2021). While direct-to-consumer market channels do not make up the largest share of local food sales, they are used most commonly by farms (USDA NASS 2016). Direct markets are commonly used, especially by smaller farm operations, due to fewer barriers to entry and two primary benefits: 1) retaining a higher percentage of total revenue since there is no “middleman” distributor; and 2) opportunity for relationship building and direct connection with customers (Adam et al. 1999). In addition, there are benefits to the consumer of buying from local market channels, including access to fresh produce and increased trust and stronger relationships with producers (Moser et al. 2008; Thilmany, Bond, and Bond 2008). Further understanding what factors drive consumers to shop at direct markets is of value to a large number of small and midsize food and farm businesses who benefit from the unique nature of these channels, as well as the consumers who benefit as well.

This growth in local market channels over the past two decades has resulted in a body of literature related to consumers’ use of local channels and their preference for local products. Much of the current research on consumers’ preference for “local” has been done in the product

space (for example, apples or tomatoes), where the primary interest is the purchase of specific local food products, as opposed to drivers of consumer behavior that lead to the use of local market channels, but recently researchers have integrated marketing channels into their studies. A 2011 study used a consumer values framework to determine consumer willingness to pay for “local” and “organic” food products given their attitudes towards certain environmental and societal values statements, but allowed those values to vary by where the shoppers tended to buy their produce (Onazaka et al. 2011). A survey of farmers market shoppers in Kentucky used the Likert-scale values question, “How important is local food to your customer choices?,” to classify different levels of “local” shoppers and connect their value of local with their purchases of local food at farmers markets, grocery retailers, and restaurants (Mehajadiri and Woods 2019). A 2012 study investigated intrinsic and extrinsic motivations of different consumer segments for local food behavior, finding that high environmental and knowledge of organic production practices increases probability of being an “adventurous consumer” and using organic and local markets (Zepeda 2012).

Several studies investigated consumer motivations for shopping at farmers markets. Commonly cited motivations included: food quality and freshness (“buying fresh produce”), supporting local agriculture, and social considerations (Baker 2009; Gumirakiza et al. 2014; Onazaka et al. 2010; Pucciarelli and Faith 2014; Zepeda 2018). The objective of this research is to characterize consumers use of differentiated market channels as opposed to differentiated products. Specifically, we are interested in consumers’ use of local and alternative market channels. With more traditional market channels carrying locally produced items, availability of “local” items is no longer limited to direct-from-producer channels like farmers markets and CSAs (Onazaka et al. 2011). This increased market availability of local products suggests there

may be other factors influencing a consumers' preference for local and alternative market channels beyond simply their desire to purchase local food products.

### *2.1.1 Demographic Characteristics and Local Food*

According to the current literature, a number of consumer characteristics and factors influence use of local channels like farmers markets and consumption of local food products. In a 2012 review of studies that characterized farmers market shoppers, consumer characteristics like age, income, race, and motivations are all elements that may influence the probability of being a farmers market shopper (Shanks, Shanks, Misyak, and Serrano 2012). The average age of farmers market shoppers six studies was found to be around 40 years old and generally lower than the U.S. population average, but the review noted that there is not a critical mass of research to conclude that age alone is a significant driver of farmers market participation (Shanks, Shanks, Misyak, and Serrano 2012; Zepeda 2018). Consumers with above average income may be more likely to shop at farmers markets (Zepeda 2018). Exploration of race as a driver of market choice shows mixed results, with some studies finding that the majority of farmers market shoppers tended to be white, while race was not found to be a significant factor in other studies (Shanks, Shanks, Misyak, and Serrano 2012; Zepeda 2012). Altogether, demographic characteristics have mixed findings in the existing literature, but are worth including in our analysis as they are sometimes significant, plus, the role of demographics may have evolved during the pandemic.

Household size and children under 18 are characteristics that have been found to be significant in predicting participation in direct food markets (Zepeda 2018). We include them as independent variables in the following model. In addition, COVID-19 has had a substantial impact on schooling, with 93% of households with school age children reporting use of “distance

learning” and virtual options during spring and summer of 2020 (McElrath 2020). School closures were mandated in 44 states and the District of Columbia during April 2020, with 41 of those states requiring schools to remain closed for the remainder of the 2020 school year (Zviedrite et al. 2021). These impacts on in-person schooling options had the potential to greatly disrupt the routine of households with one or more school age children, including where and how to purchase food.

Preference for affordability and preferences for local food products has been shown to have a negative relationship with local food purchasing (Rainbolt, Onazaka, McFadden 2012). Similarly, CSA partners noted during a listening session that while CSA sales increased during COVID-19, the CSA model still appeals more to customers who can afford the large upfront payment to cover a “share” of their farm’s produce (CSA Listening Session 2020). We hypothesize that this relationship will hold in our model, where respondents who highly value affordability in their food purchasing decisions are found to be less likely to shop at new local and regional channels during COVID-19.

Based on this literature mentioned previously, we have included a series of attitude and PCE statements to reflect these previously documented motivations among some consumers. We hypothesize that individuals with higher reported levels of local-oriented food values, including valuing locally-produced food and purchases that support the local economy, were *more likely* to adopt a new, local market channel between April to October 2020. In addition to local food values and COVID-19 factors, we included other food values that have been known to influence consumer preferences for differentiated products, including social fairness and broader community benefits (Rainbolt, Onazaka, McFadden 2012).

### 2.1.2 COVID-Specific Factors

Based on listening sessions with local food systems stakeholders—CSAs, farmers markets, independent and cooperative grocers—there was a shared sentiment that many new customers in these channels turned to local food because of perceived safety and cleanliness, online and no-contact access to food, and availability of products that were unavailable in larger retailers with a more impacted supply chain (e.g. meat and flour) (CSA Listening Session 2020; NGA Listening Session 2020; Farmers Market Listening Session 2020; Cooperative Grocers Listening Session 2020). We hypothesize that higher perceived risk of COVID-19, exposure to COVID-19, greater value placed on personal and public health protocols, and perceived impacts of COVID-19 on diet and shopping all had a *positive* effect on a consumer's use of a new, local market channel from April 2020 to October 2020.

## CHAPTER 3: METHODS

### 3.1 Dataset and Data Collection

A nationwide consumer survey was developed in the summer and distributed in the fall of 2020 to capture information on consumer food behavior in the wake of the COVID-19 pandemic. The finalized consumer survey instrument was distributed to a nationwide consumer panel by Qualtrics in October and November of 2020, resulting in a sample of 5,000 respondents. This survey incorporated elements from existing, validated survey instruments on consumer food behavior, while also including novel adaptations of existing literature to address the specific local and regional market channels of interest, as well as the COVID-19 impacts that may have impacted consumer food behavior. The full survey instrument, including sources for survey question language, are included in the Appendix.

Response quotas were enforced for age, race and ethnicity, and income in order to obtain a survey response pool that was generally representative of the U.S. population at large, based on the U.S. Census and Current Population Survey for 2019. A gender quota was not enforced, as females tend to be the primary grocery shopper for the household. Analysis of the American Time Use Survey show that females are the primary grocery shopper in 80% of households with children and 68% of households without children (Schaeffer 2019). Table 1 and Table 2 provide demographic summary statistics of the total sample of 5,000 responses compared to the U.S. population at large.

Table 1. Demographics Summary: Age, Race, and Gender

| <b>Variable</b>                                  | <b>Number of Respondents<br/>(n = 5,000)</b> | <b>% of Total Responses<br/>(n = 5,000)</b> | <b>% of U.S. Population<br/>(2019 U.S. Census)</b> |
|--------------------------------------------------|----------------------------------------------|---------------------------------------------|----------------------------------------------------|
| <b>Age</b>                                       |                                              |                                             |                                                    |
| <i>18 – 24</i>                                   | 635                                          | 12.70%                                      | 11.90%                                             |
| <i>25 – 34</i>                                   | 883                                          | 17.66%                                      | 17.85%                                             |
| <i>35 – 44</i>                                   | 837                                          | 16.74%                                      | 16.42%                                             |
| <i>45 – 54</i>                                   | 887                                          | 17.74%                                      | 16.01%                                             |
| <i>55 – 64</i>                                   | 818                                          | 16.36%                                      | 16.64%                                             |
| <i>65 and older</i>                              | 940                                          | 18.80%                                      | 21.18%                                             |
| <b>Race</b>                                      |                                              |                                             |                                                    |
| <i>White</i>                                     | 3,637                                        | 72.74%                                      | 76.3%                                              |
| <i>Black, African American</i>                   | 676                                          | 13.52%                                      | 13.4%                                              |
| <i>Asian</i>                                     | 212                                          | 4.24%                                       | 5.9%                                               |
| <i>American Indian, Alaskan Native</i>           | 121                                          | 2.42%                                       | 1.3%                                               |
| <i>Native Hawaiian, Other Pacific Islander</i>   | 60                                           | 1.20%                                       | 0.2%                                               |
| <b>Gender</b>                                    |                                              |                                             |                                                    |
| <i>Female</i>                                    | 3,087                                        | 61.74%                                      | 50.8%                                              |
| <i>Male</i>                                      | 1,890                                        | 37.80%                                      | 49.2%                                              |
| <i>Self-Identified/<br/>Prefer not to Answer</i> | 33                                           | 0.66%                                       | n/a                                                |

Table 2: Demographics Summary: Household Income

| <b>Household Income<br/>(2019)</b> | <b>Number of<br/>Respondents<br/>(n = 5,000)</b> | <b>% of Total<br/>Responses<br/>(n = 5,000)</b> | <b>% of U.S. Population<br/>(2019 Current<br/>Population Survey)</b> |
|------------------------------------|--------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------|
| <i>Less than \$10,000</i>          | 302                                              | 6.04%                                           | 5.05%                                                                |
| <i>\$10,000 - \$19,999</i>         | 298                                              | 5.96%                                           | 8.03%                                                                |
| <i>\$20,000 - \$29,999</i>         | 450                                              | 9.00%                                           | 8.03%                                                                |
| <i>\$30,000 - \$39,999</i>         | 430                                              | 8.60%                                           | 7.91%                                                                |
| <i>\$40,000 - \$49,999</i>         | 348                                              | 6.96%                                           | 8.06%                                                                |
| <i>\$50,000 - \$59,999</i>         | 372                                              | 7.44%                                           | 7.20%                                                                |
| <i>\$60,000 - \$69,999</i>         | 320                                              | 6.40%                                           | 6.37%                                                                |
| <i>\$70,000 - \$79,999</i>         | 351                                              | 7.02%                                           | 5.73%                                                                |
| <i>\$80,000 - \$89,999</i>         | 179                                              | 3.58%                                           | 4.99%                                                                |
| <i>\$90,000 - \$99,999</i>         | 379                                              | 7.58%                                           | 4.55%                                                                |
| <i>\$100,000 - \$149,999</i>       | 944                                              | 18.88%                                          | 15.55%                                                               |
| <i>\$150,000 or more</i>           | 627                                              | 12.54%                                          | 18.54%                                                               |

### 3.1.1 Survey Time Periods

The survey asks a series of questions related to market channel use, market channel expenditures, and online purchasing in three time periods: September 2019 (pre-COVID), April 2020 (onset of widespread COVID-19 restrictions in the U.S.), and September 2020 (“current” behavior at the time of survey distribution). September 2019 was selected to capture pre-COVID-19 behavior. April 2020 was selected to capture behavior during a month where widespread COVID-19 restrictions had been implemented across the United States. While April 2020 does not capture the initial onset of pandemic restrictions, which occurred in mid-March

2020, April 2020 captures the first full month where COVID-19 restrictions were implemented broadly across the entire US. There is also secondary data showing evidence that consumer food behavior around food-at-home and food-away-from-home spending experienced a substantial shift in April 2020 compared to earlier months (USDA ERS 2020).

September was selected as pre-COVID benchmark a subsequent COVID month for 2019 and 2020 for a number of reasons. The primary reason September 2020 was used is because it was month immediately prior to the month in which the survey was administered, October 2020. September 2019 was selected to represent pre-COVID behavior because it was one calendar year prior to the September 2020 time period, which may contribute to any seasonal impacts of food behavior. In addition, September is a month without any major holidays. September also captures local market channel usage better than a month like December because direct channels like farmers markets, farm stands, and CSAs are generally open and operating in September, whereas a month later in the calendar year, like December, may not capture the usage of these channels in many regions of the country due to seasonality.

### *3.1.2 Market Channels—Uniquely Disaggregated Choice Set*

One unique aspect of this dataset is its inclusion of a uniquely disaggregated choice set of market channels in the survey. We started from the question used by the USDA Economic Research Services' FoodAPS to delineate market channels, and additionally, expanded market disaggregation based on feedback from project partners. Respondents were asked about their participation in traditional market channels (e.g., supercenters, supermarkets), in addition to specialty channels (e.g., butchers and bakers, small format grocery stores) and local and regional market channels (e.g. farmers markets, direct-from-producer farm stands and CSAs). This set of

market channel choices included in the consumer survey allows us to capture consumer participation in non-traditional market channels that have seen increased use during COVID-19. We also included a question about whether respondents shopped at a new business in a specialty, local, or regional channel for the first time since April 2020, which captures consumers who newly adopted or increased their use of non-traditional market channels.

### *3.1.3 Use of New Market Channels*

In addition to asking which market channels consumers newly visited or purchased from, respondents were asked, “Did you purchase from a business for the first time, in any of the following categories, in the past 6 months (since April 1, 2020)?,” where their options were: CSA; Farmers Market; Direct-from-Producer; Food Box; Bakery, Deli, Meat or Fish Market (gourmet or ethnic); and Local, Independent Restaurant. Of the 5,000 respondents, nearly one third of the sample ( $n = 1,543$ ; 30.86%) responded that they had shopped at one or more businesses in these channels for the first time since April 1, 2020. In addition, 41.73% ( $n = 644$ ) of these respondents stated that they newly shopped at a business in more than one of these market channels. This finding aligns with the insight from project partners who observed higher sales and new customers shopping in their markets.

Respondents were also given the opportunity to share where or how they had learned about the new place, or places, where they shopped since April 1, 2020, in reference to the previously described question. Coded open ended answers show that “Word of Mouth” and “Internet” were the two themes with the highest frequency of responses (Thilmany et al. 2021). Consumer respondents to this survey primarily learned of new businesses in local and regional market channels through word-of-mouth interactions and through online sources, which is an

actionable insight for local retailers looking for marketing and communication strategies for new and prospective customers.

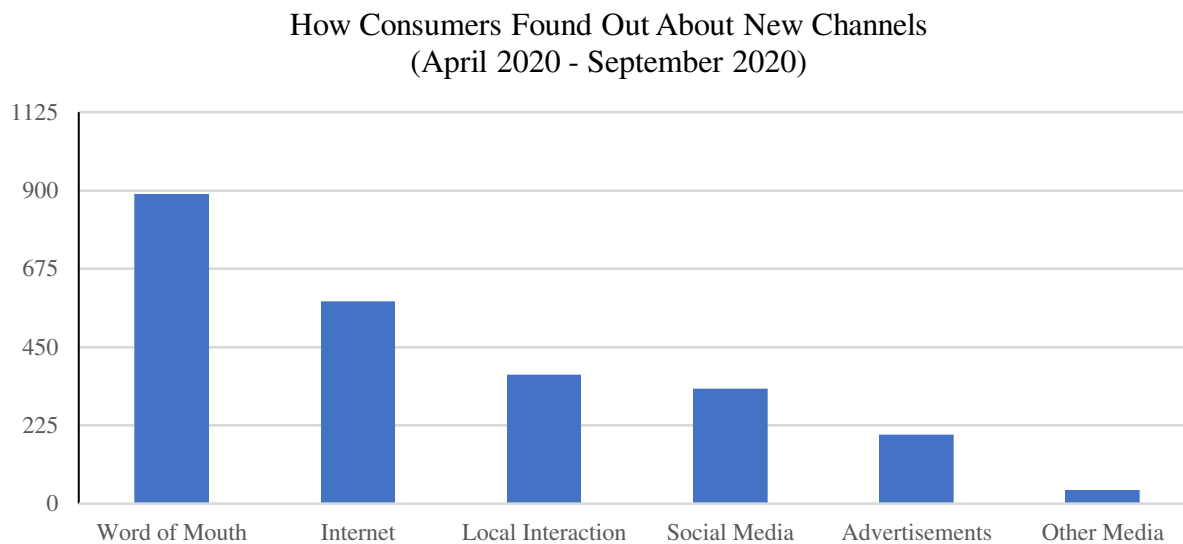


Figure 1. “How Consumer Found Out About New Channels” *This figure shows the frequency of occurrence of ways survey respondents found out about the new business they used in local and regional market channels from April 2020 to September 2020. This graphic is based on the original of Dr. Sarah Rocker, presented during the “Consumer Food Insights: Data to Guide Markets Beyond the COVID-19 Era” in April 2020 (LFS COVID April Webinar 2021).*

As mentioned, this survey utilized question language from existing, validated survey instruments, as adapted existing questions to meet the unique needs to the survey goals to accommodate disaggregated market channel questions, COVID-19 questions, and expanded set of food values and perceived consumer effectiveness (PCE) questions. Table 3 describes each survey section and the source of question language.

Table 3: Survey Questions and Sources: Market Channel Use and Future Intentions

| Survey Section     | Question                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Source                                                                                               |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Market Channel Use | <p>For the following time periods (September 2020, April 2020, and September 2019), did you purchase food from any of the following places? (check all that apply)</p> <ul style="list-style-type: none"> <li>• Supercenter and wholesale (e.g., Walmart, Costco)</li> <li>• Supermarket and grocery (e.g., Safeway, City Market, Albertsons)</li> <li>• Health/natural supermarket (e.g., Whole Foods, Natural Grocers)</li> <li>• Convenience store/corner store (smaller stores with limited selection) (e.g., 7-11)</li> <li>• Discount store (e.g., Dollar Store, Aldi)</li> <li>• Smaller format grocery store (e.g., independent grocery store, food co-op, Trader Joe's)</li> <li>• Farmers market</li> <li>• Direct-from-producer (other than farmers market) (e.g., CSA, farm stand, ordering online from producer)</li> <li>• Food box (e.g. sourced from many farms/producers; picked up at food hub or delivered to home)</li> <li>• Meal/M meal Kit Delivery Service (e.g., Blue Apron, Schwanns)</li> <li>• Bakery, deli, meat, or fish market (gourmet or ethnic)</li> <li>• Large, national restaurant chains (e.g., Wendy's, Applebees)</li> <li>• Local, independent restaurant</li> </ul> | Categories adapted from USDA Food Aps and Colorado Public Attitudes Survey                           |
| Future Intentions  | During the next year, do you expect that you/your household will purchase more, about the same, or less food from this type of retailer than you do now?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Language adapted from Consumer Confidence Index and University of Michigan Consumer Sentiment Survey |

## CHAPTER 4: NEW AND FUTURE USE OF LOCAL MARKETS

### 4.1 Conceptual Framework: Household Indifference Curves

If we consider a consumer's choice as a decision between a bundle of two “goods”—items purchased at local or alternative channels and items purchased at traditional market channels—we can apply the concept of an indifference curve, where consumers maximize their utility with a certain combination of local and traditional market channel use, subject to their budget constraint. This model framework is characterized by the idea that consumers make decisions by maximizing their individual utility curve, and their choice of one alternative over another, like shopping at a particular market channel, is an outward expression of their “underlying utilities” (Walk and Ben-Akiva 2002). For this type of model, an individual is selecting one of a set of alternative combinations of channel usage.

COVID-19 may have impacted the shape, level and choice among household indifference curves in a number of ways: changes to household budget lines due to income changes; changes in relative costs of shopping in certain channels; or, changes to the shapes of their indifference curves as a result of preferences being changed by the major, long-lasting shock such as COVID-19. The following section describes possible household behavior shifts related to changes in income, changes in indirect costs, and changes in preferences, that illustrates shifts in consumer preference for local and traditional channels during COVID-19 that may underlie the empirical analysis and discussion that will follow.

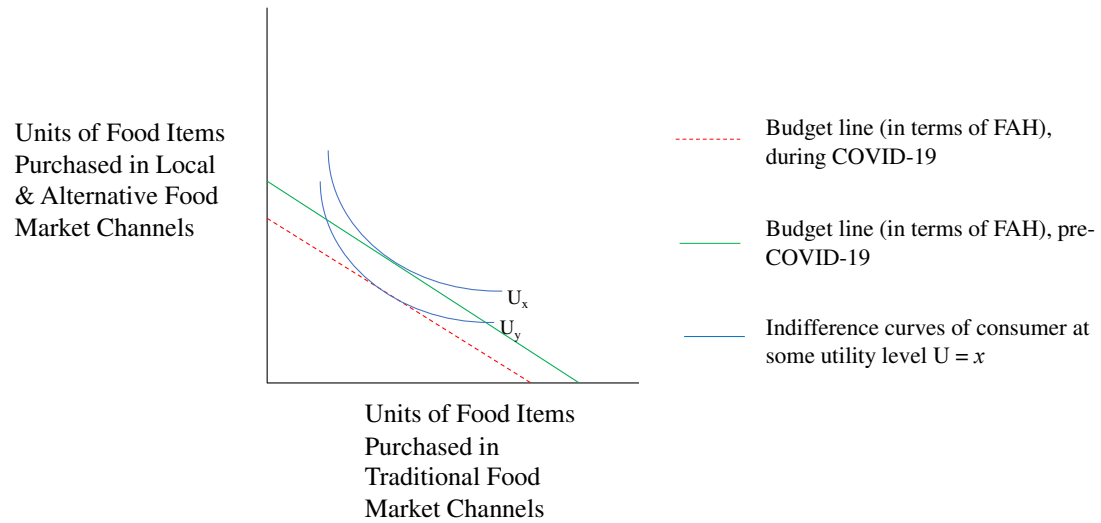
#### *4.1.1 Changes in Income During COVID-19*

Some households may have experienced an increase or decrease in income during COVID-19 due to job loss, changes in pay, and furloughs. This change in income affects the household budget line directly, shifting their bundle to a higher or lower indifference curve depending on their income change. This shift in consumption of local and traditional channels due to a direct impact on household income and food budget is depicted in Figure 2.

#### *4.1.2 Changes in Relative Costs of Local or Traditional Market Channels*

Another scenario in which a household's budget line shifts is that the relative cost of one or more "goods" has changed. Several factors may have led consumers to perceive the "costs" of local or traditional market channels to change during COVID-19. COVID-19 risk is one of these nonpecuniary costs that we want to explore. Some consumers may have perceived local channels as high risk, perhaps due to greater number of trips required to acquire necessary food items, or less online and contactless purchasing infrastructure compared to traditional channels. Alternatively, some consumers may have perceived traditional market channels as high risk due to greater number of shoppers in a supermarket, for example. In any case, the perception that a market channel type (local/alternative vs. traditional) now carries a greater indirect cost may have shifted the household budget line, thus shifting their preferred bundle of market channel use. In our analysis, we try to capture a consumer's relative exposure or perception of this risk-cost factor by soliciting information on the respondents' exposure to COVID-19, perceived risk of COVID-19 illness, and attitudes towards safety protocols and public health considerations like reducing the spread of COVID-19.

*2a: Decreased Household Budget Line due to Negative Impact on Employment/Income*



*2b: Increased Household Budget Line (Positive Impact on Employment/Income)*

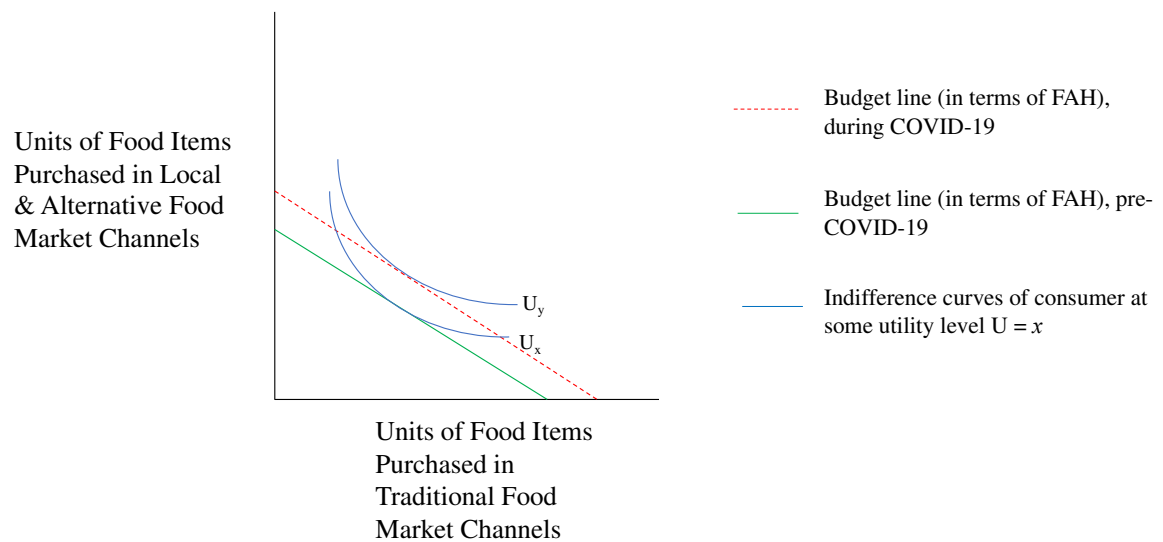
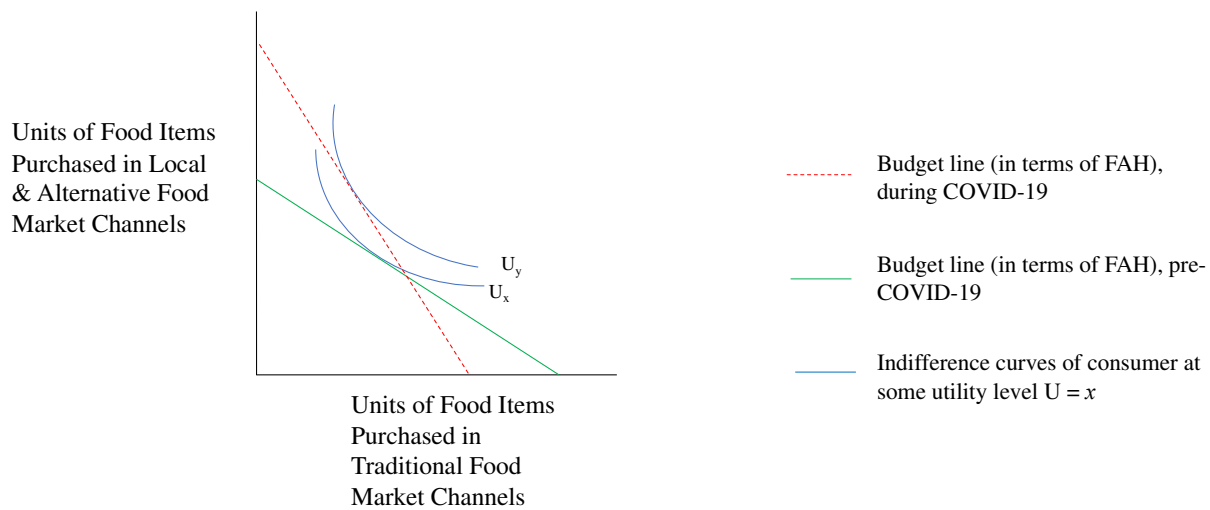


Figure 2: Shift to New Market Channel Bundle Due to Change in Income (Budget Line Shift). 2a depicts impacts to the budget line with a negative impact on employment or income, while 2b depicts impacts of a positive impact.

The relative value of time is another nonpecuniary cost that may have shifted due to COVID-19 and indirectly affected household budget lines. Local channels, like farmers markets and direct-from-producer markets, may be perceived as more costly in terms of time use and convenience since these channels are not open every day of the week and may not have all the necessary food items desired, unlike a traditional grocery store that allows for “one stop shopping”. During COVID-19, as consumers’ time may have been affected by changes in employment, working circumstances, and schooling options for children in K-12 education. In addition, the time it takes to shop at certain channels may have changed in relative terms during COVID-19, with shifts in shopper capacity at certain retailers, product availability due to supply chain shocks, and the increased ability or willingness to use online methods to purchase food. As with the indirect risk costs mentioned previously, the direction of the shift—towards local and away from traditional, or vice versa—depends on the consumers’ circumstances and perceptions. In our analysis, we capture information related to this time-cost factor with variables that account for changes in employment and income during COVID-19, as well as consumers’ attitudes related to purchasing options (i.e. online, delivery, and curbside options). Both possible budget line shift scenarios are depicted in Figure 3.

### 3a: Shift Towards Local & Alternative Market Channels



### 3b. Shift Towards Traditional Market Channels

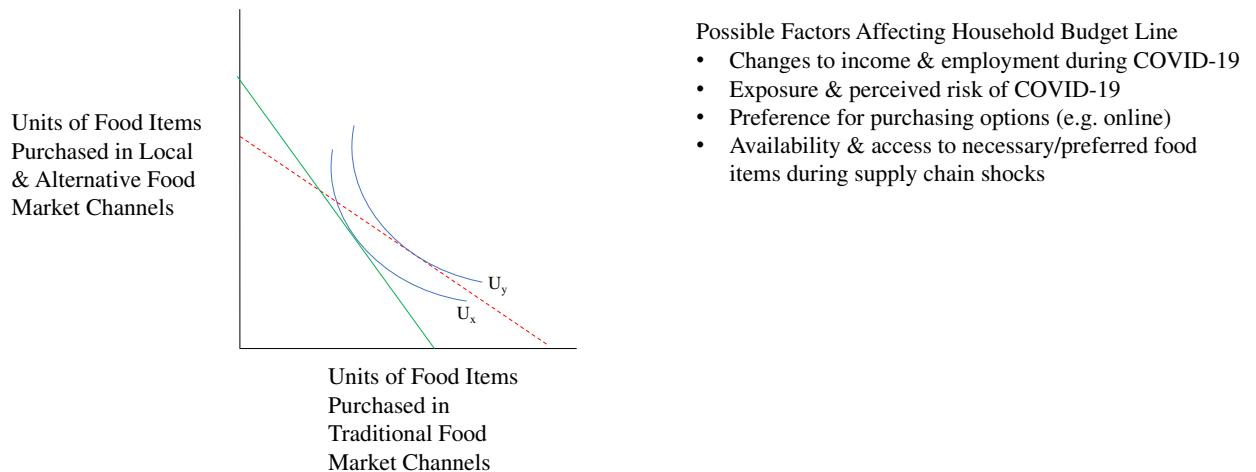


Figure 3. Shift to New Market Channel Bundle Due to Change in Costs (Budget Line Shift): These graphs illustrate shifts in budget line due to changing costs of a good, which in this case is actually the market channel itself. 3a depicts budget line shifts local and alternative channels, while 3b depicts shifts toward traditional market channels.

#### 4.1.3 Changes in Household Preferences

Another scenario that may have occurred during COVID is shifting household preferences, which impact the optimal local-traditional food purchasing bundle. Consumers' indifference curves represent bundles of goods between which the consumer is indifferent, with the slope of the indifference curve representing the marginal rate of substitution between the two

goods. With a large-scale shock like the COVID-19 pandemic, it is reasonable to conceive of a shift in consumer preferences, perhaps based on attitudes or values related to food and food shopping because of increased awareness of food supply chain dynamics and/or personal experiences with gaining access to food in various markets.

Such a potential shift is illustrated as a change in the household indifference curve, as opposed to a change in the household budget line. The optimal bundle by which the household maximizes utility shifts, while maintaining the initial budget constraint. Figure 4 depicts this scenario of a shift in consumer preference towards local and alternative markets. The steepness of the household indifference curve represents a higher rate of marginal substitution between local and alternative market channel purchases and traditional market channel purchase.

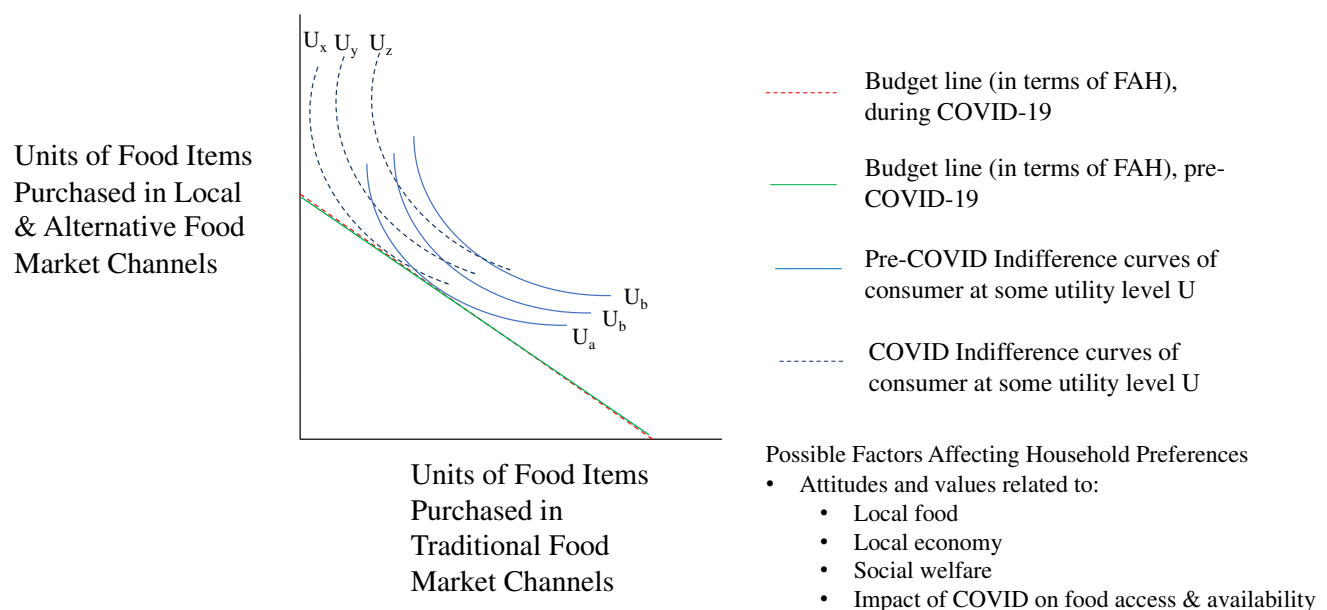


Figure 4. Changes in Household Preferences—Shifting Shape of Indifference Curve

These budget line and indifference scenarios provide a conceptual framework through which to understand the heterogeneous changes in consumer behavior during COVID-19. Because

there were many possible factors influencing not only consumers' budget lines, but also their overall preferences, this framework allows us to consider all of these scenarios within the context of a seminal consumer behavior framework. While not depicted in the above scenarios, we can also conceive of a class of consumers whose budget line and preferences remain unchanged, which suggests they did not change their behavior during COVID-19 related to their optimal bundle of local and traditional market channels.

## **4.2 Applying the Theory of Planned Behavior**

To relate the above indifference curve framework for consumer preferences to the shifts underlying changes in behavior we introduce a theory that may guide such behavioral changes. The Theory of Planned Behavior (TPB), originating from the psychology literature, asserts that values and attitudes, perceived behavioral control (PBC), and subjective norms are predictors of behavior and intention (Ajzen 1991). In this context, attitudes, which we will refer to now as values or food values, are “the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question” (Ajzen 1991). In other words, we want to capture how strongly consumers feel, positively or negatively, about a behavior. Perceived behavioral control (PBC) refers to “the perceived ease of difficulty of performing the behavior” in question (Ajzen 1991).

For our purposes, we will use an extension of PBC called Perceived Consumer Effectiveness (PCE) which has been used in consumer contexts to bridge the “attitude-behavior gap,” and refers to “the extent to which the consumer believes that his personal efforts can contribute to the solution of a problem” (Vermeir and Verbeke 2006). Subjective norms are the third component of the TPB framework and refer to external influencers such as “the perceived

social pressure to perform or not to perform the behavior” (Azjen 1991). This comprehensive framework addresses the fact that attitudes alone may not be a good predictor of behavior, but rather, also including subjective norms and PBC indicators can reflect a more complete framework of consumer behavior (Kraus 1995). TPB is also consistent with the risk and time factors, discussed above, that may affect behaviors based on changing perceptions.

We utilize a series of Likert scale questions from our 2020 consumer survey to capture the elements of the framework, including food values (“attitudes”), PCE (“perceived behavioral control (PBC)”), and social norms (“subjective norms”). The TPB framework has been applied to consumer preference and behavior in the food sector, including intention to participate in sustainable dairy consumption (Vermeir and Verbeke 2008) and consumer willingness to pay for sustainability attributes like “organic” and “local” in fresh produce (Nurse, Thilmany, and Onazaka 2011). This study does expand the existing values, norms, and PCE questions included in previous studies to better align with the evolving nature of potential drivers of consumer shopping behavior during COVID-19. Specifically, this study aims to capture factors that are known to predict consumer behavior and purchasing decisions, and newly incorporates uniquely relevant factors, like public health and economic disruptions, which are critical in understanding the dynamic of consumer behavior during COVID-19 in 2020.

#### *4.2.1 Disentangling short- and long-term behavioral change*

Understanding consumers using new businesses in local market channels is important information for local food retailers. However, a consumer’s one-time use of a new business does not necessarily indicate that their new behavior will persist into the future. Still, this future behavior is of particular interest to local retailers and food systems partners, as it provides

insights about which of these new customers will continue shopping at local channels beyond the timeframe of the initial impact of the COVID-19 pandemic and may ultimately inform marketing and retail strategies intended to maintain this new customer base. Therefore, we investigate both which consumers are using channels *and* whether they intend to shop at those channels more in the future, which captures the potential persistence of new consumer behaviors.

In the food marketing literature, product differentiation is often broken down into two categories: horizontal differentiation and vertical differentiation. In vertically differentiated product markets, consumers share the “same ordinal ranking” of products in that space, with an example being ratings for cuts of beef, like prime or choice (Lusk, Roosen, and Shogren 2012). In horizontal differentiation, consumers do not share any ordinal ranking of products, but may prefer one product over another for its various attributes, which could include products that are sustainably or locally produced. While this framework of product differentiation assumes that individuals are selecting only one product out of a choice set of differentiated products, we can apply this general concept of horizontal differentiation to the consumer preferences for differentiated market channels by looking at their use of these channels during COVID-19.

We expand upon existing research related to preferences for “local” by integrating explanatory variables that are unique and align with what was learned from COPCO partner conversations including: consumer respondents’ attitudes and values related to food systems, perceived consumer effectiveness (PCE), and what could be learned about the respondents’ concerns about social norms. We also include variables related to the food market disruption itself—COVID-19 exposure, perceived risk of COVID-19, changes in income and working status during the pandemic—to capture factors related to personal and public health and income that may impact an individual’s shopping habits. We incorporate disruption, values, PCE, and

cultural and local norm variables following the aforementioned TPB framework, allowing us to assess the extent to which values and beliefs affect an individual's likelihood of adopting a local or regional market channel behavior during COVID-19 (Figure 5).

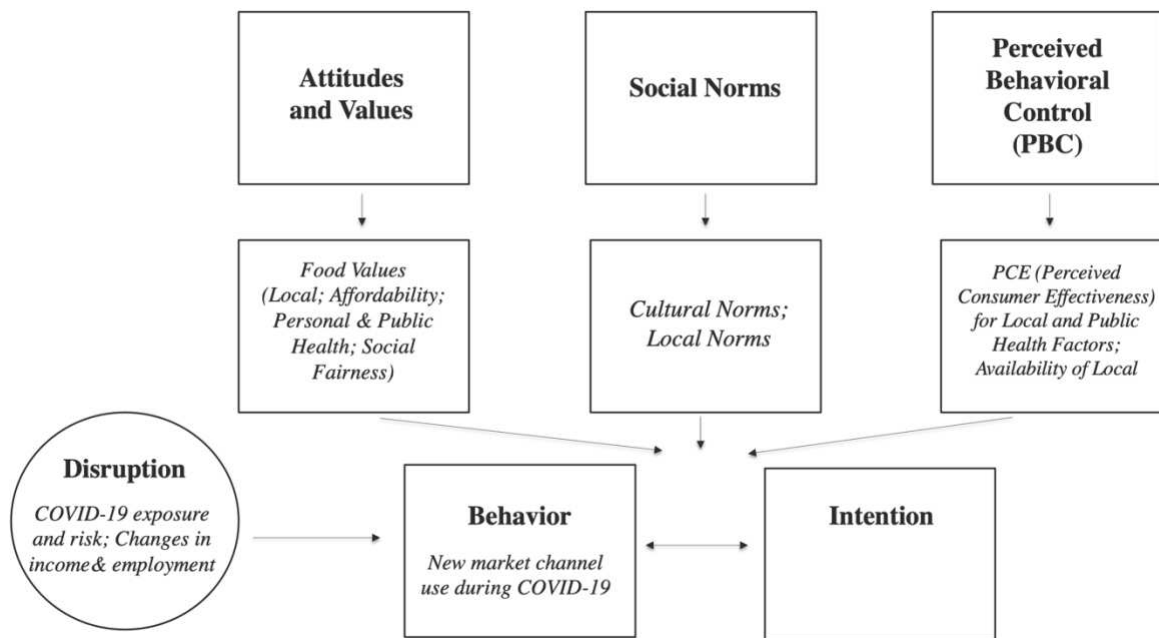


Figure 5. *Conceptual Framework for Use of Local Market Channels During COVID-19.* This framework is adapted from the traditional Theory of Planned Behavior Framework and Vermeir and Vebecke's (2006) adaptation for sustainable food products. Bold factors are broad construct themes in the Theory of Planned Behavior and italicized sections represent factors included explored in this study to reflect recent events and research questions.

Lusk and Briggeman (2009) show that food values, which capture more abstract concepts influencing consumers' purchasing decisions, such as "environmental impact" or "nutrition" tend to be more stable over time than preferences for specific attributes or products. Knowing this information, we can assume, to some extent, that food values are relatively stable. For example, the average consumer is unlikely to shift from thinking that "local" is "Very Important" to

thinking it is “Very Unimportant” in their food purchasing decisions during the COVID pandemic. Capturing responses on a more detailed list of values, norms, and disruption risks will allow us to see whether the observed growth in local market participation was due to existing shoppers and individuals who highly value local food using more local channels, versus discovering if there were new shoppers, less fully aligned with local foods initially, who now began shopping at local channels for a variety of reasons.

In addition to the TPB variables—attitudes, social norms, and perceived behavioral control—we also include food values variables that are known to influence consumers’ preferences, including price and convenience (Lusk and Briggeman 2009). Because the behavior changes that we are interested in occurred during the COVID-19 pandemic, we also include variables to control for impacts of COVID-19, including perceived health risks due to COVID-19 (whether a respondent perceives themselves to be at high risk of developing COVID-19 complications), COVID-19 exposure (whether the respondent has tested positive for COVID-19), and income changes during COVID-19 (loss of job, loss of income, etc. during COVID-19). We also include a vector of demographic variables, including age, income, race, and whether or not the household has any children under the age of 18. The outcome variable of interest in the first section of our analysis is: individuals’ reported use of one or more new local market channel enterprises between April 1, 2020 and September 30, 2020 (as reported in October 2020).

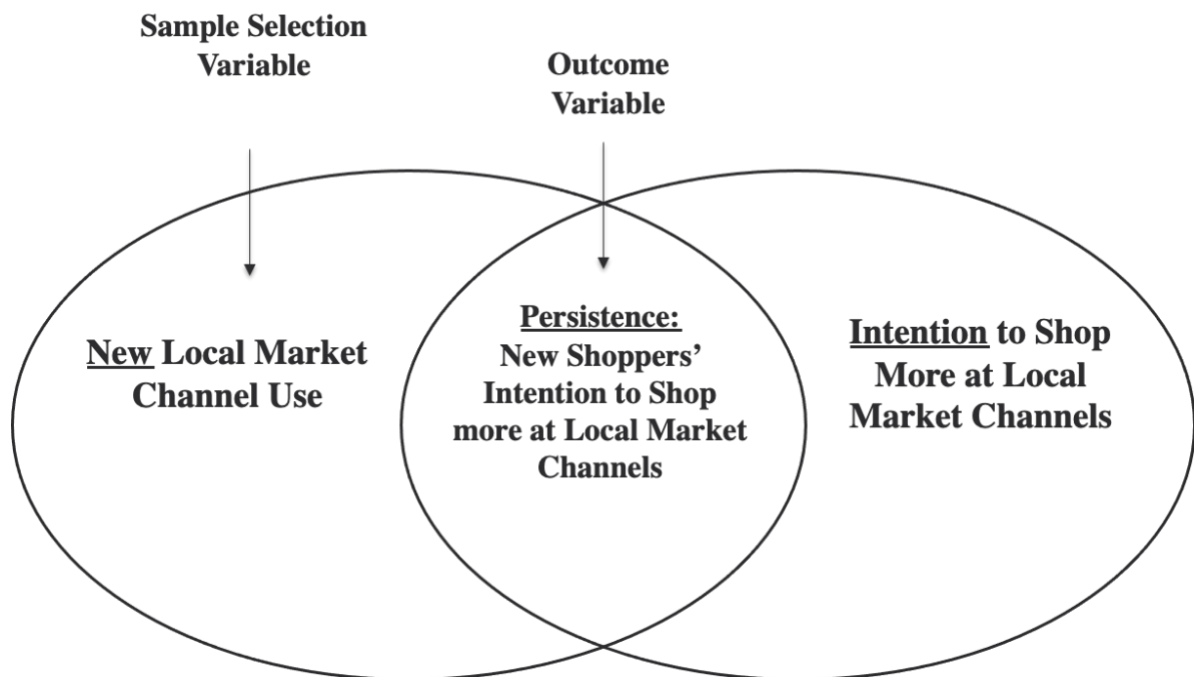
### **4.3 Model Specification**

We use a Heckman probit selection model to capture the effects of the TPB factors described above on an individual consumer's likelihood of shopping at a new local channel during COVID-19. Our selection variable of interest is in whether or not a consumer shopped at a new business in a local or alternative market channel from April 2020 to September 2020, and our regression variable is the respondent's stated intention to use local market channels more in the future. Because these behaviors can be easily represented as binary variables, we can implement a probit selection model, with hypothesized motivations of behavior as explanatory variables in both stages. As described above, we include a few key categories of behavioral drivers in our model based on existing consumer choice and local food systems literature described previously, including; local and social benefit outcomes, affordability, availability, as well as perceived economic and health risks. An individual's food values, PCE, and social norm responses represent the suite of factors that may influence their inclusion in the two stages of our selection model: 1) decision to shop at a new business in a local market channel, and 2) intent to shop at local market channels more in the future.

The selection stage variable in the following model is the binary variable of whether or not the respondent shopped at a business for the first time between April and September 2020 in the one or more of the following local/alternative market channels: 1) local and alternative food-at-home channel (farmers market, direct-from-producer, CSA, gourmet/artisan retailer, food box), and 2) *direct* local channel was used during COVID (farmers market, direct-from-producer purchase, CSA). As a form of robustness check, we use both a broad and a narrow definition of "local" market channels to account for COVID-19 trends reported by food systems partners, with increases in CSA and farmers market participation, as well as the increased interest in small and specialty grocers (CSA Listening Session 2020, Farmers Market Listening Session 2020, NGA

Listening Session 2020, Independent Restaurant Listening Session 2020). The more traditional definition of local, direct-to-consumer market channels includes farmers markets, CSAs, and direct-from-producers purchases like farm stands, which are used in the Local Food Marketing Practices Survey (USDA NASS 2016). A broader definition of local includes alternative markets that carry local food items (and that were newly included in the USDA project’s community of practice), as well as “local” food businesses that tend to be owned and operated independently, which includes the direct channels listed above as well as food boxes, and gourmet and specialty retailers (butchers, artisan markets, bakers). The outcome variable in the regression stage of the Heckman Probit selection model is persistence, which is represented by new shoppers (from the selection stage) who also intend to shop more at local channels in the future. A depiction of the overlapping groups of questions is depicted in Figure 6 below.

Figure 6: Heckman Probit Selection Model for New and Persistent Local Market Channel Use



Of the 5,000 total responses, the subsample that meets the above selection criteria total 808 (16.2%) for new, direct local markets and 1,221 (24.4%) for all new local, food-at-home markets. The following two models include result for the explanatory variables grouped into three broad categories: 1) demographics; 2) COVID-19 related factors; and 3) food values, PCE, and social norms construct variables from the Theory of Planned Behavior conceptual model. Age and income are included as ordinal variables, with each level representing a one-category increase in the group of age (grouped by 10-year categories) or income (grouped by \$10k categories) to which the consumer belongs. Reference groups for the following categorical dummy variables are: Race-White; Cov – combined “Definitely did not have COVID,” “I don’t know,” and “Prefer not to answer”; Covrisk – No risk, I don’t know, and Prefer not to answer; Covinc – No change in employment or income.

Best practice for use of Likert scale data in regression analysis is collapsing items into scales of similar questions using factor analysis, where multiple questions can be combined into single factor values that can be used as independent variables in analysis (Brown 2015). We conducted a confirmatory factor analysis (CFA) which included three factors of Likert scale questions sharing the following key themes—Local Food and the Local Economy; Social Fairness and Equity; and Public and Personal Health. These Likert scale questions and themes are adapted from existing consumer food preferences research that also applied TPB to consumer preferences for local (Rainbolt, Onazaka, McFadden 2012). Results of several key goodness of fit tests suggest an poor overall model fit. The chi-squared likelihood ratio test ( $p\text{-value} = > 0.000$ ) suggests the saturated model is better fit to the data than our model, which suggests poor model fit. In addition, the root mean squared error of approximation (RMSEA) test result of 0.089 indicates poor fit of the model to the data and above the acceptable fit threshold of 0.08.

The pclose test of model fit is also statistically significant ( $p\text{-value} = >0.000$ ) which indicates that the model deviates significantly from close fit of an RMSEA value of 0.05. Two other tests—comparative fit index (CFI) and standardized root mean squared residual (SRMR)—suggest acceptable fit, but not strong fit, with values of 0.940 and 0.040, respectively (Kline 2016). These model fit results are decidedly contradictory and do not indicate good overall model fit of our hypothesized CFA. While factor analysis is the most common analysis tool for Likert-scale data, our CFA of food values and PCE data collected in the survey produced inconclusive results, leading us to decide against the use of factor analysis in the following regression analysis.

Instead of using factor analysis scale values as our independent variables, we include each PCE and food value variable as its own unique variable. These are summarized in Table 4 and Table 5 below. In our case, the confirmatory factor analysis results indicate that each Likert scale questions used in our survey elicited distinct, heterogeneous responses such that that they cannot be confidently collapsed into scales of like-items as we had originally anticipated. When Likert-scale data cannot be collapsed into factors, a few options exist. One alternative approach is to treat Likert scale data as an interval scale, which requires an assumption of normality and that this strategy is often more useful for Likert type data with a greater number of choices (e.g., 11-point Likert scale of 0 to 10) provides a “better approximation of an interval scale and normality” (Hodge and Gillespie 2017; Wu and Leung 2017). Because our Likert type questions were on a 7-point scale and our central tendencies (median) tended to be in the range of 5 to 6, as opposed to 4, we cannot assume normality and do not treat these data as interval.

The Likert-type data used in this analysis has been transformed to binary variables, where “1” represents a response greater than the central tendency of the sample for each attitude

and PCE. The median response value is the appropriate central tendency for data of an ordinal, categorical nature (Lovelace and Brickman 2013). While dimensionality and data richness are lost in transforming Likert-scale data into binary variables, it can be a viable alternative if there is a compelling data-driven reason for doing so, which are mentioned above (Lovelace and Brickman 2013).

Table 4. Overview of Food Values Likert-Type Questions

| Statement                                                                                                                                                                                  | Construct Type | Variable Name   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|
| <i>FV Statements: Suppose you are shopping for food and are deciding what to buy. Please indicate how important the following factors are in your decision (check one for each). (1-7)</i> |                |                 |
| <i>...that I feel confident in the safety protocols of the retailer/store where I am shopping.</i>                                                                                         | Attitudes      | fv_protocols    |
| <i>...that I have options about my purchasing method (e.g. online ordering, delivery, in-store pickup, etc.)</i>                                                                           | Attitudes      | fv_options      |
| <i>...that it is locally grown.</i>                                                                                                                                                        | Attitudes      | fv_locallygrown |
| <i>...that it supports the local economy.</i>                                                                                                                                              | Attitudes      | fv_localecon    |
| <i>...that my purchase supports the food business that I am buying from.</i>                                                                                                               | Attitudes      | fv_fb support   |
| <i>...that it meets my traditional/cultural preferences.</i>                                                                                                                               | Attitudes      | fv_cultural     |
| <i>...that my purchase supports businesses owned and operated by historically underrepresented groups (African American, Hispanic, Native American, people of color)</i>                   | Attitudes      | fv_underrep     |
| <i>...that it is affordable.</i>                                                                                                                                                           | Attitudes      | fv_afford       |
| <i>...that it has been produced and handled by people I know and trust.</i>                                                                                                                | Attitudes      | fv_trust        |

Table 5. Overview of PCE Likert-Type Questions

| Statement                                                                                                                      | Construct Type   | Variable Name   |
|--------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
| <i>PCE Statements: Please read each statement and check the number that best describes your feeling. (1-7)</i>                 |                  |                 |
| <i>I would be willing to make personal food consumption sacrifices in consideration of public health concerns of COVID-19.</i> | PCE              | pce_sacrifices  |
| <i>Doing my part to reduce the spread of COVID-19 is important to me.</i>                                                      | PCE              | pce_covspread   |
| <i>COVID restrictions impacted what, where, and how I buy food.</i>                                                            | PCE              | pce_covshopping |
| <i>COVID disruption has affected my ability to buy food to meet the same dietary quality that I had 1 year ago.</i>            | PCE              | pce_covdiet     |
| <i>I believe that what I choose to buy and where I choose to buy food can have an impact on the local economy.</i>             | PCE              | pce_localecon   |
| <i>I believe local food products are easily available.</i>                                                                     | PCE/Availability | pce_localavail  |
| <i>People who are important to me think I should buy local food products.</i>                                                  | Social Norms     | pce_localpeers  |

Table 6a. Heckman Probit Results for New &amp; Persistent Use of Local Markets (Selection Stage)

| <b>Variable</b>                               | <b>All New Local FAH Markets<br/>(Farmers Market, CSA, Direct<br/>from Producer,<br/>Gourmet/Artisan, Food Box)</b> | <b>New Direct Markets<br/>(Farmers Market, CSA,<br/>Direct from Producer)</b> |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Wald chi <sup>2</sup><br>(Prob > chi2)        | 88.68<br><0.0000***                                                                                                 | 59.15<br>0.0001***                                                            |
| Selected Observations                         | 1,221                                                                                                               | 808                                                                           |
| <b>Selection Stage: New Channel Use</b>       |                                                                                                                     |                                                                               |
| <b>Demographics</b>                           | <b>Probit Marginal Effects</b>                                                                                      |                                                                               |
| Age (ordinal)                                 | -0.045***<br>(0.004)                                                                                                | -0.022***<br>(0.003)                                                          |
| Income (ordinal)                              | 0.008***<br>(0.002)                                                                                                 | 0.004***<br>(0.001)                                                           |
| <i>Race</i>                                   |                                                                                                                     |                                                                               |
| Black                                         | 0.027<br>(0.019)                                                                                                    | -0.011<br>(0.013)                                                             |
| Asian                                         | -0.039<br>(0.027)                                                                                                   | -0.046**<br>(0.018)                                                           |
| Alaska Native; American<br>Indian             | 0.053<br>(0.041)                                                                                                    | 0.027<br>(0.031)                                                              |
| Native Hawaiian; Other<br>Pacific Islander    | 0.096<br>(0.060)                                                                                                    | 0.001<br>(0.038)                                                              |
| Children Under 18 in<br>Household             | 0.059***<br>(0.014)                                                                                                 | 0.040***<br>(0.011)                                                           |
| <b>COVID-19 Specific Factors</b>              |                                                                                                                     |                                                                               |
| <i>COVID-19 Exposure &amp; Risk</i>           |                                                                                                                     |                                                                               |
| Definitely had COVID-19,<br>was tested        | 0.085***<br>(0.024)                                                                                                 | 0.098***<br>(0.021)                                                           |
| Probably had COVID-19, not<br>tested          | 0.053**<br>(0.023)                                                                                                  | 0.074***<br>(0.020)                                                           |
| Probably did not have<br>COVID-19, not tested | -0.036**<br>(0.014)                                                                                                 | -0.011<br>(0.011)                                                             |
| High risk of COVID-19                         | 0.019<br>(0.014)                                                                                                    | 0.016<br>(0.011)                                                              |
| <i>Changes in Income during<br/>COVID-19</i>  |                                                                                                                     |                                                                               |
| Decreased Hours/Income                        | 0.043***<br>(0.013)                                                                                                 | 0.037***<br>(0.011)                                                           |
| Increased Hours/Income                        | 0.083***<br>(0.032)                                                                                                 | 0.110***<br>(0.029)                                                           |

\*\*\* p &lt; 0.01, \*\* p &lt; 0.05, \*p &lt; 0.1

Table 6b. Heckman Probit Results for New & Persistent Use of Local Markets (Selection Stage Results continued)

| <b>Variable</b>              | <b>All New Local FAH Markets<br/>(Farmers Market, CSA, Direct from Producer,<br/>Gourmet/Artisan, Food Box)</b> | <b>New Direct Markets<br/>(Farmers Market, CSA,<br/>Direct from Producer)</b> |
|------------------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| <b>Food Values &amp; PCE</b> | <b>Probit Marginal Effects</b>                                                                                  |                                                                               |
| Fv_Protocols                 | -0.030**<br>(0.015)                                                                                             | -0.020*<br>(0.012)                                                            |
| Fv_Options                   | 0.049***<br>(0.015)                                                                                             | 0.012<br>(0.011)                                                              |
| PCE_sacrifices               | 0.007<br>(0.015)                                                                                                | -0.001<br>(0.011)                                                             |
| PCE_covspread                | -0.026*<br>(0.015)                                                                                              | -0.020*<br>(0.011)                                                            |
| PCE_covshopping              | 0.001<br>(0.014)                                                                                                | -0.009<br>(0.011)                                                             |
| PCE_covdiet                  | 0.096***<br>(0.014)                                                                                             | 0.062***<br>(0.011)                                                           |
| Fv_locallygrown              | 0.051***<br>(0.017)                                                                                             | 0.042***<br>(0.013)                                                           |
| Fv_localecon                 | 0.010<br>(0.016)                                                                                                | 0.002<br>(0.012)                                                              |
| Fv_fb support                | 0.027*<br>(0.016)                                                                                               | 0.017<br>(0.012)                                                              |
| Fv_cultural                  | 0.072***<br>(0.016)                                                                                             | 0.051***<br>(0.012)                                                           |
| Fv_underrep                  | 0.024<br>(0.017)                                                                                                | 0.025**<br>(0.013)                                                            |
| Fv_afford                    | -0.079***<br>(0.014)                                                                                            | -0.056***<br>(0.010)                                                          |
| Fv_trust                     | -0.026<br>(0.015)                                                                                               | -0.010<br>(0.012)                                                             |
| Pce_localecon                | 0.017<br>(0.017)                                                                                                | 0.006<br>(0.013)                                                              |
| Pce_localavail               | 0.013<br>(0.015)                                                                                                | 0.024**<br>(0.012)                                                            |
| Pce_localpeers               | 0.065***<br>(0.015)                                                                                             | 0.059***<br>(0.011)                                                           |
| Constant                     | -0.876***<br>(0.099)                                                                                            | -1.466***<br>(0.113)                                                          |

\*\*\* p < 0.01, \*\* p < 0.05, \*p < 0.1

Table 6c. Heckman Probit Results for New & Persistent Use of Local Markets (Regression Stage Results)

| <b>Variable</b>                                                                             | <b>All New Local FAH Markets</b><br>(Farmers Market, CSA, Direct from Producer, Gourmet/Artisan, Food Box) | <b>New Direct Markets</b><br>(Farmers Market, CSA, Direct from Producer) |
|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| <b>Second Stage Variable of Interest: More Intended Future Use of Local Channels</b>        |                                                                                                            |                                                                          |
| <i>LR Test of Independent Equations (Prob &gt; chi2)</i>                                    | 0.191                                                                                                      | 0.054**                                                                  |
| <i>atrho</i>                                                                                | 0.119                                                                                                      | 0.039                                                                    |
| <b>Demographics</b>                                                                         | <b>Marginal Effects</b>                                                                                    |                                                                          |
| Children Under 18 in Household                                                              | 0.062<br>(0.039)                                                                                           | 0.024<br>(0.044)                                                         |
| <b>COVID-19 Specific Factors</b>                                                            |                                                                                                            |                                                                          |
| Definitely had COVID-19, was tested                                                         | 0.073<br>(0.050)                                                                                           | -0.025<br>(0.052)                                                        |
| Probably had COVID-19, not tested                                                           | 0.090*<br>(0.039)                                                                                          | -0.022<br>(0.054)                                                        |
| Probably did not have COVID-19, not tested                                                  | 0.058<br>(0.098)                                                                                           | 0.059<br>(0.043)                                                         |
| High risk of COVID-19                                                                       | 0.099***<br>(0.034)                                                                                        | 0.065<br>(0.039)                                                         |
| <i>Changes in Income during COVID-19 (reference group = no change in income/employment)</i> |                                                                                                            |                                                                          |
| Decreased Hours/Income                                                                      | 0.098**<br>(0.038)                                                                                         | 0.033<br>(0.044)                                                         |
| Increased Hours/Income                                                                      | 0.156**<br>(0.066)                                                                                         | 0.006<br>(0.066)                                                         |
| <b>Consumer Confidence Index</b>                                                            |                                                                                                            |                                                                          |
| CCI_income_higher                                                                           | 0.068**<br>(0.032)                                                                                         | 0.005<br>(0.031)                                                         |
| CCI_time_more                                                                               | 0.217***<br>(0.038)                                                                                        | 0.164**<br>(0.067)                                                       |

Table 6d. Heckman Probit Results for New & Persistent Use of Local Markets (Regression Stage Results continued)

| <b>Variable</b>                                                                      | <b>All New Local FAH Markets</b><br><i>(Farmers Market, CSA, Direct from Producer, Gourmet/Artisan, Food Box)</i> | <b>New Direct Markets</b><br><i>(Farmers Market, CSA, Direct from Producer)</i> |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| <b>Second Stage Variable of Interest: More Intended Future Use of Local Channels</b> |                                                                                                                   |                                                                                 |
| <i>Food Values &amp; PCE (= 1 if response is greater than sample median)</i>         |                                                                                                                   |                                                                                 |
| Fv_Protocols                                                                         | 0.004<br>(0.042)                                                                                                  | 0.070*<br>(0.042)                                                               |
| Fv_Options                                                                           | 0.026<br>(0.039)                                                                                                  | -0.002<br>(0.037)                                                               |
| PCE_sacrifices                                                                       | -0.002<br>(0.094)                                                                                                 | -0.011<br>(0.038)                                                               |
| PCE_covspread                                                                        | -0.051<br>(0.039)                                                                                                 | -0.023<br>(0.041)                                                               |
| PCE_covshopping                                                                      | 0.024<br>(0.036)                                                                                                  | 0.032<br>(0.036)                                                                |
| PCE_covdiet                                                                          | 0.007<br>(0.044)                                                                                                  | -0.034<br>(0.042)                                                               |
| Fv_locallygrown                                                                      | -0.014<br>(0.040)                                                                                                 | -0.055<br>(0.040)                                                               |
| Fv_localecon                                                                         | -0.001<br>(0.039)                                                                                                 | -0.012<br>(0.040)                                                               |
| Fv_fbssupport                                                                        | -0.001                                                                                                            | -0.002<br>(0.040)                                                               |
| Fv_cultural                                                                          | -0.035<br>(0.038)                                                                                                 | 0.019<br>(0.043)                                                                |
| Fv_afford                                                                            | 0.004<br>(0.040)                                                                                                  | 0.066*<br>(0.037)                                                               |
| Fv_trust                                                                             | -0.042<br>(0.039)                                                                                                 | -0.084*<br>(0.048)                                                              |
| Pce_localecon                                                                        | 0.120***<br>(0.043)                                                                                               | 0.051<br>(0.044)                                                                |
| Pce_localavail                                                                       | 0.049<br>(0.037)                                                                                                  | 0.016<br>(0.039)                                                                |
| Pce_localpeers                                                                       | 0.065<br>(0.044)                                                                                                  | 0.006<br>(0.048)                                                                |

#### 4.4 Results and Discussion

Overall, the Heckman Probit selection model for direct local markets indicates that there is dependence between the two equations in the model. The LR test of independent equations, with a chi-squared probability of 0.054, indicates that we reject the null hypothesis of independence, a finding also confirmed by the significant Wald test statistic. This is not the case for the broader set of new, local food-at-home channels, in which we fail to reject the null hypothesis of independence between the selection stage and second stage of the model.

In the selection stage of the Heckman Probit model, which is primarily interested in whether or not a respondent participated in a local market channel in a new way, a number of demographic variables were significant for both the broad and narrow set of new, local market channel use. Age and income, both ordinal variables, were significant at the 1% level in both local market channel categories, with age having a negative coefficient and income having a positive coefficient. This indicates that with each jump to the next highest age group, predicted probability of new local market channel use decreases, with a marginal effect of -0.045 for the broader set of local channels and -0.022 for the narrower set of direct local channels. With income, each jump to a higher income bracket increases the predicted probability of new local market channel use, with a marginal effect of 0.008 and 0.004 for new use of the broader and narrower set of local channels, respectively.

Another significant demographic variable is whether or not there are children under the age of 18 in the household. This variable is positive and significant at the 1% level for both local market channel definitions, with marginal effects of 0.059 and 0.040 for the broader and narrow set of local market channels, respectively. Increases in at-home schooling likely impacted many families' food purchasing strategies and share of meals prepared at home, perhaps with local and

regional market channels best meeting unique needs of families with children. None of the race variables were highly significant, suggesting that race is not a main driver of consumers' adoption of new local food markets.

The age and income findings align with existing literature on the types of individuals who may be likely to use local market channels. As mentioned previously, there is a perceived premium of both direct costs of the food products at local channels, but also indirect time costs associated with shopping at such local and regional markets that commonly have limited hours of operation and limited product availability, as is the case with many farmers market and direct-from-producer retail options. This aligns with the finding related to income, where households of higher income are found to be more likely to shop at a new business in a local market channel during COVID.

Several key variables related to COVID-19 and local food are significant. The variables indicating household COVID-19 exposure—whether someone in their household definitely or probably had COVID-19 were both significant at the 1% level, and indicate an increase in the predicted probability of shopping at a new local market compared to the reference group (those who responded that they definitely did not have COVID). The respondents who “probably did not have COVID, but were not tested,” were significantly less likely to shop at a new business in a local market channel during COVID compared to the reference group.

In addition, both variables related to income changes during COVID-19 were positive and significant. Individuals responding that they experienced a negative income or employment event (furlough, job loss, decreased hours or income), but also, those responding they had a positive income or employment event (increased income or hours) due to COVID-19 both appear to have significant correlation at the 1% level with increased probabilities of new local market

channel use. A positive impact on income or employment has a marginal effect of 0.083 for the broader set of local channels and a marginal effect of 0.110 in the narrow set of direct, local channels. The magnitude difference may speak to the actual or perceived price premium of food purchased in direct market channels like farmers market and direct-from-producer channels. A negative impact on income or employment also has a positive effect of new market channel use, for both the broader and narrow definition of local market channels, with marginal effects of 0.043 and 0.037, respectively. Interestingly, these findings for both increased income *and* decreased income as positive and significant drivers perhaps suggest any type of disruption led a household to rethink how they purchased food. Although we know these households were impacted in a more direct way by COVID, we cannot infer much more about why they were more likely to participate in new, local market channel usage during COVID-19, so we leave further investigation to future studies.

Several food-related attitudes were also significant factors in a respondents' use of new local channels during COVID-19. Not surprisingly, respondents who highly value their food being locally grown showed a significant and positive impact on new local market channel use during COVID. The marginal effect for new, *direct* local markets was 0.042, compared to 0.051 for the broader category of new, local food-at-home channels. Respondents who highly value food options that meet their traditional/cultural preferences also showed a significant and positive impact on new local market channel use during COVID. Conversely, respondents who highly valued their food being affordable showed a significant and negative impact on the probability of shopping in a new local channel during COVID. This was true for both definitions of market channels, with a marginal effect of -0.079 for the broader set of local channels and -0.056 for the narrow set of direct, local channels. This aligns with the perceived higher costs of

food at local channels, following the same logic presented in the discussion on income effects presented above.

Among the PCE factors, respondents who highly agreed with the statement “COVID disruption has affected my ability to buy food to meet the same dietary quality that I had 1 year ago” showed a significant, positive impact on their probability of using new local channels during COVID. The marginal effects for the broader and narrow group of local market channels were 0.096 and 0.062, respectively. This reinforces the trend that individuals directly affected by COVID, or perceiving themselves as directly affected, were more likely to explore new market channel use.

There were also factors that were significant indicators for new use of direct local markets or local, food-at-home markets, but not for both, indicating meaningful difference between these two ways of defining “local channels.” For direct, local markets (farmers markets, direct-from-producer channels, and CSAs), households who highly agreed with the statement “I believe local food products are easily available” exhibited a significant, positive impact on their use of new direct markets during COVID. This variable was not significant for the broader definition of local market channels. Conversely, there was a significant, positive impact on the probability of new use of local food-at-home markets amongst respondents who highly valued “having options about [their] purchasing method (e.g. online ordering, delivery, in-store pickup, etc.)” which was not observed in the direct, local definition. This suggests that some new use was driven by the desire for shopping choices (such as online purchasing methods), which may have been more readily available among the broader definition of local channels beyond direct markets.

The results of the Heckman selection model confirm the hypothesis that an individual's value and perceived consumer effectiveness related to the local economy and their impact on it are significant in their intention to purchase more from local market channels in the future. Both of the variables capturing the perceived economic elements of local food systems, "fv\_localecon" and "pce\_localecon," are positive and significant in the outcome equation. This indicates that as an individual's Likert scale response increases (representing "importance" or "agreement" with each statement, for values and PCE, respectively), the predicted probability of persisting in new local market channels in the future also increases.

The second stage of the Heckman Probit model, where the dependent variable of interest is the persistence of these new shoppers, shows less conclusive findings. For direct, local channels, value of safety protocols is slightly significant, with a marginal effect of 0.070. Another slightly significant variables was in feeling strongly valuing "that [their food] was produced by people I know and trust" (fv\_trust), with a marginal effect of -0.084. The negative marginal effect of fv\_trust could be explained by the fact it may take time to establish knowledge and trust with vendors, and individuals who newly shopped at local channels may not have established these new relationships to a level where they would shop more in the near future.

The only highly significant variable in the second stage was whether the respondent perceives that they will have more time in the future for shopping and preparing food, with a marginal effect of 0.164. New local food consumers who anticipate having more time for food in the future, all else equal, are more likely to intend to shop more locally in the future. The finding related to perception of time aligns with the idea that for some consumers, local foods may have additional costs, including time and convenience costs. This finding is also true of the broader definition of local, food-at-home markets, as well. However, the Likelihood-ratio test to

determine whether the selection stage and second stage of the model are dependent indicates that the two stages may not be dependent for the broader definition of local channels, which makes the second stage findings less promising.

To further understand what may have led shoppers to use new channels, but not intend to shop at those channels more in the future, we conducted unpaired t-tests comparing the expenditure means of respondents from these two groups: 1) existing local shoppers (using local market channels in September 2019) who shopped from a new business in a local/alternative market channel and did not intend to shop more in the future, and 2) existing local shoppers (using local market channels in September 2019) who shopped from a new business in a local/alternative market channel and did intend to shop more in the future (table 4). This test is designed to understand whether existing shoppers who used new channels may already participate actively in local markets, and so at that “capacity,” may perceive no need to increase usage in the future. In other words, if they’re already spending a large share of their food budget in local channels, perhaps they feel there is little room for them to participate “more” in the future. This test was conducted for the broadest group of local market respondents.

Table 7. Do Existing Local Shoppers' Expenditures Affect Their Future Shopping Intentions?

|                                                                               |                | <b>EXISTING CONSUMERS in ALL LOCAL FOOD-AT-HOME MARKETS<br/>(Farmers Markets, Direct from Producer, Food Box, Gourmet)</b> |                                  |
|-------------------------------------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                                                               |                | New Only<br>(n = 182)                                                                                                      | New & Future Intent<br>(n = 291) |
| <b>Expenditure Shares at Local FAH Channels<br/>(September 2020)</b>          |                |                                                                                                                            |                                  |
|                                                                               | Mean           | 0.229                                                                                                                      | 0.275                            |
|                                                                               | Standard Error | 0.015                                                                                                                      | 0.010                            |
|                                                                               | t-test value   | 2.543                                                                                                                      |                                  |
| Ha: diff != 0                                                                 | Pr ( T > t )   | 0.0113**                                                                                                                   |                                  |
|                                                                               |                |                                                                                                                            |                                  |
| <b>Absolute Expenditure Shares at Local FAH Channels<br/>(September 2020)</b> |                |                                                                                                                            |                                  |
|                                                                               | Mean           | 54.330                                                                                                                     | 59.092                           |
|                                                                               | Standard Error | 4.623                                                                                                                      | 4.277                            |
|                                                                               | t-test         | 0.729                                                                                                                      |                                  |
| Ha: diff != 0                                                                 | Pr ( T > t )   | 0.4660                                                                                                                     |                                  |
|                                                                               |                |                                                                                                                            |                                  |

*Note: not all respondents reported their food expenditures (only 38.7% of respondents in the subset of new and future users of local channels reported expenditures for September 2020), so this test is based on the subsample of the group who reported their food expenditures for September 2020.*

We test whether the means of two expenditure indicators are significantly different from one another—expenditure shares spent on local, food-at-home market channels in September 2020, and absolute expenditures spent on local, food-at-home market channels in September 2020. Our findings show there is a statistically significant difference between these two

subsamples' expenditure share means—existing consumers with new local market channel use who intend to shop more in the future, and those who do not intend to shop more in the future. However, we fail to reject the null in terms of absolute expenditures. Based on these findings, it appears that those existing, new market channel users who also intend to shop more in the future already have higher expenditure patterns in local and regional channels. This suggests that the “future” shoppers are more likely those who are already using local channels at higher levels and will increasingly support local market channels in the future, as opposed to new shoppers who intend on increasing their participation. This was opposite of our priors that hypothesized previously active shoppers may not feel compelled to increase their expenditures further, but in fact, they do seem most poised to increase their buying in local and regional markets.

## CHAPTER 5: LATENT CLASS ANALYSIS OF CONSUMERS

Our first research question focused on understanding the meaningful factors influencing new shopping behavior during COVID-19, which was accomplished via the Heckman Probit Selection Model. Through that regression analysis, we confirmed that certain factors were significantly related to new use and future intentions related to local market channels. However, as described in the conceptual framework describing different consumers and why their behavior may have changed, there may be meaningful heterogeneity within the subset of new local shoppers, as well as within the subset of shoppers who did not use new channels at all during COVID. Such information may be timely and relevant information to those local and regional food market managers crafting new marketing, customer retention and promotional strategies moving forward. This hypothesized heterogeneity within the sample motivates our second research question— What meaningful consumer segments can we identify based on existing attitudes (values, norms, perceived consumer effectiveness) and COVID-related heterogeneity (risk, exposure, changes to income and employment) across consumers?

To answer this question, we implement a Latent Class Analysis (LCA) to identify different classes of “COVID shoppers.” Latent Class Analysis “is a statistical procedure used to identify qualitatively different subgroups within populations who often share certain outward characteristics” (Hagenaars and McCutcheon 2002). In the case of COVID-era shoppers, these individuals share outward characteristics that we have collected via our survey, like COVID-19 impacts to health, employment and income, and well as reported attitudes and beliefs. The class membership they share, based on these outward characteristics, are what “type” of shoppers they

are. We hypothesize that there are different classes of COVID-era shoppers, defined by their attitudes and the ways in which they have been impacted by COVID-19.

We include similar variables to classify respondents as we did in our regression analysis, capturing economic, social, local, and health factors that may define consumer segments. Each food value question is included on its own as a binary variable (where 1 = responses above the median response value and 0 = at or below the median response value). In analyses using Likert-scale data, where factor analysis is not appropriate, developing binary variables based on central tendency, represented by median response values, is an accepted alternative in cases where factor analysis is not deemed appropriate (Lovelace and Brickman 2013). This same logic and approach were also used in the Heckman Probit analysis described above.

The values statements used, and their median values, are described in Table 8. In addition to responses related to respondent values, we also include COVID-related variables, such as changes to income and unemployment, as well as risk and exposure to COVID-19. These are intended to capture external influences that may affect attitudes and choices related to food shopping behavior during 2020.

Table 8. Likert Scale Attitude Questions—Central Tendency (Median)

| Theme                                          | Attitude/Values Statement                                                             | FV variable name | Median Value |
|------------------------------------------------|---------------------------------------------------------------------------------------|------------------|--------------|
| <b>Local Economy</b>                           | ...that is supports the local economy                                                 | fv_localecon     | 5            |
|                                                | ...that it is locally grown                                                           | fv_locallygrown  | 5            |
|                                                | ...that it supports the food business I am buying from                                | fv_fbssupport    | 5            |
| <b>Economic Equity &amp; Social Fairness</b>   | ...that workers are treated fairly                                                    | fv_workers       | 6            |
|                                                | ...that is was produced by people I know and trust                                    | fv_trust         | 5            |
|                                                | ...that is meets my traditional and cultural preferences                              | fv_cultural      | 5            |
|                                                | ...that my purchase supports businesses owned by historically underrepresented groups | fv_underrep      | 5            |
|                                                |                                                                                       |                  |              |
| <b>Public Health &amp; Safety</b>              | ...that I feel confident in the safety protocols of the retailers where I am shopping | fv_protocols     | 6            |
|                                                | ...that I have options about purchasing method                                        | fv_options       | 5            |
| <b>Personal Food Access &amp; Availability</b> | ...that it is affordable                                                              | fv_afford        | 6            |
|                                                |                                                                                       |                  |              |

The LCA tool in Stata 17 was used for analysis, specifying 4 latent classes and using “logit” as the specification based on the fact that all variables of interest are binary. The output of the LCA tool in Stata first provides the marginal probabilities of membership in each class, which can be seen in Table 6. To assess model fit, we determine that with a Chi-squared value for the Likelihood ratio test of 7,388.9 (p-value = 1.000), we fail to reject the null hypothesis that

our model fits as well as the saturated model (in other words, our model fits as well as the saturated model). This indicates good model fit.

The next phase of analysis is to find the marginal probability of each variable being a “1” in each latent class. The *predclass* command in Stata 17 is then used to assign a latent class to each observation based on the aforementioned probabilities of being in each class. These comparative, class-dependent findings allow us to describe key differences across the four latent classes of COVID-era consumers, which were “labeled” as No Frills Shoppers, Pragmatic Shoppers, Greater Good Shoppers, and High Intensity Shoppers.

Table 9. Latent Classes Analysis with Four Classes of COVID Consumers: Marginal Probability by Class

| Variable                                                           | <b>Class 1<br/>No Frills<br/>Shoppers</b><br>46.3%<br>(n = 2,315) |               | <b>Class 2<br/>Pragmatic<br/>Shoppers</b><br>20.5%<br>(n = 1,026) |               | <b>Class 3<br/>Greater Good<br/>Shoppers</b><br>19.1%<br>(n = 954) |               | <b>Class 4<br/>High Intensity<br/>Shoppers</b><br>14.1%<br>(n = 705) |               |
|--------------------------------------------------------------------|-------------------------------------------------------------------|---------------|-------------------------------------------------------------------|---------------|--------------------------------------------------------------------|---------------|----------------------------------------------------------------------|---------------|
| Relative Size                                                      |                                                                   |               |                                                                   |               |                                                                    |               |                                                                      |               |
| Binary Food<br>Value Variable (<br>= 1 if above<br>sample median)  | Margi<br>n                                                        | Std.<br>Error | Margin                                                            | Std.<br>Error | Margin                                                             | Std.<br>Error | Margin                                                               | Std.<br>Error |
| <i>fv_localecon</i>                                                | 0.095                                                             | 0.008         | 0.475                                                             | 0.022         | 0.697                                                              | 0.020         | 0.953                                                                | 0.010         |
| <i>fv_locallygrown</i>                                             | 0.072                                                             | 0.007         | 0.248                                                             | 0.019         | 0.616                                                              | 0.023         | 0.904                                                                | 0.015         |
| <i>fv_fbsupport</i>                                                | 0.072                                                             | 0.007         | 0.524                                                             | 0.023         | 0.683                                                              | 0.021         | 0.991                                                                | 0.007         |
| <i>fv_workers</i>                                                  | 0.024                                                             | 0.004         | 0.472                                                             | 0.022         | 0.104                                                              | 0.016         | 0.764                                                                | 0.021         |
| <i>fv_trust</i>                                                    | 0.092                                                             | 0.008         | 0.523                                                             | 0.021         | 0.652                                                              | 0.022         | 0.962                                                                | 0.010         |
| <i>fv_underrep</i>                                                 | 0.045                                                             | 0.006         | 0.242                                                             | 0.019         | 0.589                                                              | 0.022         | 0.895                                                                | 0.014         |
| <i>fv_protocols</i>                                                | 0.135                                                             | 0.010         | 0.770                                                             | 0.024         | 0.086                                                              | 0.017         | 0.802                                                                | 0.021         |
| <i>fv_options</i>                                                  | 0.135                                                             | 0.009         | 0.484                                                             | 0.019         | 0.578                                                              | 0.023         | 0.897                                                                | 0.014         |
| <i>fv_afford</i>                                                   | 0.243                                                             | 0.011         | 0.689                                                             | 0.019         | 0.155                                                              | 0.019         | 0.761                                                                | 0.021         |
| <i>fv_cultural</i>                                                 | 0.101                                                             | 0.007         | 0.265                                                             | 0.017         | 0.535                                                              | 0.022         | 0.855                                                                | 0.018         |
| <i>Positive<br/>Employment/<br/>Income change<br/>during COVID</i> | 0.031                                                             | 0.004         | 0.040                                                             | 0.007         | 0.066                                                              | 0.009         | 0.094                                                                | 0.012         |
| <i>Negative<br/>Employment/<br/>Income change<br/>During COVID</i> | 0.394                                                             | 0.011         | 0.388                                                             | 0.018         | 0.549                                                              | 0.020         | 0.479                                                                | 0.021         |
| <i>COVID<br/>Exposure (Yes,<br/>or Probably<br/>Yes)</i>           | 0.147                                                             | 0.008         | 0.088                                                             | 0.012         | 0.394                                                              | 0.020         | 0.338                                                                | 0.020         |
| <i>High COVID<br/>Risk</i>                                         | 0.335                                                             | 0.011         | 0.472                                                             | 0.018         | 0.381                                                              | 0.019         | 0.485                                                                | 0.021         |

## 5.1 RESULTS

Based on marginal probabilities from the LCA, *No Frills Shoppers* have high probabilities of responding above the sample median in valuing of affordability, options for purchasing (e.g., online), and safety protocols in place at the retailers where they purchase food. Other socially beneficial or local-oriented values are fairly low for this group, indicating that the majority of individuals in this class do not feel strongly about these items. The few things that they are likely to feel strongly about are related to basic affordability, accessibility, and safety. This group was also less likely to use online shopping during 2020 than the other classes, and also less likely to have used new market channels, which can be seen in Table 10. They also have the lowest rate of intentions to use local market channels more in the future. This is a large share of the sample ( $n = 2,315$  or almost half of consumers) and likely indicates the group of shoppers whose indifference curvature and budget lines remained unchanged during COVID-19, and so they use what are considered more traditionally affordable market channels, likely persisting from earlier behavior. They also tend to be older and have lower income compared to some of the other groups, which can be seen in Table 11.

The next class of shoppers are the *Pragmatic Shoppers*. This group represents the second largest ( $n = 1,026$ ) of the four classes. A larger share of respondents in this group are likely to respond highly to valuing social and economic factors—supporting the local economy, supporting and trusting business they buy from—but overwhelmingly, they also highly value affordability and safety protocols. These consumers are likely to value these pragmatic considerations of affordability and safety if they are not in a position to afford or access the other social and local factors. We see this illustrated in their low rates of new market channel use.

However, they do have a higher rate of intending to use local market channels in the future compared to the *No Frills Shoppers*.

Table 10. COVID-era Shopping Behaviors within each Latent Class

|                                                                                            | <b>Class 1:<br/>No Frills<br/>Shoppers<br/>(n = 2,315)</b> | <b>Class 2:<br/>Pragmatic<br/>Shoppers<br/>(n = 1,026)</b> | <b>Class 3:<br/>Greater Good<br/>Shoppers<br/>(n = 954)</b> | <b>Class 4:<br/>High Intensity<br/>Shoppers<br/>(n = 705)s</b> |
|--------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------|
| <b>New Participation in<br/>Local Market Channels</b>                                      |                                                            |                                                            |                                                             |                                                                |
| <i>Direct Markets (Farmers<br/>Market, Direct-from-<br/>Producer, CSA)</i>                 | 10.24%                                                     | 6.34%                                                      | 30.92%                                                      | 29.93%                                                         |
| <i>Local Food-at-Home<br/>Channels (Direct markets,<br/>Food box,<br/>Gourmet/Artisan)</i> | 16.93%                                                     | 13.65%                                                     | 42.03%                                                      | 40.85%                                                         |
| <i>All Local Channels (Local<br/>food-at-home, Independent<br/>Restaurants)</i>            | 23.28%                                                     | 20.86%                                                     | 49.16%                                                      | 45.53%                                                         |
| <b>Intention to Shop <u>More</u> at<br/>Local Market Channels in<br/>the Future</b>        |                                                            |                                                            |                                                             |                                                                |
| <i>Direct Markets (Farmers<br/>Market, Direct-from-<br/>Producer, CSA)</i>                 | 11.14%                                                     | 13.74%                                                     | 28.09%                                                      | 33.48%                                                         |
| <i>Local Food-at-Home<br/>Channels<br/>(Direct markets, Food box,<br/>Gourmet/Artisan)</i> | 16.11%                                                     | 18.91%                                                     | 40.88%                                                      | 41.99%                                                         |
| <i>All Local Channels<br/>(Local food-at-home,<br/>Independent Restaurants)</i>            | 22.59%                                                     | 27.78%                                                     | 47.06%                                                      | 46.81%                                                         |
| <b>Use of Online Shopping<br/>Methods</b>                                                  |                                                            |                                                            |                                                             |                                                                |
| <i>September 2019</i>                                                                      | 26.09%                                                     | 23.10%                                                     | 47.27%                                                      | 40.00%                                                         |
| <i>April 2020</i>                                                                          | 34.04%                                                     | 37.91%                                                     | 60.48%                                                      | 56.88%                                                         |
| <i>September 2020</i>                                                                      | 36.29%                                                     | 42.30%                                                     | 60.69%                                                      | 61.42%                                                         |

Table 11. Demographic Characteristics by Latent Class

|                              | <b>Class 1:<br/>No Frills<br/>Shoppers<br/>(n = 2,315)</b> | <b>Class 2:<br/>Pragmatic<br/>Shoppers<br/>(n = 1,026)</b> | <b>Class 3:<br/>Great Good<br/>Shoppers<br/>(n = 954)</b> | <b>Class 4:<br/>High Intensity<br/>Shoppers<br/>(n = 705)</b> |
|------------------------------|------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------|
| Age                          |                                                            |                                                            |                                                           |                                                               |
| <i>18-24</i>                 | 14.21%                                                     | 10.82%                                                     | 15.20%                                                    | 7.09%                                                         |
| <i>25-34</i>                 | 16.93%                                                     | 14.42%                                                     | 22.75%                                                    | 17.87%                                                        |
| <i>35-44</i>                 | 14.90%                                                     | 11.60%                                                     | 21.49%                                                    | 23.83%                                                        |
| <i>45-54</i>                 | 16.20%                                                     | 15.40%                                                     | 19.50%                                                    | 23.83%                                                        |
| <i>55-64</i>                 | 16.24%                                                     | 22.51%                                                     | 11.11%                                                    | 14.89%                                                        |
| <i>65 and older</i>          | 21.51%                                                     | 25.24%                                                     | 9.96%                                                     | 12.48%                                                        |
| Income                       |                                                            |                                                            |                                                           |                                                               |
| <i>Less than \$10,000</i>    | 6.18%                                                      | 5.07%                                                      | 6.50%                                                     | 6.38%                                                         |
| <i>\$10,000 - \$19,999</i>   | 6.22%                                                      | 5.56%                                                      | 5.14%                                                     | 6.81%                                                         |
| <i>\$20,000 - \$29,999</i>   | 9.24%                                                      | 9.16%                                                      | 9.33%                                                     | 7.52%                                                         |
| <i>\$30,000 - \$39,999</i>   | 9.29%                                                      | 8.97%                                                      | 7.55%                                                     | 7.23%                                                         |
| <i>\$40,000 - \$49,999</i>   | 7.17%                                                      | 7.89%                                                      | 6.39%                                                     | 5.67%                                                         |
| <i>\$50,000 - \$59,999</i>   | 6.91%                                                      | 7.02%                                                      | 7.97%                                                     | 9.08%                                                         |
| <i>\$60,000 - \$69,999</i>   | 6.83%                                                      | 7.80%                                                      | 5.45%                                                     | 4.26%                                                         |
| <i>\$70,000 - \$79,999</i>   | 7.17%                                                      | 7.12%                                                      | 7.13%                                                     | 6.24%                                                         |
| <i>\$80,000 - \$89,999</i>   | 3.41%                                                      | 4.87%                                                      | 3.46%                                                     | 2.41%                                                         |
| <i>\$90,000 - \$99,999</i>   | 7.47%                                                      | 9.06%                                                      | 7.44%                                                     | 5.96%                                                         |
| <i>\$100,000 - \$149,999</i> | 18.79%                                                     | 19.69%                                                     | 17.71%                                                    | 19.57%                                                        |
| <i>\$150,000 or more</i>     | 11.32%                                                     | 7.80%                                                      | 15.93%                                                    | 18.87%                                                        |

The third class are the ***Greater Good Shoppers*** (n = 954). Like the ***Pragmatic Shoppers***, this group is likely to strongly value the social and locally-focused factors like supporting the local economy, supporting food businesses, as well as having culturally appropriate options, and supporting businesses owned and operated by underrepresented groups. However, this group does not tend to value affordability and safety factors as strongly as other peer groups. This group's actions also align with these attitudes, as they are very likely to have shopped at new local channels and intend to use local channels more in the future. This is a group whose behavior may reflect a shift in preferences due to COVID with a steeper indifference curve, preferring items acquired in local market channels in 2020.

The last latent class is the ***High Intensity Shoppers*** (n = 705). This is a group who values social welfare and local factors, similar to the ***Greater Good Shoppers***, but still value affordability and protocols. In short, this group is likely to consider all of these factors. This is reflected in their use of new market channels and online shopping, as well as their intended use of local market channels in the future. It is also interesting to note that this group had the highest share of respondents using new, direct local market channels during COVID-19, compared to the ***Greater Good Shoppers***. This is an interesting distinction, as the direct market channels are those most closely associated with the traditional "local food" paradigm, of which some members in this class may identify. Connecting this back to the existing literature, such findings align with research that suggests that different segments of shoppers have different reasons for participating in the same behavior of shopping locally and at direct markets (Zepeda and Nie 2012).

## CHAPTER 6: MARKET IMPLICATIONS

This nationwide survey confirmed the trend that news outlets and food systems partners with the “LRFS Response to COVID” project were reporting— a large share of U.S. consumers newly participated in a wide range of local channels during COVID-19. Our findings suggest that this new channel use cannot be contributed to a single motivating factor, but rather a range of factors including COVID-19 considerations to food attitudes related to social wellbeing and local food, which vary across different of consumers. While the conclusions related to future use of local market channels among new shoppers are inconclusive, local food systems partners should be encouraged by the finding that over 25% of the entire sample reported an intention to shop more at local, food-at-home channels in the next year.

The overarching question within local and regional food is whether new behavior will persist beyond COVID-19, when extreme personal and public health restrictions and risk are no longer a consideration at the forefront of consumers’ and retailers’ minds. In the absence of COVID-19 considerations, what can local market channels expect in terms of new customers, customer retentions, and magnitude of market channel participation? Our findings suggest that certain subsets of the sample—latent classes—who highly value factors relating to social benefit and “local” are more likely to respond shopping more at local market channels in the future. While new consumers who adopted new behavior due to COVID risk may wane, there are still a subset of consumers whose attitudes may lead them to participate more in local channels going forward.

While not all consumers shifted to new behaviors, such as the use of new local markets, over 20% of our sample did participate in these new behaviors. This subclass of shoppers does

not represent the largest share of consumers, but this new wave of behavior represented, at minimum, short-term growth for local, direct markets like farmers markets and CSAs, and has the potential to have long-term impacts as it seems some consumer preferences shifted more persistently given the significant disruption of COVID-19.

As of early September 2021—18 months after the initial onset of COVID-19 restrictions and nearly one year after our nationwide consumer survey was distributed—one report showed that 64% of polled consumers said that “grocery stores weren’t doing a good job in managing COVID-19” (Redman 2021). The same report found that the share of consumers classified as “value seekers” (using values strategies, like low prices), was down to 66% of consumers in September 2021 from 71% in September 2020. Likewise, 19% of consumers are now classified as “quality seekers,” up from 16% in September 2020. The size and general motivators of these groups mirror our survey findings—a large share of the population is still focused on value, like affordability, while a smaller share are focused quality, which may include the social benefit and “local” attitudes included in our survey. This increase in quality seekers and decrease in values seekers as of September 2021 capture potential longer-term impacts on consumer preferences related to food.

This research also provides evidence that for a portion of consumers, local and regional market channels are likely providing more for them than just the food they buy there. Two segments of consumers from our latent class analysis—Greater Good shoppers (19.08%) and High Intensity shoppers (14.1%)—responded that they strongly value local and social elements in their food purchasing decisions and are the same respondents who were likely to shop at new local channels and intend to shop locally in the future. Factors that respondents valued, like purchasing locally grown food, purchasing culturally appropriate food, and the “social norm” of

other people in their life believing local food purchasing is important, are significant motivators. Marketing in local channels could focus on these local and social values that were significant indicators of consumer class membership and use of new market channels. Strategic messaging can convey the true, holistic value of shopping at local channels, which encompasses aforementioned local, social, and community benefits that traditional retail channels may not offer.

The question still remains: what actionable strategies can local food producers and retailers implement to serve their new, and possibly persistent, customer bases? Partners on the LRFS COVID-19 project, who noted new customers shopping through local channels like farmers markets, CSAs, and directly from producers, began pivoting to meet the new demand they saw in 2020. According to an innovation brief by the Farmers Market Coalition, many markets around the country introduced additional avenues for purchasing, including curbside and drive through pick up options, as well as online ordering methods (Broadway and Spencer 2021). Additionally, many CSAs pivoted to online platforms via virtual CSA fairs, an online way for consumers to meet farmers and purchase a farm share (Spencer 2020).

While these new strategies were initially implemented in 2020 due to in-person restrictions related to COVID-19, these programs have great potential in a post-COVID world. The ability to supporting diversified purchasing methods at farmers markets can continue to benefit both producers and consumers in the long term by providing more options for buying and selling within farmers markets. We found that new local shoppers who anticipate having more time for food shopping and preparation in the future are more likely to be persistent shoppers in local channels. This speaks to the perceived time-premium in local channels, which could be a barrier for certain shoppers. The drive through, pick up, and online ordering platforms seen

during COVID-19 in 2020 for farmers markets and CSAs likely has a place in a post-COVID world, as it decreases the time-premium on local food purchasing.

In addition to time savings, technology also plays a part in making local foods more accessible and more scalable, for both consumers and producers. Virtual CSA fairs provide the ability for shoppers and farmers to interact without being limited by physical geography, making these CSA relationships available to more farms and more shoppers. A Kentucky virtual CSA fair accommodated 55 farms in 2020, compared to 6 to 18 in previous years (Spencer 2020). Additionally, the virtual nature of these events eliminates travel costs for farmers, with twice the return on investment for these virtual CSA events than previous in-person events (Spencer 2020). The same innovation brief notes that the large numbers of first-time CSA shoppers who participated in virtual CSA fairs, which speaks to the potential for scale and reach of this virtual option.

Many of the diverse motivations that different consumers had for shopping at new local channels during COVID-19—interest in local food, buying from trusted businesses, whether they have time or money to spend on food—will still exist in a post-COVID world. Local market channel operators can leverage the combination of values-based marketing in tandem with time and money saving strategies, like the technologies mentioned above, that will appeal to a core audience of values-based consumers and the wider circle of consumers that value affordability and convenience.

## CHAPTER 7: CONCLUSIONS

The research strategies and frameworks presented in this paper are valuable for several reasons. The results directly benefit local and regional food systems partners, who informed the research project from the beginning. Identifying key motivating factors for new market channel behavior, as well as identifying consumer segments, can inform partners' understanding of which consumers segments may continue using local and regional market channels in a post COVID-19 world. The results from the two complementary analyses confirm what previous local consumer research has found: while a majority of consumers are not likely to participate in new behaviors or value social wellbeing factors, there is a subset of the population that *do* make values-based food purchasing decisions.

Another layer of this analysis was the distinction between the narrower, more traditional definition of direct local food markets (farmers markets, CSAs, direct from producers) and a wider definition which includes gourmet food businesses like butchers, bakers, and small specialty stores as well as aggregated food boxes, which encompass multiple local businesses. Results were similar for both of these definitions in the Heckman Probit analysis, but there were certain classes in the latent class analysis whose used direct, local food markets at a different rate than the wider set of local markets. This distinction is relevant to food systems partners, particularly grocers and smaller retailers who do not fit into the traditional definition of "local food" but seemingly may benefit from recent events, particularly if they source, promote and connect with consumers about their role in supporting the local economy. Farmers markets and CSAs are a long-standing channel to acquire produce grown in the local area, but increasing the

range of markets and shopping options (online) where local food are available appears to be one pathway to growing local offerings to a broader set of consumers.

Beyond the immediate application of understanding COVID-era consumer behavior, this research provides a framework for analyzing consumer preferences and behaviors for future food systems shocks. The framing that allows indifference curves representing consumer preferences to shift and vary based on a diverse array of underlying factors was used here to account for impacts of the COVID disruption on preference. In particular for this research, existing food values and PCE factors, as well as new factors related to how COVID-19 affected a household, were evaluate as potential influencers on the shape and slopes of curves representing the tradeoffs between different types of food markets. In future research, changes in consumer preference and behavior amidst supply chain disruptions or public health concerns, like food shortages or food-borne illness outbreaks, could be analyzed using analogous frameworks. It could also be a conceptual model to assess consumer behavior changes in response to policy changes or education campaigns. In short, indifference curves representing consumer preferences, guided by the factors of the TPB framework, offers a versatile way to explore heterogenous consumer preferences related to values, social norms, availability and responses to horizontally differentiated products or markets.

The survey instrument used in this research contains a wealth of information that were beyond the scope of this research, including online food purchasing behavior, which could be a valuable extension of this work. For example, our survey showed that almost half of respondents shopped online in one or more market channel during September 2020, up from 33% in September 2019. There is evidence that online shopping will be a lasting behavior, with shoppers continuing to use online shopping methods in 2021 (Redman 2021). One report states an increase

and sustained level of “hybrid shoppers”—those who use some combination of online and in-person shopping methods—through the end of 2020 (Connors 2021). This trend may be of interest to food systems partners and local retailers and merits further investigation.

At the time of this writing, over a year after the collection of this survey data and over 18 months after widespread stay-at-home orders in the U.S., the COVID-19 is still present in the United States and around the globe. Many counties have reinstated mask mandates and breakthrough cases of COVID-19 among vaccinated individuals are on the rise (Markowitz 2021; Minnesota Department of Health 2021). In light of the scale and length of the COVID-19 disruption, a follow-up survey presents a valuable opportunity to understand the long-term nature of COVID-19 may affect habit formation and stability of values in a way that other disruptions do not.

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## APPENDIX

### Extended Overview of Survey Instrument

| Survey Section                      | Question                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Source                                                                                                              |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Market Channel Use and Expenditures | <p>For the following time periods (September 2020, April 2020, and September 2019), did you purchase food from any of the following places? (check all that apply)</p> <ul style="list-style-type: none"> <li>• Supercenter and wholesale (e.g., Walmart, Costco)</li> <li>• Supermarket and grocery (e.g., Safeway, City Market, Albertsons)</li> <li>• Health/natural supermarket (e.g., Whole Foods, Natural Grocers)</li> <li>• Convenience store/corner store (smaller stores with limited selection) (e.g., 7-11)</li> <li>• Discount store (e.g., Dollar Store, Aldi)</li> <li>• Smaller format grocery store (e.g., independent grocery store, food co-op, Trader Joe's)</li> <li>• Farmers market</li> <li>• Direct-from-producer (other than farmers market) (e.g., CSA, farm stand, ordering online from producer)</li> <li>• Food box (e.g. sourced from many farms/producers; picked up at food hub or delivered to home)</li> <li>• Meal/M meal Kit Delivery Service (e.g., Blue Apron, Schwanns)</li> <li>• Bakery, deli, meat, or fish market (gourmet or ethnic)</li> <li>• Large, national restaurant chains (e.g., Wendy's, Applebees)</li> <li>• Local, independent restaurant</li> </ul> | Categories adapted from USDA Food Aps and Colorado Public Attitudes Survey (USDA ERS 2020; Christenson et al. 2016) |
| Future Intentions                   | During the next year, do you expect that you/your household will purchase more, about the same, or less food from this type of retailer than you do now?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Adapted from Consumer Confidence Index and Consumer Sentiment Survey (University of Michigan 2020)                  |

| Survey Section            | Question                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Source                                                                                                                       |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Food Acquisition Channels | <p>For the following time periods (September 2020, April 2020, and September 2019), did you/your household acquire food in any of the following ways? (check all that apply)</p> <ul style="list-style-type: none"> <li>• Gardening and growing food yourself (home or community garden, backyard garden chickens, etc.)</li> <li>• Hunting, fishing, and or Foraging/Gathering</li> <li>• Food pantry/Food bank</li> <li>• Other food assistance program (Commodity Supplemental Food Program, Meals on Wheels)</li> <li>• SNAP or Food Stamps (including pandemic EBT)</li> <li>• WIC (Women, Infant, and Children program)</li> <li>• School meal program</li> </ul> | Categories adapted from: Food Aps & 2020 University of Vermont COVID Food Security Survey (USDA ERS 2020; Niles et al. 2020) |
| Categorical Expenditures  | <p>On average for <b>September 2019 (pre-COVID)</b>, what were your <b>WEEKLY</b> grocery shopping expenditures was spent in each of the following food categories?</p> <ul style="list-style-type: none"> <li>• Cereals and bakery products</li> <li>• Meat, poultry, fish, and eggs</li> <li>• Dairy and related products</li> <li>• Fruits and vegetables</li> <li>• Other food at home</li> <li>• Nonalcoholic beverages</li> </ul>                                                                                                                                                                                                                                 | BLS Consumer Expenditure Survey (exact categories and language used to benchmark against BLS 2019 data) (BLS 2020)           |
| Time Use                  | <p><b>In an average WEEK</b> in each of the following time periods (September 2020, April 2020, and September 2019), how much time did you spend:</p> <ul style="list-style-type: none"> <li>• <b>shopping for food away from home?</b> (include time spent eating out at restaurants, time spent navigating and using online ordering and delivery services, and time spent traveling to and from the retail location)</li> <li>• <b>shopping for food you plan to cook and eat at home?</b> (include in-person shopping time <b>and</b> time spent navigating and using online food shopping services)</li> </ul>                                                     | Adapted from BLS American Time Use Survey (Food and Health Module) (BLS 2020)                                                |

| Survey Section  | Question                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Source                                                                                      |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| COVID Questions | <p>Did you or anyone in your household have, or potentially have, COVID-19?</p> <ul style="list-style-type: none"> <li>• Definitely yes, I/they have been tested</li> <li>• Probably yes, but I/they have never been tested</li> <li>• Probably no, but I/they have never been tested</li> <li>• Definitely no, I/they have been tested</li> <li>• Prefer not to answer</li> </ul> <p>Are you, someone you live with, or someone you in close physical contact with, at high risk for developing complications related to COVID-19?</p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• Prefer not to answer</li> <li>• I don't know</li> </ul> | <p>ASU Health and Wellbeing During COVID-19 (Green et al. 2021)</p>                         |
| COVID Questions | <p>If you are living in an area that is/was under a stay at home order and were working, is/was your job or business considered "essential" or "non-essential"?</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>Carnegie Mellon Coronavirus Impact Survey (CMU Delphi Group 2020)</p>                    |
| COVID Questions | <p>Have you or anyone in your household experienced a change in income or job since the COVID-19 outbreak (April 2020)? Check all that apply.</p> <ul style="list-style-type: none"> <li>• Yes, lost job</li> <li>• Yes, reduced hours or income at job</li> <li>• Yes, furloughed</li> <li>• No, have not had any changes in job</li> <li>• Yes, increased hours or income at job</li> </ul>                                                                                                                                                                                                                                                                         | <p>2020 University of Vermont COVID food security survey instrument (Niles et al. 2020)</p> |

| Survey Section          | Question                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Source                                                   |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Food Security Questions | <p>These next questions are about the food eaten in your household in the last 12 months (since September of last year), and whether you were able to afford the food you need.</p> <p>The following are statements that people have made about their food situation. For these statements, please select whether the statement was often true, sometimes true, or never true for (you/your household) in the last 12 months—that is, since last September.</p> <p>"The food that (I/we) purchased didn't last, and we just didn't have money to get more." Was that often, sometimes, or never true for (you/your household) in the last 12 months?</p> <p>"(I/we) couldn't afford to eat balanced meals." Was that often, sometimes, or never true for (you/your household) in the last 12 months?</p> <p>In the last 12 months, since last (name of current month), did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?</p> <p>How often did this happen--almost every month, some months but not every month, or in only 1 or 2 months?</p> <p>In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?</p> <p>In the last 12 months, were you ever hungry but didn't eat because there wasn't enough money for food?</p> | USDA ERS Short-form Food Security Survey (USDA ERS 2012) |