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CONSUMERS' WILLINGNESS-TO-PAY FOR LOCAL SOURCING IN ALTERNATIVE RESTAURANT FORMATS

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CONSUMERS' WILLINGNESS-TO-PAY FOR LOCAL SOURCING IN ALTERNATIVE RESTAURANT FORMATS

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Agriculture, Food and Environment
at the University of Kentucky

By

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2020

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ABSTRACT OF DISSERTATION

CONSUMERS' WILLINGNESS-TO-PAY FOR LOCAL SOURCING IN ALTERNATIVE RESTAURANT FORMATS

This dissertation consists of three essays that contribute to the research on local food purchase and consumers' preferences and willingness-to-pay. Essay I examine whether there are differences in consumers' willingness-to-pay for local food across alternative restaurant formats and provides a justification for using a system to legitimate local sourcing in restaurants. Essay II studies consumers' preferences for local sourcing in restaurants in rural and urban communities and elaborates on where there is a significant willingness-to-pay for local food in rural communities. Lastly, essay III examines consumers' purchase frequency of local food across direct and intermediated markets and provides results on differences between consumers' local sourcing from these channels.

KEYWORDS: Local Food, Consumer Preferences, Willingness-to-pay, Restaurants, Latent Class Model, Choice Analysis

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November 24, 2020
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To the spirit of my mother
To my father and my husband

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1. INTRODUCTION

Local food has attracted consumers' attention during the past decades. Players in the local food value chain including consumers, producers, and policymakers, have shown interest in local food. This growing interest in locally grown products resulted in expanding market channels for local food including direct (e.g., farmers' markets, roadside stands, u-pick) and intermediate (e.g., direct to restaurants, institutions or to regional food aggregators) channels. The number of farmers' markets increased 180 percent from 2006 to 2014 (Low et al., 2015).

Several studies have investigated consumers' motivation to buy locally produced food. Factors including freshness, taste (Zepeda and Nie, 2012), supporting the local economy (Rainey et al., 2011; Bean and Sharp, 2011), safety concerns (Maples et al., 2013; Crandall et al., 2011), and environmental concerns (Zepeda and Nie, 2012) are among the incentive factors for consumers to purchase local food.

Investigating the demographic characteristics of consumers who purchase local products has been a center of attention for many studies. For example, Racine et al. 2013 found that white families are more likely to purchase local food. Residency in urban or rural communities was also a contributing factor to consumers' purchase of local food (Racine et al., 2013; McGuirt et al., 2014). In addition, gender is perceived to play a role in local food demand. A study by Mayes in 2013 found female consumers predominantly source their local food from farmers' markets.

A body of literature studies consumers' willingness-to-pay (WTP) for local food, and the effective factors on consumers' WTP. Factors such as distance, labeling products

(Burnett et al.,2011; Hu et al., 2012), local foods attributes such as certified organic, certified fair trade, and carbon footprint (Onozaka & Thilmany-McFadden, 2012) all have a positive relationship with consumers' WTP.

Evidence on the growing demand for local food along with enhancing the rural economy, the environment, food access and nutrition, informing consumer demand, and strengthening agricultural producers and markets have encouraged policymakers at the national, state, and local to expand their local food system supporting programs.

This dissertation investigated these factors and the effectiveness of these policies in three essays.

1.1. Consumers' Willingness to Pay for Local Food in Alternative Restaurant Formats

"Local" is an attribute that suffers from a lack of uniform standard and transparency, which provides opportunities for free riders to offer "illegitimate" products, or as Reiley puts it, to commit "local washing" (Reiley, 2016). Information asymmetry in the market about the "true" local food will lead to consumers' confusion and disappointment and eventually to an illegitimate market. Following the work of Asgari (2016), in the first essay we introduce the concept of local food legitimacy in restaurants and suggest a certified designation system in examining consumers' WTP for local food in a restaurant. We considered alternative restaurants including Casual dining, Fine dining, and Fast-casual restaurants. Data was collected from a stated preference response through a choice-based conjoint analysis survey conducted in the state of Kentucky on over 1200 consumers. Accordingly, respondents were provided with different pair of choice sets including distinct attributes such as cost, driving distance, as well as the level

of locally sourced ingredients and asked to choose the most preferred one. The results suggest that there is heterogeneity among consumers' preferences for local food across alternative restaurant formats. Moreover, evidence confirms that consumers are willing to pay a premium for local food not only in fine dining but also in fast-casual and casual dining formats. Our findings assist policymakers, restaurant owners, stockholders, and chefs by improving the whole market.

1.2. Differences in Willingness to Pay for Local Food in Alternative Restaurant Formats in Urban vs. Rural Communities

Literature suggests higher income is related to higher WTP for local food. The second essay investigates whether this statement holds for the relationship between urban residency and higher WTP for local sourcing. The emphasis of this chapter is on the possibility of local food promotion programs in rural areas as an economic development strategy. Exploring this possibility in rural vs. urban settings is important. We believe there are differences between these settings that could relate to potentially different value measures relating to local food. Furthermore, we used our tractor designation system by Kentucky Bluegrass, to investigate the potential opportunity of applying such a designation in rural communities. The application of the Latent Class Model (LCM) allows us to relax the assumption of consumers' homogeneity across dining formats and capturing the magnitude and shares of a group of consumers for each dining format. LCM provides us with valuable information on consumers' characteristics in each group. This chapter uses the same data as chapter two; however, we did oversample to collect more observations from the rural community. The final dataset includes 1292 observations from rural communities, and 936 observations from urban regions. In order

to measure consumers' willingness-to-pay (WTP) for alternative restaurant formats, we asked the respondents to choose the most favored options by various choice set questions of consumers' preferences for different combinations of food price, local sourcing and driving distance. The results confirm that there are consumers' preferences for local food in rural communities as well as urban regions across alternative restaurant formats. These findings are significant for state brand programs to improve their design as there is evidence of strong potential for extending their programs for both rural and urban communities. Moreover, our results could help to empower rural communities through generating investment opportunities, which lead to regional and economic development.

1.3. Local Food Purchasing Frequency by Locavores across Market Channels - Implications for Local Food System Development

'Kentucky Proud' is funded by the Kentucky Department of Agriculture (KDA) to promote foods grown and produced within the borders of Kentucky. A survey conducted by KDA in 2016 on consumers, stores, restaurants, and grocers shows 69% of the respondents are familiar with 'KY Proud' logo and 58% indicated they understand this brand. Moreover, 50% of the respondents purchase products with the 'KY Proud' logo for reasons including quality, taste, and freshness (Think New, 2016). Direct and intermediate market channels, including farmers' markets, local restaurants, and mainstream retailers, account for about $4.8 billion of local food sales in 2008 (Meas et al., 2015). Considering that Consumers' purchase of local food from direct and intermediate local markets is different, the third essay seeks to investigate consumers' frequency of purchase of local food across different groups, based on their preferences for local food and provide a comparison of local food purchase patterns across market

channels between KY and the U.S. We use data collected from customers' feedbacks through two surveys. The U.S. food consumer study was conducted in 2015 with 682 respondents, and the Kentucky food consumers survey was implemented in 2018 with 1987 respondents. We classified consumers into three groups, including 'PERIPHERY', 'MIDLEVEL', and 'CORE' based on their importance for purchasing local food. The results show to small passionate locavores groups – CORE –purchase local food from farmers market is very important, MIDLEVEL and PERIPHERY groups who include a large share of the market do not see a significant difference between local sourcing from farmers markets or intermediated markets (i.e., grocers and restaurants). Our findings provide an opportunity to target potential consumers with a higher purchase frequency of local food in the market and for farmers to grow their markets. In addition, these results suggest a basis for assessing local food promotion programs (e.g., Kentucky Proud'), which, eventually, incorporate to the success of these programs. Evaluation of the impact of the promotion programs provides a measurement to show funders and participating stakeholder how their successful investments are over time.

CHAPTER 2. CONSUMERS' WILLINGNESS TO PAY FOR LOCAL FOOD IN ALTERNATIVE RESTAURANT FORMATS

2.1. Introduction

In recent years, there has been a rapid increase in consumers' purchase of locally grown products. By 2014, the number of farmers markets in the U.S. has increased by 180 percent, which signals a growth in consumers' interest (USDA ERS, 2015). A study by USDA's National Agricultural Statistics Service in 2016 collected data about local food practices from all states in the U.S. The results show 35% of local food direct sales through farmers' markets are to consumers, 27% of the sales are to retailers including supermarkets, restaurants, and grocery stores, and 39% of farmers market direct sales is to institutions and intermediary businesses such as colleges, schools, universities, and hospitals as well as wholesalers, distributors, processors, etc. (USDA NASS, 2016). A survey by a supermarket industry association on grocery store shoppers indicated freshness (83 %), taste (56%), and improving small-scale agriculture and local farmers, as well as local rural communities, are among top reasons for local food purchase (Food Marketing Institute, 2011). Locally grown products have been distributed through various market channels including farmers markets, grocers, and restaurants. Recently, a study by the United States Department of Agriculture (USDA), the Economics Research Center (ERS) in 2019 showed the U.S. consumers expenditures on food away from home has increased from $300 billion to over $900 billion from 1997 to 2018 (Figure 2.1), which demonstrates a higher growth than the U.S consumer expenditures on food at home during the same period (USDA, ERS, 2019). While it should not be assumed that all of

the expenditure reflects consumer purchase of local food from restaurants with locally sourced ingredients, a national survey by National Restaurant Survey shows four out of ten hot trending concepts from the consumers' point of views are local relating concepts including hyper-local, locally sourced meat and seafood, locally sourced products and farm/estate branded items (National Restaurant Survey, 2018). Consumers are signaling that they value local food; therefore, it is important for restaurants to establish a way to assure consumers that they are offering a legitimate value proposition. Furthermore, encouraging local restaurants, as a major source of stable purchase in the local food value chain, to engage in local food promotion programs is a crucial success factor that could also assist the expansion of the nutritional aspects of sustainable agriculture (Starr et al., 2003).

In this regard, a "Buy Local" program (Figure 2.2) (formerly referred to as the "Restaurant Reward Program") was launched in 2017 by the Kentucky Department of Agriculture with the purpose of assisting Kentucky local restaurants and institutions to buy locally grown products (e.g. Kentucky Proud products) that their customers desire. This program rewards its participating restaurants with a 15% reimbursement of all or part of the cost of eligible Kentucky Proud purchases if the purchase was made directly from Kentucky farmers (Kentucky Department of Agriculture, 2020).

Assuring consumers about the "locally" sourced ingredients is not an easy task for restaurants. Consumers rely only on the information regarding the origin of the food provided by the restaurants. This could be an uncertain concept, which is different from one restaurant to another. Some restaurants consider products "local" as long as they are produced within the county, state, region, or even the United States, while others could

identify “local” products only if they are originated from within a very short radius from their places of sale (Woods et al., 2018). Lack of uniform standards and transparency, high demand for “local” and weakly verified credence of “local” as an attribute for products provides an opportunity for illegitimate products to undermining the legitimate local food market (i.e. “local washing”) (Reiley, 2016).

This is a similar case as the “market for lemons” argument by Akerlof (1978). In his famous theory, George Akerlof states information asymmetry about the quality of goods between buyers and sellers in the market affects the sellers’ decisions and leads to having defective goods (i.e., lemons) to be left in the market. Akerlof explains that in the absence of information transparency about the quality of goods in the market, sellers are willing to pay only a fixed price estimated based on the average value of the high-quality and low-quality goods. The fixed price is lower than the value of high-quality goods but higher than that of low-quality goods in the market, which eventually leads to leaving the lemons (i.e., low-quality goods) in the market (Akerlof, 1978). Similarly, lack of transparency about the concept of “local” and no legitimate market to provide a united standard of “local-sourcing,” consumers will be left with latecomers who are trying to “steal” the local food market using “local-washing”. Local-washing eventually leads to increased uncertainty among local food consumers and damages those restaurants who truly invest in local-sourcing to satisfy their consumers’ requirements.

This situation has been highlighted in a Pulitzer Prize-nominated article in the *Tampa Bay Times* by Reily (2016). Reily named these articles as “Farm to Fable,” and she raises awareness about the false claim that some restaurants make about “local-sourcing,” addressing it as a “fiction” that is being fed to customers to make them believe

that these restaurants cherish local sourcing and are investing in it (Reily, 2016). The *tale of local food* in restaurants makes it hard for consumers to distinguish what food is truly locally produced. False claims of some restaurants about local sourcing and advertising it to grasp consumers' attention along with the lack of a unified standard and transparency in the local food value chain, eventually arises confusion and disappointment for consumers and those restaurants who practice local sourcing. The distrust between consumers and restaurants in the market, and consumers' frustration in paying a premium for truly locally produced foods, eventually leads to lower willingness-to-pay (WTP) for local food by consumers. Based on Akerloff's "Market of Lemon" theory, in the long run, from those restaurants that do local sourcing, fewer are willing or would be able to continue to do so because of consumers' lower WTP. This situation would only remain for those restaurants in the market that either do not practice local-sourcing or they "claim" they do (i.e., lemons).This statement stresses the necessity of "local" food legitimacy even more.

Woods et al. (2018), when examining transparency and legitimacy in local food marketing from retailers to consumers, followed Suchman's (1995) definition and suggest "legitimacy" refers to the "generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed systems of norms, values, beliefs, and definitions." Also, following Zimmerman and Zeits (2002), they further define "legitimacy" as the "social judgement of acceptance, appropriateness, and desirability, enables organizations to access other resources needed to survive and grow."

Asgari (2016) presents a framework for legitimacy with four dimensions including regulatory (rules and standards certification, normative (social norms and values), cognitive (expectation of product quality, healthiness, freshness, experience, and industry (standard practices and historical customs) (Figure 2.3). He applied the concept of "legitimacy" of local food in the U.S. market using differentiated consumers as "core," "midlevel" and "periphery" based on the importance of local food in their purchase choices. Asgari's results confirm the importance of a local food certification measure, which reduces information uncertainty among consumers and provides a clear understanding of the concept of "local" by translating it to context.

An innovative example of an effort to bring transparency to local food sourcing by restaurants through a certification program was recently developed by the Lexington Visitor Center (VisitLex), creating a culinary restaurant directory for residents and visitors walking tours about Lexington dining called *Beyond Grits* (Figure 2.4). This guidance uses a creative tractor designation system based on Bluegrass Local Sourcing designation in an effort to clearly signal to consumers the extent of local sourcing by restaurants. The tractor system in this guide is marked with a blue tractor  regularly sourced ingredients from Kentucky farms, which highlights the amount of dollars invested in local farms by local restaurants and businesses. The tractor symbol ranges from zero to three located next to the name of the restaurant in the book where no tractor symbol means the restaurant does not participate in local sourcing activities, while one, two, and three tractors mean the restaurant invests up to $14,999, between $15,000 and $29,999, and over $30,000 in local farms, respectively (Figure 2.5). The tractor symbol currently is only used in the Lexington area, but Buy Local participation is statewide,

suggesting perhaps the program could be expanded based on the value of this kind of signaling to consumers, and subsequently restaurants, across Kentucky. The designation depends on a third-party measure of participation in the KDA Buy Local Program, which emphasizes the role of a certifying institution to clarify restaurants' local sourcing investment and provide a unified standard. While the tractor system does not capture all restaurant investment in local sourcing, it still provides a signal of restaurant minimum participation to consumers.

In this study, we apply the tractor designation system to understand consumers' WTP for local sourcing intensity signaled by restaurants and account for driving distance and a range of demographic factors, measuring these choice variables across alternative restaurant formats. We also seek to estimate the WTP for local sourcing statewide. We used stated preference data from a choice-based conjoint analysis survey conducted in the state of Kentucky on over 1600 consumers. Respondents were provided with different pairs of choice sets, including distinct attributes of cost, driving distance, and the level of locally sourced ingredients; respondents were asked to choose the most preferred option about the restaurant in their most preferred dining format. This study considered three different dining formats, including fast-casual, casual, and fine dining, to capture more information regarding consumers' WTP. This classification allows us to consider distinct offered services as well as consumers' heterogeneous values for each type of dining. We believe consumers' value for various restaurant formats affects their expectations from the restaurant, and eventually leads to diverse WTPs. In addition, this study considers divergent ranges of prices for each type of dining.This study especially assumes

consumers in an upscale restaurant (e.g., fine dining) are willing to pay more for their food than in casual, or fast-casual dining.

Comparing consumers' WTP for three dining types is a core contribution of this research, which has not been done in the WTP for local food literature. Therefore, the main objective of this study is to examine whether consumers' preferences for local sourcing are economically significant, are variable across different consumer segments, and are potentially different across restaurant formats (e.g., whether local sourcing is only beneficial for high-end dining formats). In other words, we examine the potential of a positive consumers' WTP for local sourcing not only in high-end (e.g., Fine) restaurant format, but also in fast-casual and casual dining. In addition, we identify a measure of WTP for local food using a universal merchandising tool that could be utilized by state departments of ag/chambers of commerce. Our results show consumers are sensitive to the restaurant attributes. In other words, consumers are willing to pay more for higher local sourcing in the restaurant, but they are willing to pay less for longer driving distance. Moreover, we found consumers are willing to pay for local food not only in fancy, high-end restaurants but also in fast-casual and casual dining types.

2.2. Background and Previous Literature

The term "local" has various definitions in the literature. Some scholars define "local" food as products grown within a county while others define it as food grown within a state (Wilkins et al., 1996; Zepeda & Leviten-Reid, 2004). Some consumers describe "local" in terms smaller than their state (Zepeda & Li, 2006), meaning they believe "local" refers to foods produced within a county or neighboring county, or within a state. Moreover, consumers' definition of "local" largely depends on their perceptions

of local food attributes such as quality, freshness, healthiness, natural, etc. (Darby et al., 2008). From the perspective of some large food retailers like Whole Foods or Wal-Mart , "local" refers to the products that are grown in the same state in which they are sold (Whole Foods Market, 2013), or those grown within a 100-mile radius (CooPNews, 2016). In this paper we define "local" as those food grown within the state (i.e., state of Kentucky, in our case), following the designation utilized by the KY Department of Agriculture in the context of their Buy Local program, which is linked to the 'tractor' merchandising program. Consumers who purchase local food are called "Locavores" (Stanton et al., 2012). Locavores demonstrated various reasons for their local choice including, freshness, taste, and quality (Mugera et al., 2017)

Locavores have grown in popularity as a target market in mainstream food magazines, food advertisements and media. This trend made retailers and food producers acknowledge local food promotion by advertising locally grown products in their stores or attracting locavores by offering farm fresh dinners on their special menus in restaurants (Rutgers University, 2010). Stanton et al. (2012) stated store promotions for local foods are associated with consumers' demand for locally grown products. In addition, restaurants' investment in local sourcing signals consumers about restaurants good public relations, supporting local producers, better quality, fresher and safer food, superior taste, supporting the local economy, and ability to purchase small quantities, which enhances consumers' satisfaction (Roy et al., 2016). Consumers' satisfaction increases the perceived utility, which in many cases is associated with higher WTP for trustworthy food (Liang, 2016). Therefore, WTP could serve as a proxy for measuring

consumers' behavioral intentions, which has been vastly used in the previous literature (Shin et al., 2017).

The increasing trend in the number of locavores is also associated with local food promotion programs, which has developed consumers' awareness about local food. United States Department of Agriculture (USDA) has offered and funded different promotion programs to promote locally grown products. The first promotion program started in the 1930s with promotion programs for Washington apple, Florida citrus, or California peaches. Other states have participated in local food promotion programs since then (Patterson, 2006). O'Hara and Coleman (2017) assessed the impact of Farmers Market Promotion Program (FMPP) and Local Food Promotion Program grants and found these programs have improved the local food markets significantly between 2013 and 2014. In another study, McFadden et al. (2016) studied the impact of Farm-to-School programming in Colorado State by using input-output (IO) and Social Accounting Matrix (SAM) models and found it has a positive effect on the state economy. A CCE of Mid-Atlantic consumers by Onken et al. (2011) studied consumers' WTP for locally produced strawberries promoted in the state marketing program. They found that a state marketing program is more successful in New Jersey as consumers are WTP for locally labeled strawberry. The mentioned studies along with others (Carpio & Isengildina-massa, 2008; Hu et al., 2012; Starr et al., 2003) show that there are consumers' preferences for locally grown products (e.g., WTP).

Another study in Indiana found 60% of consumers have strong preferences for local food (Jekanowski et al., 2000). As a result, consumer WTP is higher for foods that are labeled local, organic, or non-genetically modified foods (GMO-free) (Loureiro & Hine,

2002). However, the magnitude and amount of the consumers' preferences might vary across states with diverse local promotion program approaches. For example, a study by McKay et al. (2019) examines restaurants WTP for Tennessee Certified Beef (TCB). The authors conducted a telephone survey and estimated the data using probit regression to determine factors affecting restaurants decision to purchase TCB. They found the location of the restaurant in proximity to urban centers is the most important factor in restaurant local sourcing as it is directly associated with the number of consumers the restaurant could attract. These studies highlight the significance of understanding consumers' WTP for local food. Specifically, WTP analysis is important for USDA in order to improve the support programs for local and regional food businesses. Also, WTP information helps USDA to evaluate the effectiveness of the promotion programs.

The identification of the extent of WTP for a credence attribute such as "locally sourced" helps market channel participants develop more effective merchandising strategies and programs. Utilizing the results of these studies to assess food labeling effectiveness on restaurants' menus allows researchers to estimate the success of the local food promotion programs such as "Kentucky Proud." For example, Hu et al. (2012) used stated preference data from Kentucky and Ohio, USA, to estimate consumers' WTP for various credence attributes, including state branding labels, for blackberry jam. They found that in those states, consumers' WTP is higher for indicated locally produced products. The authors also showed that consumers pay higher premiums to support small family farms.

Willingness-to-pay is a measurement that has been extensively used for estimating consumers' preferences. Gracia et al. (2011) estimated consumers WTP for a

local lamb meat label in Spain. The authors conducted an experiment using shoppers from different districts in 2009. Implementing non-hypothetical experimental auctions, their findings show there is a positive WTP for locally grown meat in the Aragon region. Also, Lusk (2018) in a study for the Food Marketing Institute, conducted a national survey on over 2,000 U.S. chicken consumers to understand the effect of labels and brands on consumers' belief and willingness-to-pay for slow growth chicken. He found consumers' WTP is sensitive to information being provided to them through food labels and brands. Specifically, consumers stated that they most value organic, non-GMO, and no added hormone labels. Another stream of literature on state branding programs is a sub-literature of labeling studies. State branding programs aim to promote in-state agricultural sustainability and regional economics as well as consumers' awareness (Osburn et al., 2020). However, the effect of state branding programs on consumers' WTP is mixed. Osburn et al. (2020), in their study, evaluated consumers' preferences for state-labeled products. Their findings show consumers do not necessarily have higher WTP for their own state products. Yet, the results suggest consumers have a higher preference for some regional-labeled products like milk.

Willingness-to-pay estimation provides an evaluation of consumers' value and perception of local food. Retailers commonly use locally grown labeling to signal consumers about local foods. A conjoint choice experiment by Onozaka and McFadden (2011) showed U.S. consumers highly value local food labeling. Furthermore, Campbell et al. (2010) studied the effect of "Local" and "Organic" labeling on Canadian consumers' purchase of locally grown products. They implemented surveys to capture consumers' preferences for different attributes of local and organic foods. They found

that labeling food as local or organic has a large effect on consumers' likelihood of purchase and WTP. Also, they showed socio-demographic variables including gender, region and income are significantly associated with consumers' WTP for local and organic labeling on foods. As demonstrated in Campbell et al.'s study, type of residency (i.e. region/origin) of dinners could affect their choice and WTP for local food. In other words, residents are found to be more interested in the origin and the producer of their food in restaurants. Residents value food producers' information provided on the restaurants' menu and are willing to pay a higher premium for locally sourced ingredients in restaurants. However, travelers mostly appreciate a visual menu and do not seem to be concerned about the origin/producer of the food on the menu (Lu & Chi, 2018). Thus, consumers' preferences change based on geographical and personal characteristics as well as the quality of products and marketing channels (Carpio & Isengildina-Massa, 2009).

Previous research show consumers' preferences for locally sourced products are increasing. In a study conducted by the United States Department of Agriculture, Economic Research Service in 2015 shows an increasing trend in the number of farms with direct-to-consumer or intermediate sales (i.e., local food sold through marketing channels like grocery stores, restaurants, or other food institutions) increased by 17 percent (USDA-ERS, 2015). Although studies show consumers preferences toward locally grown products has increased significantly, local sourcing could be expensive for restaurants. Branding and labeling foods as local usually increase the final price of the product for consumers and contribute to higher menu price premiums (Batte et al., 2010). Bruno and Campbell (2016) conducted an online survey and found that students are

willing to pay a premium for offering a locally produced food option in on-campus dining halls. They argue that the possibility of offering local food options might not be economically feasible. That is, the premium that students will pay does not cover the cost of such an option. Therefore, it is crucial to estimate consumers' WTP and the premium for offering locally sourced foods, as well as understanding the cost coverage of this option.

Consumers' preferences can be measured using different techniques; one commonly utilized approach is the Conjoint Choice Experiment (CCE). CCE is a method to estimate a consumer's WTP using different choice sets presenting distinct product's attributes. CCE was mainly applied by previous literature to estimate WTP. Means et al. (2015) implemented CCE to examine consumers' preferences and WTP for organic vs. locally produced blackberry jam in the states of Ohio and Kentucky. They considered three levels of local production, including cross-state region (the Ohio Valley), state boundary (state-proud logos), as well as sub-state regions. Their findings confirm consumers' WTP for local food is positive. Also, locavores in their sample pay higher premiums for local foods grown in regions smaller than the border of a state. Another study by Akaichi et al. (2016) also used CCE to estimate WTP for local food. They found consumers are willing to pay a higher premium for locally grown and locally labeled products. Ellison et al. (2014) used field experiment data to capture the effectiveness of calorie labels at reducing calories ordered by restaurants' customers. Their results show that customers' demand for high-calorie food did not change simply because restaurants chose lower-calorie menus. Furthermore, they found that using a symbolic calorie label on restaurants menus can reduce the calorie intake by most of the "most health

conscious" and the "less health conscious" (Ellison et al., 2014). This study highlights the importance of effective labeling on the restaurant menu.

Despite promising results achieved using CCE, this method does not account for heterogeneity across the sample. In other words, different market segments have various preferences for different attributes, which could not be readily obtained through CCE. The estimation of different market segment preferences is more direct using a latent class model (LCM). LCM is a method to capture consumers' heterogeneity. For example, Chan-Halbrendt et al. (2010) applied latent class analysis to explore people's preferences for using degradable shopping bags instead of the currently used plastic bag. Based on their results, most people preferred degradable and non-plastic shopping bags at a reasonable price. Furthermore, they found various preferences for different kind of materials across ages.

Kikulwe et al., (2011) also used LCM to estimate consumers' willingness-to-pay for genetically modified (GM) banana variety in Uganda. They considered different attributes including bunch size, technology, producer benefit, and price, to evaluate consumers' valuation for GM banana. Their sample included 421 banana-consuming households coming from three different regions in Uganda, which were selected randomly. Considering the heterogeneity in consumers' preferences and acceptance of GM bananas, the authors implemented LCM to describe the consumers who are willing to accept the GM banana. Their results confirm the heterogeneity hypothesis relating to consumers' preferences. Furthermore, LCM showed GM bananas are most acceptable among poor, rural households of the Eastern region. On the other hand, households located in urban areas are less willing to accept GM bananas due to the significant

welfare losses. Likewise, Chan-Halbrendt et al. (2010) estimated consumers' preferences for olive oil in Albania using CCE to design the survey and estimating LCM. Their results showed that there is a gap between consumers' preferences and what is being offered in the olive oil industry. Albanian consumers stated that they are willing to pay more for the domestic product; however, there is a greater demand for imported products due to the perceived higher quality of imported olive oil.

Imami et al. (2016) used the same approach to estimate Albanian consumer preferences for cheese attributes, including price, origin, milk type, and the use of powder milk to produce cheese. Their results showed that the dominant attribute in terms of consumers' preferences is the type of milk used for cheese making where all consumers prefer cheese made without powder milk. In another study by Imami et al. (2011), CCE and LCM were used to estimate consumers' preferences for lamb meat, attributes including origin, price, weight, and safety/certification. Similarly, consumers preferred domestic lamb meat and smaller weight lamb over larger weight lamb. The authors estimated four classes of consumers using LCM. The first class (i.e., sub-group) of consumers strongly preferred only one type of local lamb (lamb meat from domestic highlands). The second class of consumers stated preference for both types of local lamb meat (lamb meat from domestic highlands and plain/lowland). The third class has the lowest preferences for imported meat. Finally, the fourth class of respondents preferred lamb meat from domestic highlands followed by plain/lowland lamb.

Another study by Ortega et al., (2011) implemented LCM to estimate heterogeneity in consumers' preferences for food safety attributes in pork. The authors found food safety system legitimacy such as a government certification program, third-party

certification, a traceability system, and a product-specific information label is highly preferred by Chinese consumers with a high WTP. LCM was used by Scarpa et al. (2009) to estimate preference heterogeneity among consumers' WTP for locally produced wine. Their findings show WTP values and socio-demographic variables for four distinct subgroups (classes) of consumers in the sample. The authors concluded a high average WTP for CDO Prosecco wine purchased from restaurants and wine shops. They also found relative to the reference age group (70yrs and 40yrs old), younger people stated higher WTP for all type of Prosecco wine.

Latent class model provides insights on whether local sourcing and charging a group of potential consumers for that is economically feasible. Chakrabarti et al. (2019) used LCM to understand Connecticut consumers' WTP for mushrooms marketed with various labels including organic, non-GMP, GMP, and locally produced). The authors found that only one-third of consumers are willing to pay for local products. Therefore, charging all the consumers with a premium would probably decrease the profit. Despite previous efforts in this field, only a few studies have been undertaken to understand consumers' WTP for locally grown foods in restaurants. Further research is required to answer the question of "How much extra are consumers willing to pay for locally grown labeled foods on restaurants' menus?" especially across different restaurant formats. No studies have reviewed restaurant patron WTP using LCM to suggest distinct WTPs for each class (subgroup) of consumers. This study adds to the previous literature by being the first to estimate consumers' WTP for local sourcing across various dining formats including fast-casual, casual, and fine. Furthermore, this research contributes to previous studies on WTP for local foods by estimating unique WTP and market share for each subgroup of

consumers based on their preferences for local sourcing as well as their sociodemographic characteristics.

2.3. Theoretical Framework and Econometric Modelling

The theoretical foundation of our analysis is based on the random utility theory and the assumption of economic rationality and utility maximization (Hall et al., 2004). Random utility theory, developed by McFadden in 1974, suggests that different attributes of a product form a statistical model of human choice behavior. Moreover, the Lancastrian microeconomic approach is the other theory that the conjoint experiment is based on. Lancaster (1966) developed this approach and suggested that while utility in the traditional view is derived from a good, the consumer's utility does not just come from the good itself but also comes from the characteristics that the good possesses (Lancaster, 1966). In the context of local food, locally grown products are the goods of interest and can be viewed as a collection of attributes. We identify 'local' as a credence attribute that signals consumers who value the 'local' product in this study. Some of these attributes include freshness, taste, healthiness, and quality. Based on Lancaster (1966), consumers consider their preferences and choose a bundle of goods' characteristics that maximizes their utilities subject to their budget constraints. Random utility theory links the Lancastrian approach to a quantifiable econometric analysis.

There exist various econometric methods to estimate consumers' preferences. We introduce some of them in the following sections and present our regression and WTP results based on the most popular econometrics models including logit, mixed logit, asclogit, conditional logit, and latent class models. Each model has its own advantages and disadvantages and should be chosen based on the research question and assumptions.

Some of these models are explained in the next section. However, the main reason we are presenting our results estimated by these models is to examine the robustness of our WTP estimation obtained from latent class model. We also seek to evaluate the consistency of WTP estimations across different econometric models with unique assumptions.

2.3.1. Conditional Logit (CL) Model

Conditional Logit (CL) model developed by McFadden (1974) is well suited for models in which a choice among alternatives is treated as a function of the characteristics of the alternatives, rather than (or in addition to) the characteristics of the individual making the choice (Hoffman & Duncan,1988).

Accordingly, in order to understand whether preferences for local sourcing are different across restaurant formats, and to identify a WTP measurement for local food, we estimated the utility of consuming locally grown products using a CL model. This model is an appropriate fit since our data include multiple observations for each case (individual or decision), where each observation represents an alternative that may be chosen. In this model, the explanatory variables are the characteristics of the alternatives. An individual's utility function using CL model can be shown as follow:

$$U_{ij} = z'_{ij}\,\beta + \varepsilon_{ij} \qquad (2.1)$$

Where, z'_{ij} represents the characteristics of the j^{th} alternative for individual i, and β is the corresponding parameter. CL model evaluates the probability (p_{ij}) of choosing profile (choice) j by individual i as follow:

$$P_{ij} = \left(\frac{\exp(z_{ij}\,\eta)}{\sum_{j=1}^{J}(z_{ij}\,\eta)}\right) \qquad (2.2)$$

2.3.2. Alternative Specific Conditional (ASC) Logit Model

ASCLogit (Mcfadden, 1974) is a specific case of conditional logit model, where multiple observations are required for each individual, or as defined in this model, each case. Each observation represents individual's choice of alternatives. Therefore, in this model, two types of independent variables are specified: alternative- specific variables (in our study alternatives are A, B, and Neither), and case-specific variables (e.g. gender, age, income, education, and residency). The former variables vary across cases and alternatives, whereas case-specific variables vary only across cases. An individual's utility function using ASCLogit model can be shown as follow:

$$U_{ij} = X_{ij}\beta + (z_i A)' + \varepsilon_{ij} \quad (2.3)$$

Where, β is a $p \times 1$ vector of alternative-specific regression coefficients (p represents each of product attributes including cost, driving distance, and local sourcing in our research) and,

$A = (\alpha_1, \ldots, \alpha_J)$ is a $q \times J$ matrix of individual-specific regression coefficients (q represents each of the socio-demographic variables in our research).

In this model the elements of the $J \times 1$ vector ε_i are independent Type I (Gumbel-type) extreme-value random variables with mean γ (the Euler–Mascheroni constant, approximately 0.577) and variance $\pi^2/6$. We fixed one of the α_j to the constant vector to normalize the location. The vector u_i quantifies the utility that the individual gains from the J alternatives. The alternative chosen by individual i is the one that maximizes utility.

ASCLogit model evaluates the probability (p_{ij}) of choosing profile (choice) j by individual i as follow:

$$P_{ij} = \left(\frac{\exp(\eta X_{ij})}{\sum_{j=1}^{J} (\eta X_{ij})} \right) \quad (2.4)$$

Where η=1 assuming X_{ij} to be a linear function of independent variables.

2.3.3. Multinomial Logit (MNL) Model

In this study, we asked respondents about their preferences for different restaurant attributes including local sourcing, price, and driving distance. These attributes are presented in highly distinguishable choices (A, B and neither), which are not ranked. In this sense, Multinomial Logit (MNL) model could be used for the analysis of consumers' primary choices (Greene, 1998; Ben-Akiva & Lerman, 1985). In the context of this study, the MNL model determines the likelihood of a consumer selecting one of the different attributes of the restaurant (price, driving distance and local sourcing), given his/her socio-demographic characteristics and preferences for local food. MNL model is defined as follow:

$$\log \left(\frac{p_{ij}}{p_{i1}} \right) = X_i \beta_j \quad (2.5)$$

for j = 1, …, J and i = 1, …, N

where, X_i is the matrix of socio-demographic characteristics of the individual i, and β_j is the parameter vector for each alternative, and can be estimated using the Newton method (Greene, 1995). p_{ij} is Prob (Y = j|x), which is estimated as bellow by method of maximum likelihood:

$$p_{ij} = \left(\frac{\exp(x_i \beta_j)}{\sum_{j=1}^{J} \exp(x_i \beta_j)} \right) \quad (2.6)$$

Therefore, the probability of selecting different attributes is obtained as follow:

$$p_i\,(Y=1) = \left(\frac{1}{1+\sum_{j=1}^{J}\exp(x_i\beta_j)}\right) \tag{2.7}$$

$$p_i\,(Y=j) = \left(\frac{\exp(x_i\beta_j)}{1+\sum_{j=1}^{J}\exp(x_i\beta_j)}\right) \tag{2.8}$$

where j = 1,2,….J-1, and i = 1,2,….,N

MNL models estimate the odds of each category relative to a baseline category as a function of covariates. Therefore, this method relaxes the assumption of confounder effects when testing for the equality of coefficients (Fujimoto, 2005).

2.3.4. Mixed Logit (ML) Model

ML is a model for choice data that allows random coefficients, which means ML accounts for the violation of the Independence of the Irrelevant Alternatives (IIA) by human preferences for various alternatives. ML relaxes the normal distribution assumption of data. The model provides the choice probabilities of the coefficients (McFadden & Train, 2000). ML assumes that the decision maker faces a choice among J alternatives (in our study alternatives are A, B, and Neither). The utility of individual i from alternative j can be derived using the following equation:

$$U_{ij} = \beta'_i\, X_{ij} + \varepsilon_{ij}\,, \tag{2.9}$$

Where, X_{ij} are observed variables based on the alternative and the individual, β_i is a vector of coefficients of these variables for individual i showing that individual's preference, and ε_{ij} is a random term. Therefore, the choice probability conditional on β_i is defined as below:

$$P_{ij}(\beta_i) = \left(\frac{\exp(\beta_i' X_{ij})}{\sum_{j=1}^{J}(\beta_i' X_{ij})}\right) \quad (2.10)$$

Since in this equation, X_{ij} is observable and β_i and ε_{ij} are non-observable to the researcher, the unconditional choice probability is the integral of the above function and is defined as the mixed logit probabilities.

2.3.5. Latent Class Model (LCM)

Based on the objective of this study, both the traditional logit model and a latent class model (LCM) could be used to estimate an individual's likelihood of choice. However, we believe people's background in our sample is not homogenous; therefore, a latent class approach is more appropriate dealing with heterogeneity.

Latent class model has the advantage of estimating different utility functions for a different group of consumers in the market with various preferences. Furthermore, unlike the traditional conjoint choice model (i.e., one class), the problem of independence of irrelevant alternatives (IIA) is resolved in LCM (Vermunt & Magidson, 2000). LCM considers two sources for heterogeneity in individuals' choice behavior: the first one refers to the observable attributes of choice, and the second one comes from the unobservable factors (Hensher & Greene, 2003; Milon & Scrogin, 2006). In LCM, respondents choose different conjoint choices based on various, observable, and unobservable perceived value of different product attributes and individuals' characteristics (McFadden 1974). Yet, respondents are assigned to distinct classes (groups) based on their perceived value of the product attributes (i.e., their response to conjoint choice experiment questions). CL model could be presented as bellow for LCM:

$$P_{ij} = \left(\frac{\exp(\eta\beta\, Z_{ij})}{\sum_{j=1}^{J}(\eta\beta\, Z_{ij})}\right) \quad (2.11)$$

As noticed, $\beta\ and\ Z_{ij}$ are new terms in LCM, which make it different from the CL model. B is a vector of estimated parameter coefficients, and Z_{ij} denotes explanatory variables of X_{ij} including a profile-specific constant, product attribute of profile j, and socio-demographic factors of respondent i.

As mentioned above, one of the unique characteristics of LCM is that this model places respondents into N distinct classes (groups). LCM relaxes the assumption of homogeneity among respondents and assigns individuals to M classes based on their choice of observable attributes of the products as well as the unobservable heterogeneity among the respondents. Therefore, based on Hensher and Greene (2003), β obtains the unobservable heterogeneity among individuals; therefore, it is different from class to class. The choice probability of individual I belong to class n (n = 1, …..,N) is shown as below:

$$P_{ij|n} = \left(\frac{\exp(\eta_n\beta_n\, Z_{ij})}{\sum_{j=1}^{J}(\eta_n\beta_n\, Z_{ij})}\right) \quad (2.12)$$

In this equation, η_n and $\beta_n$represent the class-specific parameter and the class-specific estimated utility parameter, respectively.

There are different methods to determine the optimal number of classes in LCM. In this study we used the Bayesian Information Criterion (BIC), which shows the three-class model is the optimal model for LCM analysis (lowest BIC value obtains best results) (Schwartz 1978).

2.3.6. Estimation of Willingness-to-pay (WTP)

This study builds on the empirical model using the choice experiment structure that employs three attributes for alternative restaurants. We estimate the probability of choosing the choice set *l* utilizing the conditional logit model in STATA 14 package. Different coefficients of β were obtained and were used to measure a willingness-to-pay (WTP) for the different product's attributes. WTP in this study is given by:

$$W_{PTPrice} = - \beta_p/\beta_{Price} \quad (2.13)$$

Where,

$W_{PTPrice}$ = willingness-to-pay for the pth attribute

β_p = estimated parameter of the pth attribute

β_P= estimated price coefficient

We adopted a parametric bootstrapping technique to create 95% confidence intervals for the WTP, which was originally developed by Krinsky and Robb (1986).

2.3.7. Experimental Design

CCE by Louviere and Woodworth (1983) is used in this study to conduct surveys. The CCE rests on the idea that the attributes of a good as well as the level of those attributes could define that good. As a result, considering consumers' different preferences, changing each of the product's attributes might affect consumers' purchase decision and behavior. Hence, CCE is a valuable method to understand consumers' preferences and critical attributes that determine people's WTP for that good.

In our study, we considered three types of alternative restaurants as fast casual, casual dining, and fine dining. To clarify these concepts, we defined a fast-casual restaurant as more upscale than fast food, which offers disposable dishes and flatware. Similarly, a casual dining restaurant serves moderately priced food in a casual atmosphere. Likewise, fine dining is defined as an upscale restaurant that offers diners an elegant atmosphere with high-quality service (Types of Restaurant, n.d). In our survey, we presented the respondents with a detailed definition of each type of restaurant. For example, casual dining is defined and presented to the respondents as below:

A Casual Dining Restaurant is a restaurant that serves moderately priced food in a casual atmosphere. Except for buffet-style restaurants, casual dining restaurants typically provide table service. Casual dining restaurants often have a full bar with separate bar staff, a larger beer menu and a limited wine menu. They are frequently, but not necessarily, part of a wider chain, particularly in the US.

We do not provide any specific example in the definition of the restaurant, because we do not want to bias participants' responses. Following the definition of the restaurant, we asked respondents to assume a typical meal for two people in that type of dining and choose their favored bill option based on that. For instance, the assumption of the payable bill for the casual format of dining is provided as follow:

Assume that this is a typical meal for two, which would include: Two soft drinks, two meals (pasta, sandwich, or gourmet salad), and two desserts.

In the next stage, we defined product attributes and their levels by exploiting related literature. Studies such as Torjusen et al. (2001) as well as Padel and Foster (2005) have

demonstrated that price, local ingredients, and driving distance are among the factors that explain consumers' purchase behavior. Therefore, in this study, these attributes are chosen to measure their significance on people's WTP for local food. Table 2.1 represents the selected attributes and their levels.

Building on the choice sets offered in the survey, CCE measures consumers' WTP for the local restaurants that purchase more locally grown ingredients and offer them on their menu. In this method, consumers are asked to assess two hypothetical profiles of the product that represent a different level of each attribute and choose their most preferable profile or neither one (Chan-Halbrendt et al., 2009).

We utilized a fractional factorial design to design the attributes' profiles and select a sample of attribute levels from total possible profiles (5x4x4x4x3x4) ((attributes) x (fast casual dining prices) x (casual dining prices) x (fine dining prices) x (driving distance levels) x (local sourcing)). In this study, we constructed different sets of randomly developed and separated pairs of profiles. Each set consists of nine pairs of profiles. Based on the respondents' monthly spending on restaurants, they were asked to choose one type of restaurant, where, based on various percentiles, they eat most. Regardless of the type of chosen restaurant, respondents were asked to answer a set of nine questions (e.g. 18 profiles/choice cards of different levels of attributes).

We randomized the choice sets and conducted the survey to administer the appropriate number (around 400 observations) of the respondents for each type of restaurant. The experiment design directly asked respondents to pick the most preferred profile. Table 2.2 shows an example of the choice sets presented to respondents in the casual dining restaurant.

As mentioned above, only three attributes (price, driving distance, and local sourcing) were chosen to ask of the respondents. The reason being that in this study, we only care about attributes regarding local sourcing in alternative formats. The tractor indicator used in the choice cards is a symbol to represent the degree to which a restaurant sources from local farmers. Figure 2.5 represents the tractor symbol used to demonstrate the level of local sourcing by the restaurant based on the Bluegrass Local Sourcing Designation.

We constructed three different versions of the survey (fast-casual dining, casual dining, and fine dining) to administer an appropriate number of respondents for alternative restaurant formats. In each restaurant format, along with socio-demographic questions, respondents were provided with nine questions asking them to choose among choice card (A), (B), or neither. The experiment design directly asks the respondents to pick the most preferred profile. Table 2.2 shows an example of the choice sets presented to respondents to choose from.

2.3.8. Limitation of Conjoint Choice Experiments

While CCE provides valuable information on consumers' preferences and choices, this method may suffer some limitations, which the most important one is observed or hypothetical bias. In this regard, results obtained from CCE are considered to lack validity and credibility. Penn and Hu published a study in 2020 using data from 21 studies with willingness-to-accept (WTA) implications. Results of conducting a meta-analysis show, comparing to WTP studies, elicitation of WTA methods provides no evidence of significant HB error (Penn & Hu, 2020). Observed bias refers to the situation where responses are affected by social desirability, different meaning of choices

for each respondent, and how they assess each profile and over/under estimation of what respondents would actually pay, or choose in the real world (Donaldson et al., 1997).

However, there are methods that could be done to minimize these limitations. In this study we establish a budgetary context to evaluate respondents' value, not merely WTP. In other words, we required respondents to answer questions about income and the number of household members to determine a basic budget for a household. We, then, ask them follow-up questions such as "*How important are local food options when making purchasing decisions (both for preparing at home as well as consuming food away from home)*?" or "*How many times did you purchase at least one local product at a farmers market within the last 12 months*?" as well as "*What is approximately, your monthly spending at Restaurants?*" to obtain information on the relative value of local food for each household.

We also try to assign respondents to their appropriate choice environment based on their previous restaurant experience by asking questions like "*In a typical month, how much do you spend at restaurants (includes fast food, casual, and fine-dining restaurants)?"* and "*per month visits to casual dining restaurants*?". Based on the respondents' answer to this question, we asked them to self-assign themselves into different dining formats (i.e. Fast-casual, casual, fine). This improvement allows the respondent to answer the choice questions about the product's attributes that they are familiar with. The respondents' familiarity with the distinct attributes of each dining format decreases the chance of over/underestimation, which leads to lower HB.

Furthermore, to present realistic prices and choice options, we introduce 'bill for two' instead of the food price on the menu. We believe people would relate to 'bill for

two' better than asking 'what would you pay for a steak?'. The problem with HB is not only that it causes over estimation or false prices, but the bigger issue is that HB does not obtain an accurate measure of what the respondents' choice look like. We tried to overcome this problem by offering various prices for each dining formats. In other words, price ranges increase as we move from a fast-casual dining to a fine dining format. This modification helps with adopting the product to more realistic prices and choices and decreases the HB.

Another source of HB is an insufficient number of observations. In order to minimize the problem, through oversampling, we collected data from rural respondents who visit fine dining more often. We initiated the second round of data collection to provide reliable results based on more observations, which could adjust the effect of the rural respondents' unfamiliarity with a fine dining format.

2.3.9. Data Collection

The survey was conducted through Qualtrics platform in the state of Kentucky in December 2018 and early January 2019, employing 1600 respondents. We cleaned the data by omitting those respondents who chose "I do not consent" to the terms of the study, and those who answered the survey under 129 seconds. We believe these respondents probably did not read the survey completely, and their responses are not reliable. We also eliminate those responses in which the respondent did not complete the survey as well as spurious responses. Finally, we dropped those responses with more than two expenditure categories apart from the self-reported question of 'spending on restaurants,' a consistency filter we included for our core question early and late in the survey.

2.3.10. Survey Instrument

The survey questionnaire included four sections where in the first one, respondents were asked to determine their "monthly level of spending at restaurants" from categories including '$0-$49', '$50-$99', '$100-$199', '$200-$299', '$300-$399', and 'More than $400'. We also asked the respondents to answer, "the number of monthly visits each to fine, fast-casual and casual dining" from the following categories: 'None or less than 1', '1-2', '3-4', '5-6', '7-8', '9-10', and 'More than 10'. Respondents were assigned to a choice experiment offered in the context of a restaurant format consistent with their stated patronage of the various restaurant types. Respondents were requested to self-select themselves to the fast-casual dining if based on their responses to the previous question, their number of visits to fast casual dining made up more than 60% of their total restaurant visit, casual dining if their number of visits to casual dining made up more than 30% of their total restaurant visit, and fine dining if their number of visits to fine dining made up more than 10% of their total restaurant visit. The flow logic of the survey is presented in Figure 2.6. Regardless of the type of restaurant, respondents were provided with a block of nine randomized choice sets. Other sections of the survey questionnaire were socio-demographic as well as economic background questions and questions regarding respondents' interest in local food.

2.3.11. Survey Technique

The survey was designed using Qualtrics survey software. We employed Survey Sampling International (SSI) to execute and distribute the survey. The only criteria suggested for the sample were that respondents be Kentucky residents and at least 18

years old. There was a total of 1600 usable observations after cleaning the collected data from those respondents who made the same choice for all questions (e.g. straight liners) as well as those who spent less than 4 minutes to complete the survey (e.g., speeders).

2.3.11.1. Socio-demographics of Survey Respondents

Table 2.3 reports the descriptive statistics in alternative restaurant formats. In the survey, between 72% and 75% of respondents were female and (average) 86% of the sample were white in all types of dining. The mean of the age variable is between 43 and 50 years old in different types of restaurants, whereas the average mean of the state of Kentucky is 39 years old. The education distribution shows that 30% of the fast-casual dining customers have a high school degree or less while 28% and 29% of casual and fine dining customers have a bachelor's degree, respectively. The average household income in the sample for fast-casual restaurants is $47,751, which is lower than the average household income for casual and fine dining customers ($61,126 and $75,811, respectively). State average household income is $46,659, which is less than the average household income of restaurant customers in the sample.

Interest in local food was measured by asking respondents about the frequency of purchasing local food within the last 12 months from different market channels. We also asked the respondents to indicate "How important is local food to your consumer choice?". Although we do not present this variable in Table 2.3, we employed the responses to validate the purchase frequency questions. Between 41% and 57% of respondents stated to have moderate to strong interest in local food purchase from different market channels (farmers' market, grocers, and restaurants). Further investigation of interest in local food variables showed fast-casual dining customers

purchased local food, on average, 6-10 times from grocery stores, 1-5 times from farmers' market and 1-5 times from restaurants in the last month. On the other hand, casual dining and fine dining customers stated a higher average number of purchases from farmers' markets and grocers. Fine diners seem to have the highest average number of restaurantsvisits among other types of restaurant customers.

2.3.12. Model Specification

LCM was used to capture the potential heterogeneity in respondents' preferences for distinct choices (product profiles) based on restaurants attributes, including cost (C), driving distance (D), and local-sourcing (L); and individuals' socio-demographic characteristics, including age (A), gender (GE), household income (HI), education (ED) and residency (RE). Therefore, the preference model to estimate the probability for individual i in class n choosing choice j is specified as below:

$$P(j) = f(C, D, LS, NB, A, GE, HI, ED, RE) \quad (2.14)$$

Where,

P(i) is the probability of choosing choice A, B, or Neither

C is the cost of meal for two in the restaurant (in fast-casual dining format the cost options are $14.99, $18.99 , $22.99 and $26.99; in casual dining format the cost options are $34.99, $38.99, $42.99 and $46.99; in fine dining format the cost options are $49.99, $53.99, $57.99 and $60.99)

D is the time it takes for the respondent to arrive to the restaurant, taking values of 10 minutes, 20 minutes, and 30 minutes.

LS is local-sourcing amount by restaurant, taking options of no local-sourcing, some local-sourcing, moderate local-sourcing and significant local sourcing

NB is a No-buy option (opt-out option), a dummy variable taking values of 0 and 1

A, GE, HI, ED, and RE represent age, gender, annual household income group in $1000 (15, 32, 50, 70, 90, 110, 130, 150 and 170), educational attainment years (6, 10,12,14,16 and 18), and residency communities(Rural or Urban).

Latent class model assumes both observed preferences for product attributes and unobservable variables as well as consumers' characteristics affect individuals' behavior and their decisions. LCM categorized the population of respondents into a set number of classes or groups. Each of these classes shares the same parameters, but they are different in preferences. There are different measures to determine the number of classes. In this study, we used Bayesian Information Criteria (BIC) to decide about the number of consumer groups. Tables (2.4 – 2.6) represent BIC estimations for three types of dining. The number of classes which is associated with the lowest BIC is the optimal number of groups for LCM. Therefore, four, three, and two are the optimal number of classes for fast-casual, casual, and fining dining, respectively.

2.4. Results

The accuracy of latent class results is significantly dependent on the correct selection of the number of classes (Abarda et al., 2018). However, there is no generally approved statistical measurement for determining the number of segments (Nylund et al., 2007). Yet, the most used criteria are the minimum Akaike Information Criterion (AIC), the modified Bayesian Information Criterion (BIC), and Log likelihood (LL). These three commonly used criteria were evaluated in this study to decide on the number of segments

following Ben-Akvia and Swait (1986), Swait (1994), Andrew and Currim (2003), and Hu et al. (2004). Tables (2.4 -2.6) compare goodness-of-fit measurements evaluations having two to four segments across dining formats including fast-casual, casual, and fine dining. BIC value shows the 'best' number of segments for latent class analysis when BIC is at its minimum. The decreasing value of BIC is at its lowest (11808.44) for four segments, for fast-casual dining. BIC value for casual dining decreases from two to three segments, but starts to increase from three to four segments, which indicates three segments are the 'best' number of segments for casual dining. Finally, for fine dining, as the number of segments increase, BIC value also rises; therefore, two segments are the 'best' number of segments.

We used STATA 14 package to estimate the model parameters. The alternative-specific conditional logit model was used to estimate the attributes' coefficients. Table 2.3 shows variables types and descriptions.

Table (2.7-2.12) represent the results of different model estimations for three dining formats as well as WTP evaluations for each consumer segment. The dependent variable is the likelihood of choosing (e.g. option (A), (B), or neither), and the independent variables are provided choice profiles) (nine sets of choices A, B, and Neither) along with socio-demographic variables.

We compare results estimating asclogit, conditional logit, logit, mixed logit and latent class models. The purpose of this comparison is to provide a justification for using LCM as a better fit. Moreover, by comparing WTP values obtained from various models, we provide a robustness test of WTP values estimated by LCM, where these values are approximately consistent with what was produced from other models. The first estimated

model is asclogit or Alternative Specific Model, which is a specific case of the more general conditional logit model. Conditional logit results are also presented in the appendix. The main difference these two models is that clogit is used when a data are group; however, each observation in a group may be a different individual, but all individuals in a group share a common characteristic. On the other hand, asclogit model is used when data is grouped and all observations in each group refer to one individual. Coefficients estimations for our data shows the same results for clogit and asclogit models, which is an indication of the explicit interaction of the case-specific variables (i.e. gender, income, education, age, residency) with the alternatives (i.e. A, B, Neither). Clogit and asclogit both assume that the Independence from Irrelevant Alternatives (IIA) assumption holds. IIA implies that the odds-ratio between two alternatives does not change by the inclusion (or exclusion) of any other alternative (McFadden, 1978). Mixed logit does not assume that IIA holds in the data. Yet, WTP estimations show consistent values for 'No Local Sourcing', 'One Level of Local Sourcing', 'Two Levels of Local Sourcing', and 'Three Levels of Local Sourcing' across logit, mixed logit, and conditional logit models.

Comparing the significant variables across these models show all the main attributes obtained expected coefficient signs with local sourcing being positive and price and driving distance attributes being negative. Furthermore, restaurants attributes were significantly different (at the 1% level) from the baseline across all data sets and estimated models. The overall model is significant at the 1% level. The "opt-out" option is represented by the "No-Buy" variable in the results. Tables 2.7, 2.9, and 2.11 show the

No-Buy variable is significant and negative for all consumer classes, indicating that the member of the group prefers purchasing local food.

The interpretations of coefficients are complicated since we used the conditional logit model. However, we could suggest that local sourcing has a positive relationship with the likelihood of choosing to pay in a local restaurant. In addition, we could also add that the magnitude of local sourcing coefficient is higher in casual dining format, which means customers going to this format of dining express higher importance for the source of food in casual dining. Yet, price and driving distance coefficients are negative, implying member of the segment prefers local food with lower prices and in shorter driving distance.

Because the first level of each attribute is the highest level, the negative signs of price and driving distance's coefficients imply that a 1% increase in the level of these two attributes brings respondents less utility. These variables were provided to the respondents at different levels. The negative effects on respondents' utility increases as we move toward fast-casual dining from fine dining. For local sourcing, the positive coefficient of 0.33, 0.40, and 0.36 for fast-casual, casual and fine dining, respectively, means that as the level of local ingredients or food on a restaurant's menu increases, respondents are more likely to dine at the restaurant because of a perceived increase in utility level.

The second part of the results represents WTP estimation for a one unit increase in the amount of local sourcing (e.g., additional amount of local sourcing from $14,999 to $15,000 and from $29,999 to $30,000 and over), and WTP for driving an additional mile to eat at a restaurant. WTP for the attributes, calculated based on parameter estimates

from Tables 2.11 and 2.12, show that fine dining customers have the highest WTP for an additional level of local sourcing in the restaurants, with $4.54 USD and the lowest WTP for an additional mile of driving distance with $ -0.50 USD. The second highest WTP for locally sourced food in restaurants are casual dining customers who are willing to pay $3.96 USD. However, they will pay $0.42 USD less for an additional mile of driving distance. Interestingly, fast-casual dining customers are also willing to pay $3 USD for an additional tractor of local sourcing. Like the other two types of dining, fast-casual restaurants customers pay $0.41 USD less to drive a mile more to the restaurant. Table 2.13 shows WTP summarizes WTP comparison using various models.

2.5. Conclusions and Implications

The results of this study can provide beneficial information on local food preferences to policymakers, farmers and marketers involved in local food promotion and distribution. As seen in the result section, age, income, and education are effective of individuals' choice of restaurant local sourcing. Furthermore, estimated coefficients of restaurant attributes show there is a significant interest in local sourcing within each restaurant format, which shed light on the previous common belief that only consumers of fancy, high-class restaurants are interested in local sourcing. Therefore, there are opportunities for promotion programs such as buy local to invest in promoting local food in different types of dining. One novelty of this study is the implication of LC and conjoint choice analysis in three different types of restaurants: fast casual, casual, and fine dining. This experimental design captures valuable information on individuals' preferences; however, one caveat of such a model is the potential risk of hypothetical bias. In this regard, alternative methods

could be used, such as market data, and experiments including laboratory experiments, field experiments, and auctions. Yet, we believe our method in this study is appropriate since local-sourcing level in restaurants is still hypothetical and has not been established.

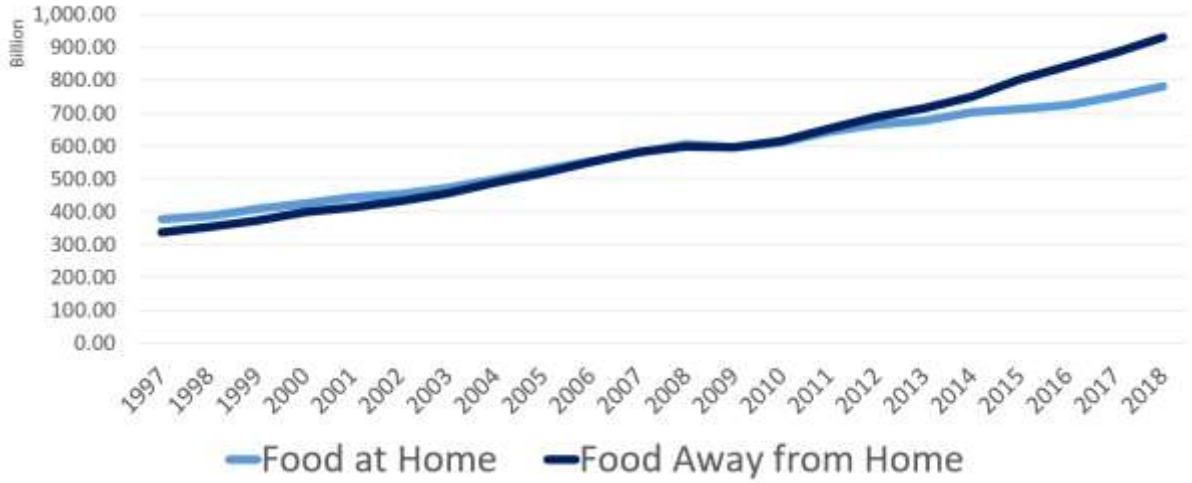
Furthermore, the implication of the tractor sample to represent the level of local sourcing to the respondents and consumers' interest in restaurants' local sourcing highlights a need for a third-party certification to legitimize restaurants' local sourcing in a standard way. These results are especially important to USDA in order to understand the effectiveness of local food promotion programs, which seek to reward local sourcing in restaurants. Also, our findings are significant to chefs and small food businesses in the industry who seek opportunities to generate higher profit margins through satisfying restaurants patrons as well as the retailers and government agencies that could benefit from these results to understand consumers' preferences for local food distinct attributes.

Another organization who could benefit from these results is the Chamber of Commerce. There are many opportunities that the Chamber of Commerce could help local restaurant with. The Chamber of Commerce could help its member restaurant to promote local sourcing by catering, sponsorship, hosting and taste events that introduce local food to diners. Also, discounts on valuable services such as insurance and credit card processing, as well as coupons, member to member discounts and flash deals are among other opportunities that the Chamber of Commerce could offer restaurants to increase the number of restaurant patrons and promote local sourcing. To implement these strategies properly, it is necessary for the Chamber of Commerce

to understand the specific values that consumers are willing to pay for restaurants local sourcing.

One limitation of our stated preferences data is hypothetical bias, which commonly occurs in WTP studies, where they ask consumers about stating their WTP for a good. In our study we implemented some strategies to minimize this bias. In order to collect more realistic responses, we asked consumers to self-select themselves into the dining format they visit the most. This strategy helps the respondents to answer questions for the dining format they believe they best fit in. However, we still observe there is some evidence of overstating WTP for local food for fine dining formats, which requires other experiments to examine. Therefore, designing a field experiment where consumers are provided real money to choose their most favorite option and measuring the potential hypothetical bias could be one direction for future research.

Figure 2.1. U.S. Consumer Food Expenditures

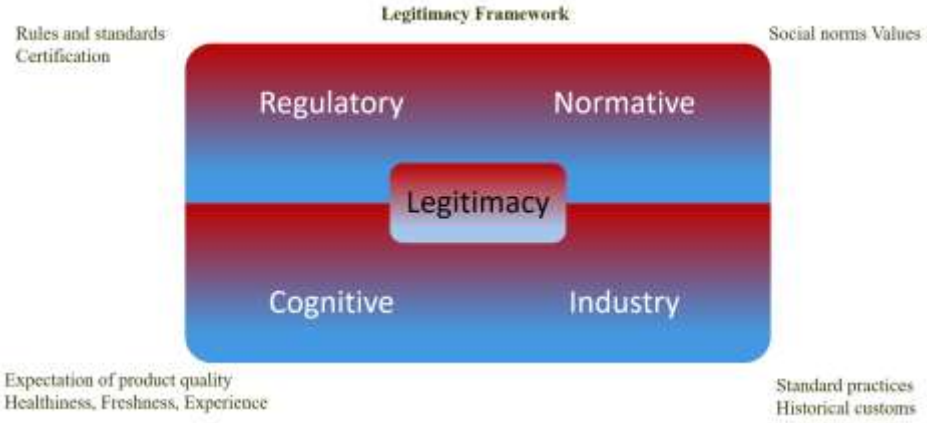


Source: USDA, ERS, 2019

Figure 2.2. Buy Local Logo

Source: VisitLex.com

Figure 2.3. Local Food Legitimacy Framework

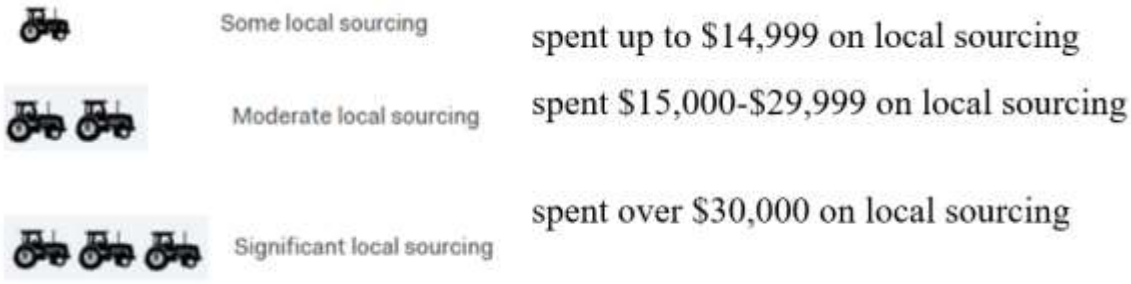


Source: Asgari, 2017

Figure 2.4. Beyond Grits-VisitLex walking tours about Lexington dining

Source: VisitLex.com

Figure 2.5. Tractor Designation



Source: Bluegrass Local Sourcing

Figure 2.6. Logic of Survey Flow

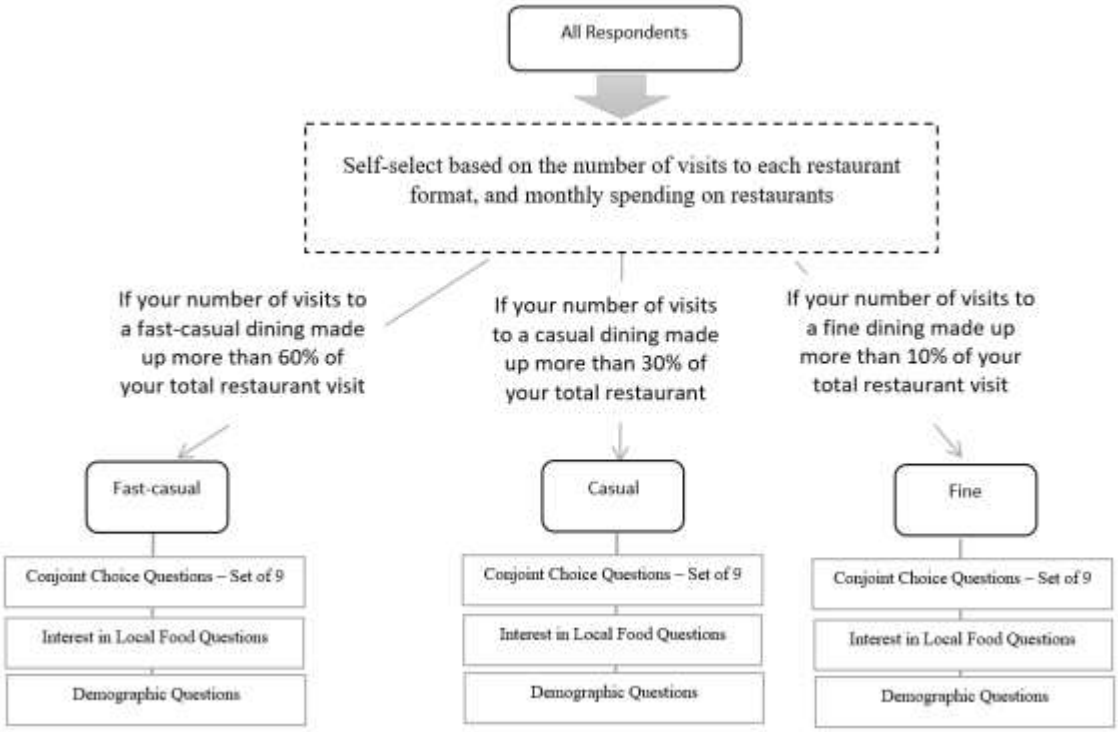


Table 2.1. Attributes and Their Levels

Attributes		Levels			
Price	Fast-Casual Dining	$14.99	$18.99	$22.99	$26.99
	Casual Dining	$34.99	$38.99	$42.99	$46.99
	Fine Dining	$49.99	$53.99	$57.99	$60.99
Driving Distance		10 min	20 min	30 min	
Investment Level in Locally Sourcing		No local sourcing	some local sourcing	moderate local sourcing	significant local sourcing

Table 2.2. Example of a Choice Set in Casual Dining Restaurant

Attributes	Profile 1	Profile 2
Price	$42.99	$38.99
Driving Distance	20 min	10 min
Locally Sourced Ingredients	Moderate Local Sourcing	Not Local

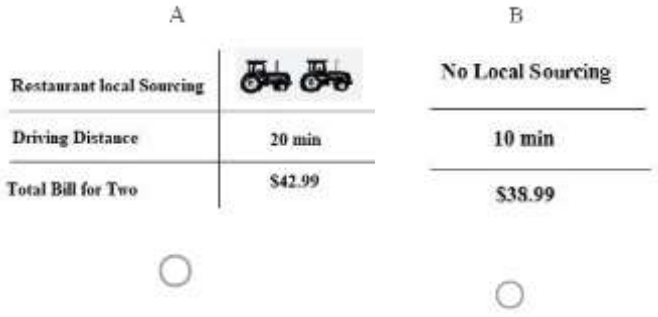


Table 2.3. Demographic characteristics of representative sample

Variable	Description	Sample Mean/Freq. Fast-Casual Dining	Sample Mean/Freq. Casual Dining	Sample Mean/Freq. Fine Dining
Number of respondents		864	364	399
Female (%)	= 0 if a respondent is female, and 1 otherwise	74.65	71.98	72.27
White (%)	=1 if a respondent is white, and 1 otherwise	89.12	86.54	84.96
Age	A continuous variable representing respondent's age	43.25 YRS	50.20 YRS	44.50 YRS
Education	A continuous variable representing respondent's education in years	13.61	14.36	14.63
Household income	A continuous variable representing respondent's annual income before tax	$47,751	$61,126	$75,811
Urban (%)	Categorical Variable	46.88	49.18	55.46
Suburban (%)	Categorical Variable	11.57	17.03	17.70
Rural (%)	Categorical Variable	41.55	33.79	26.84
Monthly spending at restaurants ($)	Categorical Variable	$103.50	$137.09	$196.02
Fast-Casual dining monthly visit (purchase/past 12 months)	Categorical Variable	3.67	2.32	3.74
Casual dining monthly visit (purchase/past 12 months)	Categorical Variable	1.95	3.03	3.63
Fine dining monthly visit (purchase/past 12 months)	Categorical Variable	0.86	1.03	2.15
Interest in Local food variables (%)	=1 if at least some interest, and 0 otherwise	40.86	43.41	56.34

Table 2.4. Fast-casual dining format statistics for determining optimal number of consumer classes

Number of classes	Number of observations[1]	Number of parameters (K)	Log likelihood at coverage (LL)	AIC[2]	BIC[3]
2	864	14	-5993.447	12014.89	12127.7
3	864	24	-5814.059	11676.12	11869.5
4	864	34	-5733.243	11534.49	11808.44

Table 2.5. Casual dining format statistics for determining optimal number of consumer classes

Number of classes	Number of observations[4]	Number of parameters (K)	Log likelihood at coverage (LL)	AIC	BIC
2	364	14	-2581.955	5191.91	5292.612
3	364	24	-2469.301	4976.601	5149.233
4	364	34	-2423.504	4915.008	5159.57

Table 2.6. Fine dining format statistics for determining optimal number of consumer classes

Number of classes	Number of observations[5]	Number of parameters (K)	Log likelihood at coverage (LL)	AIC	BIC
2	339	0	-2262.313	4524.626	4524.626
3	339	24	-2177.626	4403.252	4574.177
4	339	34	-2110.664	4289.327	4531.47

[1] Sample size is 23,327 choices from 864 individuals (N)
[2] AIC (Akaike Information Criterion) is calculated using [-2(LL-K)]
[3] BIC (Bozdogan Akaike Information Criterion) is calculated using [-LL+(K/2) x ln(N)]
[4] Sample size is 9,828 choices from 364 individuals (N)
[5] Sample size is 9,153 choices from 339 individuals (N)

Table 2.7. Fast-Casual Dining Format Coefficients Estimations with Different Models

Variable	asclogit			Conditional logit	logit	mixed logit	Latent model			
	Choice A[6]	Choice B	Choice 'Neither'				Class 1	Class 2	Class 3	Class 4[7]
Local Sourcing	.32*** (.016)	.32*** (.016)	.32*** (.016)	.18** (.082)	.29*** (.067)	.06 (.160)	.67*** (.241)	-.34** (.158)	.26*** (.043)	.49*** (.023)
Driving Distance	-.04*** (.002)	-.04*** (.002)	-.04*** (.002)	-.04*** (.001)	-.05*** (.002)	-.06*** (.003)	.01 (.020)	-.07*** (.021)	-.05*** (.005)	-.04*** (.002)
Price	-.11*** (.003)	-.11*** (.003)	-.11*** (.003)	-.11*** (.003)	-.16*** (.004)	-.16*** (.006)	-.52*** (.104)	-.09*** (.035)	-.15*** (.010)	-.08*** (.005)
No-Buy	4.05*** (.238)	4.05*** (.238)	4.05*** (.238)	3.10*** (.091)	4.50*** (.109)	5.89*** (.191)	-12.08*** (1.708)	-.37 (.833)	-3.51*** (.267)	-4.85*** (.187)
Gender	-	.04 (.067)	.05 (.072)	-.03 (.027)	-.02 (.022)	-.07 (.052)	.41 (.292)	.19 (.269)	.10 (.226)	-
Age	-	.003* (.002)	.03*** (.002)	-.009*** (.0007)	-.006*** (.0006)	-.002* (.001)	.002 (.009)	.04*** (.007)	.02*** (.006)	-
Education	-	-.02 (.014)	-.07*** (.016)	.03*** (.005)	.02*** (.004)	.03** (.011)	-.09 (.067)	-.14** (.060)	-.04 (.049)	-
Income	-	.0004 (.00008)	-.01*** (.001)	.003*** (.0003)	.001*** (.0002)	.001** (.0007)	-.005 (.004)	-.01*** (.004)	-.009*** (.003)	-
Residency	-	.04 (.060)	-.03 (.063)	.01 (.024)	.007 (.019)	.0002 (.049)	-.56** (.271)	-.26 (.235)	-.13 (.198)	-
Pseudo R2				0.14	0.10					
Class Share (%)	-	-	-	-	-	-	11	12	23	52

*** significant at 1% , ** significant at 5% , * significant at 10%

[6] Based Alternative

[7] Based Variable

Table 2.8. Fast-Casual Dining Format WTP Estimations with Different Models

WTP	logit	mixed logit	Conditional logit	asclogit	Latent model
Local sourcing (LS[8]) ($/Tractor)	No LS: 1.81 1 level of LS: 2.48 2 levels of LS: 3.15 3 levels of LS: 3.83	No LS: 0.41 1 level of LS: 2.68 2 levels of LS: 4.96 3 levels of LS: 7.23	No LS: 1.61 1 level of LS: 3.13 2 levels of LS: 4.65 3 levels of LS: 6.18	2.91	Class1: 1.30 Class 2: -3.67 (Smallest share 12%) Class 3: 1.72 Class 4: 6.11 (Largest share 52%)
Driving Distance ($/additional mile)	-0.32	-0.36	-0.36	-0.40	Class1: 0.02 Class 2: -0.78 Class 3: -0.37 Class 4: -0.60

[8] Local Sourcing (LS) is measured based on the restaurant level of investment of local sourcing (For more information see pg.15)

Table 2.9. Casual Dining Format Coefficients Estimations with Different Models

Variable	asclogit			Conditional logit	logit	mixed logit	Latent model		
	Choice A[9]	Choice B	Choice 'Neither'				Class 1	Class 2	Class 3[10]
Local Sourcing	.38*** (.025)	.38*** (.025)	.38*** (.025)	.20* (.119)	.32*** (.099)	.20 (.235)	.33*** (.061)	.49*** (.031)	.02 (.291)
Driving Distance	-.04*** (.003)	-.04*** (.003)	-.04*** (.003)	-.04*** (.003)	-.05*** (.003)	-.05*** (.004)	-.04*** (.007)	-.04*** (.003)	-.05 (.039)
Price	-.11*** (.005)	-.11*** (.005)	-.11*** (.005)	-.11*** (.005)	-.16*** (.006)	-.15*** (.008)	-.19*** (.017)	-.10*** (.006)	-.28*** (.112)
No-Buy	6.38*** (.391)	6.38*** (.391)	6.38*** (.391)	5.39*** (.245)	7.70*** (.294)	8.55*** (.375)	7.78*** (.697)	7.03*** (.336)	8.41** (4.13)
Gender	-	.15 (.103)	.10 (.110)	-.02 (.041)	-.01 (.033)	-.33 (.081)	-.59 (.478)	-.32 (.423)	-
Age	-	.002 (.002)	.02*** (.002)	-.008*** (.001)	-.005*** (.0008)	-.004 (.002)	-.02* (.013)	-.04*** (.012)	-
Education	-	-.05*** (.020)	-.09*** (.021)	-.02*** (.008)	-.01*** (.006)	.02 (.016)	.18** (.092)	.14* (.081)	-
Income	-	-.0006 (.001)	-.01*** (.001)	.004*** (.0005)	.002*** (.0004)	.004 (.001)	.02*** (.008)	.02*** (.007)	-
Residency	-	.15 (.097)	.13 (.101)	-.07* (.038)	-.05 (.031)	-.15 (.079)	-.44 (.436)	-.08 (.399)	-
Pseudo R2				0.16	0.11				
Class Share (%)	-	-	-	-	-	-	25	63	10

*** significant at 1% , ** significant at 5% , * significant at 10%

[9] Based Alternative

[10] Based Variable

Table 2.10. Casual Dining Format WTP Estimations with Different Models

WTP	logit	mixed logit	Conditional logit	asclogit	Latent model
Local sourcing (LS) ($/Tractor)	No LS: 2.02 1 level of LS: 2.85 2 levels of LS: 3.69 3 levels of LS: 4.53	No LS: 1.36 1 level of LS: 3.23 2 levels of LS: 5.10 3 levels of LS: 6.97	No LS: 1.79 1 level of LS: 3.54 2 levels of LS: 5.30 3 levels of LS: 7.06	2.91	Class1: 1.70 Class 2: 4.85 (Largest share 63%) Class 3: 0.069(Smallest share 10%)
Driving Distance ($/additional mile)	-0.34	-0.39	-0.38	-0.41	Class1: -0.23 Class 2: -0.47 Class 3: -0.20

Table 2.11. Fine Dining Format Coefficients Estimations with Different Models

Variable	asclogit			Conditional logit	logit	mixed logit	Latent model	
	Choice A[11]	Choice B	Choice 'Neither'				Class 1	Class 2[12]
Local Sourcing	.38*** (.025)	.38*** (.025)	.38*** (.025)	-.19 (.125)	.09 (.102)	-.16 (.249)	.50*** (.027)	.003 (.139)
Driving Distance	-.04*** (.003)	-.04*** (.003)	-.04*** (.003)	-.03*** (.003)	-.04*** (.003)	-.05*** (.005)	-.04*** (.003)	-.001 (.018)
Price	-.08*** (.006)	-.08*** (.006)	-.08*** (.006)	-.08*** (.006)	-.11*** (.007)	-.10*** (.007)	-.08*** (.006)	-.12*** (.029)
No-Buy	6.13*** (.466)	6.13*** (.466)	6.13*** (.466)	5.40*** (.339)	7.78*** (.412)	9.007*** (.517)	6.97*** (.379)	4.44*** (1.57)
Gender	-	.22** (.102)	.11 (.122)	-.12*** (.043)	-.07** (.034)	-.25*** (.084)	-.29 (.377)	-
Age	-	-.001 (.003)	.01*** (.003)	-.003** (.001)	-.001* (.001)	.004 (.002)	-.02** (.010)	-
Education	-	.02 (.022)	-.05** (.023)	.03*** (.009)	.02*** (.007)	.02 (.017)	.03 (.068)	-
Income	-	.00009 (.001)	-.01*** (.001)	.004*** (.0004)	.002*** (.0003)	.003*** (.0009)	.02*** (.006)	-
Residency	-	.02 (.097)	.04 (.107)	-.03 (.040)	-.02 (.031)	-.02 (.080)	.13 (.336)	-
Pseudo R2				0.15	0.10			
Class Share (%)	-	-	-	-	-	-	81	18

*** significant at 1% , ** significant at 5% , * significant at 10%

[11] Based Alternative

[12] Based Variable

Table 2.12. Fine Dining Format WTP Estimations with Different Models

WTP	logit	mixed logit	Conditional logit	asclogit	Latent model
Local sourcing (LS) ($/Tractor)	No LS: 1.98 1 level of LS: 10.21 2 levels of LS: 18.44 3 levels of LS: 26.68	No LS: -1.60 1 level of LS: 1.73 2 levels of LS: 5.06 3 levels of LS: 8.40	No LS: -2.31 1 level of LS: 5.22 2 levels of LS: 12.75 3 levels of LS: 20.29	4.61	Class1: 5.90 (Largest share 81%) Class 2: 0.03 (Smallest share 18%)
Driving Distance ($/additional mile)	-0.41	-0.51	-0.45	-0.52	Class1: -0.49 Class 2: -0.01

Table 2.13. WTP Results Comparison with Different Models

Fast casual	Logit WTP: $2.51/tractor, $-0.33/mile to restaurant cLogit WTP: $3.19/tractor, $-0.37/mile to restaurant Latent class Class 1 (23.5%) older, lower education and income; WTP $1.71/tractor Class 2 (12.7%) older, lower education and income compared to class 2 or 3; WTP -$3.69/tractor Class 3 (63.8%) reference class; WTP $4.04/tractor
Casual	Logit WTP: $2.89/tractor, $-0.34/mile to restaurant cLogit WTP: $3.62/tractor, $-0.39/mile to restaurant Latent class Class 1 (25.4%) younger, higher education and income; WTP $1.69/tractor Class 2 (63.7%) younger, higher education and income compared to class 1 or 3; WTP $4.86/tractor Class 3 (11.0%) reference class; WTP $0.13/tractor
Fine	Logit WTP: $4.27/tractor, $-0.41/mile to restaurant cLogit WTP: $5.33/tractor, $-0.46/mile to restaurant Latent class Class 1 (51.7%) younger, higher education and income; WTP $3.02/tractor Class 2 (32.1%) higher education and income compared to class 1 or 3; WTP $25.37/tractor Class 3 (16.1%) reference class; WTP -$0.97/tractor

CHAPTER 3. DIFFERENCES IN WILLINGNESS TO PAY FOR LOCAL FOOD IN ALTERNATIVE RESTAURANT FORMATS IN URBAN VS. RURAL COMMUNITIES

3.1. Introduction

In this study, we seek to examine the potential differences in rural and urban consumers' preferences for local sourcing across different restaurant formats. In particular, we propose to answer the following research questions: is there a willingness-to-pay (WTP) differential between urban and rural patrons for local sourcing in fast casual, casual, and fine dining formats? If the difference is positive and significant, how much is this difference? Is rural consumers' WTP high enough to make a local food promotion program such as "Buy Local" in Kentucky worthwhile in rural restaurants?

The business environment, in the current economic situation, is challenging for restaurants. New food alternatives are being offered, which have changed consumers' dining habits and eating preferences and increased competition in the industry as well (Sloan, 2010). Consumers' preferences are defined as a set of preferences that are dependent on product attributes, which eventually form individuals' certain personal preferences (Zikmund & Babin, 2010). The emergence of quality assurance and value-added labels such as "local," "organic," or "fair trade" allows consumers to choose their most preferred options according to their values and needs (Inwoods et al., 2009). Locally produced foods have grown in popularity and have found their way to restaurant menus. National Restaurant Survey (NRS), annually, ask American Culinary Federation chefs to rate the popularity of restaurants trending concepts. Their result showed local-related concepts are among the top ten trending concepts from chefs' perspective (NRS, 2015,

2018). Restaurants use “local food” to differentiate their brand from other competitors (Alfnes & Sharma, 2010). “Local food” has different definitions, which depending on the circumstances, rely on both the origin of the product as well as the place they are marketed. However, the 2008 Farm Act defines “locally grown products” as those that are marketed less than 400 miles from its origin. While the Food Safety Modernization Act, enacted in January 2011, defines local as food purchased within 275 miles or the same State where it was produced (Matson et al., 2013). In this study, we define local food as those foods grown within the state of Kentucky.

Consumers prefer local food because of their perceived benefits including quality and freshness (Brown, 2003; Tey et al., 2017), taste and appearance (Tregear & Ness, 2005), supporting family farms (Pirog, 2003), sustainability (Zepeda & Leviten-Reid, 2004). However, local food production is generally more labor-intensive. Also, seasonality reasons and market constraints add to the cost of local food offerings in the market (Ortiz, 2010). Yet, locally produced foods have unique attributes and characteristics that affect restaurant patrons’ decision for food, which bring them to pay a higher premium for these products (Aprile, 2016). The higher price of locally grown foods for consumers is associated with limited quantity and higher quality of these products (Jung et al., 2015). Several studies have suggested nutritional indications, as well as food safety labels on restaurant’s menu, can increase consumers’ intention to purchase and WTPs (Liu et al. 2012; Thorndike et al. 2012; Feldman et al. 2015; Lu & Gursoy, 2017). Therefore, there is a positive relationship between consumers’ responses to local food and farm name and pictures included on the restaurant’s menus (Campbell & DiPietro, 2014; Alfnes & Sharma, 2010). Studies investigated consumers’ preferences

for local food and showed consumers are willing-to-pay a premium for locally sourced products (Pirog & Larson, 2007; Darby et al., 2008; Carpio & Isengildina-Massa, 2009). Understanding consumers' preferences for local food and estimating their WTP can be used by restaurants to define their marketing strategies. Also, the growing popularity in local food and increasing trend of out of the home food consumption (Casini et al., 2015) emphasizes the importance of understanding consumers' values for locally sourced ingredients.

Consumers' decision to buy local food is affected by various determinants. Researchers investigated the driving factors affecting consumer interest in local food (Arsil et al., 2014; Zepeda & Deal, 2009; Feldmann & Ham, 2015). Among many drivers such as quality, freshness, taste, appearance, and sustainability consumers' characteristics play an important role in consumers' decisions to buy local products. Studies show that socio-demographic characteristics such as age, gender, income, education, and type of residency (e.g. rural vs. urban) affect premiums for local products (Carpio & Isengildina-Massa, 2009; Loureiro & Hine, 2002; Meas et al., 2015; Printezis et al., 2018; Tregear & Ness, 2005). According to the World Bank (2016), consumers living in rural and urban locations show different preferences toward purchasing local food. Rural consumers exhibit differing values than urban consumers for purchasing local food, which roots in distinct cognitive structures motivating the purchase of local food (Roininen et al., 2006). Various values for locally produced products in rural and urban lead to diverse consumers' decisions and WTPs for local food (Moser et al., 2011).

The government has tried to increase consumers' awareness and motivation towards purchasing local food through activities such as agricultural and food

exhibitions, nutrition campaigns and promotion through television or other mass media. "Farm to Table" program in South Carolina is an example of promotion programs developed by the South Carolina Department of Agriculture to promote South Carolina grown and processed products through producers, processors, wholesalers, and retailers. "Farm to Table" specifically helps local restaurants to use food hubs in order to source local food. One program designed for chiefs in South Carolina is "Find the Fork," which was established in 2011 and aims to provide a central place for offering South Carolina freshly harvested products to operators of restaurants, institutions, and grocery stores. Table 3.1 represents more examples of the efforts of Departments of Agriculture where they have developed many state-level programs promoting local food.

In a study by Asil et al. (2018) local food promotion through government was indicated as one of the most effective factors in rural consumers' preferences for local food. One example of such programs is the "Buy Local" program by the Kentucky Department of Agriculture, with the main goal of encouraging local restaurants to purchase their ingredients from local farmers and receive up to 15% reimbursement as an incentive (Kentucky Department of Agriculture, 2020). The "Buy Local" program is an effort to answer consumers' demand for local food through incentivizing restaurants and their providing distributors for purchasing produced food in Kentucky (Kentucky Proud). As mentioned, this program is not especially consumer-facing; instead, it emphasizes restaurant reimbursement based on qualified local purchase sales. Currently, this program is being implemented statewide in Kentucky. However, the effectiveness of the promotion program increases as the program gets wider and adopted by more participating restaurants. This concept relates to the network effect theory, an economic

framework developed by researchers Michael L. Katz, Carl Shapiro, Joseph Farrell and Garth Saloner (Blind, 2004).

The network effect discusses that increasing the number of people or institutions in the network increases the value of some goods and services. For example, the more people accept and utilize IOS operating systems and Apple Apps, the more desirable and valuable it becomes for investors to invest in those Apps. Another example of the network effect or "demand-side economies of scale" is social media, where more people communicating with them increase the value of such media. Economides (1996) argued that a higher number of people in the market (i.e., higher demand-side economies of scale) enlarges the value for a unit of a good in the market, which eventually leads to higher willingness-to-pay for the product. The same concept applies to the effectiveness of the Buy Local program. As the number of restaurants in the program increases, consumers' values, preferences, and WTP for local sourcing in restaurants increase. Considering the insignificant marginal cost of local sourcing for restaurants (Starr et al., 2003; Sharma et al., 2009), understanding a potential rural consumers' interest in local sourcing could inform the government about the benefits of adopting a local promotion program in rural restaurants.

Therefore, this study serves as a string point of three streams of research on the local food value chain. First, state and local governments have developed various local food promotion programs like "Fresh on the Menu" in South Carolina, or "Buy Local" in Kentucky; however, the success of these programs depends on appropriate measurements and criteria to evaluate their performance. This study provides information for state brand programs to improve their design. In addition, evidence on consumers' positive WTP for

local food in rural setting help state and local governments to consider strategies for local food promotion that include restaurants and consumers in rural and urban settings. Second, in today's competitive market, restaurants need to know the feasibility of differentiating themselves to answer their patrons' demand for local food. Information on consumers' WTP in rural settings helps restaurants to determine whether local sourcing is profitable for their business. This study guides the restaurant's owners to identify the feasibility of offering local food on the restaurant's menu in different geographic areas as well as the extent to which their consumers are willing to pay. While the information obtained from the first essay is valuable to understand consumers' WTP across dining formats, it does not show potential differences in different residing settings. Yet, positive consumers' WTP in a rural setting in different formats of dining suggest distinct market segments and their sizes. Third, positive consumers' WTP in rural and urban settings for local food suggests a viable opportunity for rural restaurants to differentiate themselves in the market, which leads to economic development.

3.2. Background and Previous Literature

This section presents an overview of the previous literature on consumers' WTP for local food. The reviewed literature is organized as follow: previous research on consumers' WTP or local food, and how it is measured, a review of local food promotion programs developed by Departments of Agriculture across the country, and evaluation of their effectiveness, identifying effective factors on consumers' WTP including the effect of the residency setting, and lastly, consumers' WTP for local food in restaurants in rural and urban communities.

Prior research has investigated consumers' willingness to pay for local food. Penny and Prior (2014) explored the perception and attitudes of urban consumers towards local food. They conducted an experiment using four groups of participants. The authors concluded that urban consumers' higher interests in purchasing local food do not necessarily lead to higher purchasing behavior of these products. The results showed the most important barriers to buy local food were availability, price, and united labeling whereas the most effective drivers of purchasing local products were identified as freshness, health benefits and quality.

Another study by Burnett et al. (2011) examined consumers' WTP for locally grown fresh products based on the geographic scale. The authors designed a survey using different scenarios asking the respondents about the degree the price premium for locally sourced fresh products varied by geographic intervals. Their results revealed that approximately 85% of the respondents in the sample are willing to pay a higher premium for locally grown products. The authors also found by shrinking the geographic scale, more respondents are willing to pay for local food and the premium they will pay increases. Shi et al. (2015) used a multi-store auction to estimate consumers' WTP for local blueberries. Consumers were chosen from multiple marketing outlets, including price-conscious grocery stores, quality-focused grocery stores, and farmers' markets. They found that consumers are willing to pay more for local blueberries in quality-focused grocery stores and farmers' markets.

Hu et al. (2011) implemented a modified payment card approach to estimated consumers' WTP for value-added blueberry products in Kentucky. Results suggest consumers have a positive WTP for various blueberry products. In addition, consumers'

socio-demographic characteristics like age, income, and education are effective on consumers' WTP; however, consumers' health related factors, such as diabetes and heart problems are not affective on WTP for blueberries. In another study by Hu et al. (2009), a conjoint choice analysis was conducted to estimated Kentuckian consumers' WTP for local, organic, and sugar-free blueberry products. They found consumers have a positive WTP for local and organic blueberries.

The conjoint choice analysis is one of the prevalent methods for capturing consumers' preferences for products attribute. Darby et al. (2006) studied consumers' WTP for locally grown fresh strawberries using a customer-intercept survey and a choice experiment of food shoppers in a variety of direct markets and traditional grocery stores. The results revealed that consumers are willing to pay an average of 64 cents more per quart for fresh strawberries in supermarkets while the premium they are willing to pay at farmers' markets is $1.7 higher per carton of locally grown strawberries.

Local food promotion programs are one of the government activities to support locally grown products since 1960. The effectiveness of government investments in such programs has always been questioned. "Buy Local" program is a local food promotion program by the Kentucky Department of Agriculture mentioned in the last section. A survey was conducted in 2016 by ThinkNew on the effectiveness of this program across different market channels including farmers' markets, grocers, and restaurants. In the restaurant survey, 25 business owners from fine dining restaurants to bakeries, cafes and caterers were interviewed over the phone. Findings show these businesses have participated in KY Proud for an average of 5.4 years. Respondents stated an average of 40% to 45% yearly purchase of KY Proud products. In addition, the survey suggests that,

generally, restaurants like participating in the KY Proud program because of several benefits for their businesses, including serving better quality of fresh products to answer their consumers' demand, helping local farmers, and offsetting costs of buying local through this program. On the other hand, the respondents indicated that the program needs some improvements in re-paying their reimbursements, defining a standard to signal consumers about the integrity of the program, and facilitating restaurant participation in the program. Specifically, restaurants are interested offering a clear definition to their consumers of what it means to be a member of the KY Proud program (ThinkNew, 2016).

In a study by Loureiro and Hine (2002) a comparison was conducted of consumers' WTP for local, organic, and GMO-free (Genetically modified organism) products in Colorado. The authors conducted a survey using a payment card format, where they asked the respondents to bid on the unique attributes of products such as organic, locally grown, and GMO-free. The respondents were presented with the following bid intervals: $0, less than five cents per pound, between 5 and 10 cents per pound, between 11 and 15 per pound, 16-20 cents per pound, and more than 20 cents. In total, 437 questionnaires were collected. The results showed that consumers are willing to pay a potential premium of about $9.37 per pound over the initial price. The authors discussed that the high WTP for locally grown products is partly because of the promotion campaigns in Colorado such as "Colorado Proud", which increased consumers' awareness about locally grown products. Therefore, Colorado-grown potato was identified as the best niche market for Colorado potato producers. Yet, there is a lack

of agreement among scholars on the drivers of consumers' interest in potential local food niche markets.

Consumers' interest in local food is affected by several factors and has been investigated in many studies (Arsil et al., 2014; Brown, 2003; Kezis et al., 1998; Chambers et al., 2007; Zepeda & Deal, 2009; Giraud et al., 2013; Memery et al., 2015; Conner et al., 2010; Feldmann & Ham, 2015; Hu et al., 2012). Residency region is one of the determinants of consumers' preferences for local food. Arsil et al. (2018) investigated consumers' preferences for local food in the urban and rural context. The authors conducted face to face interviews in urban and rural locations on Java Island, Indonesia with over 600 respondents. The results of the factor analysis show that food quality, support for local food, availability, tradition, and packaging are the similar influencing concepts of local food purchase in rural and urban contexts. The authors concluded although the perception of local food might be different in urban and rural areas, the factors influencing consumer preference for local food are remarkably homogenous regardless of location.

Lockeretz (1986) investigated urban consumers' attitudes toward locally grown produce. The author conducted interviews with more than 600 consumers at farmers' markets and supermarkets in different urban and suburban areas in Massachusetts and at agricultural fairs. Interviews included questions such as consumers' reasons for purchasing fresh products, consumers' preferences for local food, and the reasons that might motivate them to buy local produce. The results show consumers consider paying for local food if they are presented in a locally oriented environment (e.g., farmers'

markets) where the consumers have the opportunity to purchase local food directly from the farmers.

Another study by Schneider and Francis in 2005 explored consumers' preferences for locally grown products in Nebraska. The authors conducted a survey on consumers and farmers in Washington County. They asked respondents about their opinions and preferences for local production, marketing, and purchasing. The results suggested farmers in Washington County were more interested in producing and marketing conventional corn and soybean. Farmers in the sample stated lower interest in producing for local markets. On the other hand, consumers indicated that they are willing to pay a premium for purchasing locally grown products from farmers' markets, local grocery stores, local restaurants, and directly from farms. Consumers in the sample demonstrated reasons including quality, taste, environmentally friendly production, and support for local farmers for purchasing local food. Therefore, the authors concluded that despite the reluctance of farmers in local markets there is an exceptional potential market for producing and marketing local products in Washington County.

Consumers' WTP is affected by individuals' preferences defined by subjective personal tastes for a distinct attribute of a product (Zikmund & Babin, 2010). Prior research studied consumers' WTP for various products. However, a few of them measured individuals' WTP for local food based on patrons' residency settings. Hempel and Hamm (2016) used a choice experiment on 641 consumers in eight German regions to investigate consumers' preferences and WTP for local food. The results of the mixed logit models showed that consumers have high preferences for local food. The authors also found that consumers' interest in locally grown products changes depending on

consumers' place of residence. For example, their results suggested consumers living in a rural area have lower WTP for organic food than consumers living in an urban area.

A nationally representative consumer survey conducted by Lobb et al. (2006) in the United Kingdom examined consumers' attitudes and WTP for local and national food vs. imported alternatives. The authors designed a questionnaire using choice modeling for a pack of fresh lamb chops and a pack of fresh strawberries. They interviewed a nationally representative sample of 222 respondents. The results of the study revealed that respondents have a positive attitude towards local food purchase. The choice experiments suggested that consumers' WTP for local products is high. Yet, seasonality, income, and consumer's place of residence are affective on consumers' decision to purchase local food. Specifically, the authors showed that consumers living in urban areas are willing to pay more for locally grown products.

Another study by Burchardi et al. (2005) explored consumers' WTP for local milk. Their results suggested that consumers have high preferences for milk from their own region, and they are willing to pay a higher premium for purchasing local milk. Also, they found residents in rural areas have a higher WTP for milk from their own region. The authors discussed that the reason for higher WTP for the rural population might be due to their stronger attachment to the local agricultural sector. Sparling et al. (2002) investigated the potential differences in rural and urban consumers in their local food preferences and purchasing behavior in Colorado. They sent a mail-out survey using the National Family Opinion Inc. (NFO) panel to three geographic regions: The Front Range of Colorado between Fort Collins and Colorado Springs, The Western Slope of Colorado, and Northern New Mexico and Southern Colorado. The respondents were

asked to specify three prices for the locally produced meats based on the special qualities. The authors found that residents in urban and rural areas have a high interest in purchasing local food. Specifically, the respondents stated that 20% of urban populations and 24% of rural populations purchase local beef regularly. Also, their results show that urban consumers are willing to pay a higher premium for steak while rural consumers have higher WTP for ground beef.

Ha et al. (2019) conducted an urban vs. rural comparison study to investigate rural and urban consumers' preferences for organic vegetables in Vietnam. The results of this study showed rural consumers are willing to pay a higher premium for organic food. The authors discussed that the reason for lower WTP in urban regions is the very high price of organic vegetables and the relative lack of trust in organic labels.

Consumers' preferences for local food and their willingness-to-pay a higher premium for local products make restaurants answer their patrons' desire. Charging higher prices (Alfnes & Sharma, 2010; Ortiz, 2010) and differentiating the restaurant brand among other competitors (Grunert, 2005) are only some advantages of offering locally grown products on the menu for restaurants. However, estimating the marginal benefit of local sourcing for the restaurant depends on consumers' WTP for locally sourced ingredients. While many studies have estimated consumers' WTP a premium for local foods in different settings, a few have explored consumers' WTP for locally grown products in restaurant settings. Sharma et al. (2014) studied the effect of restaurant managements' attitudes and behaviors on local sourcing decisions. The authors used a value chain framework to understand the determinants of restaurants' decisions to purchase local ingredients. Their results revealed that managements' decisions, order

processing time, and uniqueness of products are the most significant reasons for restaurants' local sourcing.

Alfnes and Sharma (2010) investigated restaurant patrons' preferences and WTP for local food. The authors conducted a field experiment in restaurants located on a Midwest US university campus, offering consumers the choice of two set menus different based on price and origin of food. Their results showed that consumers are sensitive to price signals. That is, consumers purchase local food more frequently when it is offered at a higher price on the restaurant menu. The authors argued in the market, when there is a lack of labeling or standard for locally sourced products, higher prices could signal consumers about the quality of the local products and increase their preferences and interest in purchasing local food. In other words, consumers perceive the value-added of paying a higher price for the local food outweighs the negative effect of a higher premium.

Contini et al. (2017) argues that knowledge about consumers' meal consumption away from home is still progressing. The authors studied the relationship between local food presented in restaurants and consumers' positive preferences. A choice experiment method was conducted to capture consumers' preferences for product attributes such as certification of origin, process certification, price, and the main characteristics of the restaurant. Applying latent class analysis, the results show consumers are willing to pay a premium for "locally grown" labeled food in a restaurant. The group with the highest willingness to pay are named "locavores", who are characterized as people who prioritize self-enhancement, stimulation, and conservation in the sense of respect for traditions and being members of their communities. Also, their results suggest that consumers'

preferences are heterogenic across the market. Ortiz (2010) used questionnaires to collect data from on-campus patrons about their preferences and WTP for locally sourced food in the dining. Results from ANOVA analysis suggested consumers are willing to pay premiums for local food featuring on restaurants menus, especially consumers have the highest WTP reported $8 for meat.

Inwoods et al. (2009) investigated chefs' insights in promoting local food systems. The authors collected data through interviews from 71 restaurants, which largely utilize locally grown ingredients. The results suggested food qualities like taste and freshness are the most important qualities from the chefs' point of view. However, production standards are not problematic to chefs' choice for local sourcing. In order to promote local foods, chefs utilize signage, wait staff, and cooking classes. Chefs also indicated that structural barriers such as distributional problems and lack of convenience are among limitations for utilizing local food in restaurants.

Another field experiment in restaurants by Ellison et al. (2013) examined the effect of signaling consumers about the amount of food calories on the menus. They assigned patrons randomly to one of three menu treatments providing information about food calories including none, numeric, or symbolic calorie labels. Results show people who are less concerned about their health were affected the most by the calorie labels. In addition, symbolic calorie labels are the most influential labels on patrons, even on the most health conscious consumers.

In the context of consumers' preferences for local foods appearing on restaurant menus, studies show food quality, service quality, price, location, atmosphere, and past experiences are the most important factors in patrons' choice of restaurant (Medeiros &

Salay, 2013; Alonso et al. 2013; Frash et al. 2015; Jung et al. 2015). Yet very few numbers of research have investigated the costs of using local foods in restaurant settings. Some studies show the production costs and sourcing of local foods are not significantly different from non-local items in independent restaurants (Starr et al., 2003; Sharma et al., 2009).

In another part of the study by Sharma et al. (2009) investigated the economic costs and benefits of offering local food in a restaurant. They collected data from ten small restaurants in the U.S., where the respondents were asked to choose from three locally sourced menu items representing starts, dishes, side orders, and desserts. The results of data envelopment analysis (DEA) show that the only significant difference between locally sourced ingredients and non- local foods is the delivery time, while no statistically significant difference was found in the sourcing time or food cost of local and non-local ingredients. In this picture, the role of consumers' WTP for local foods in a restaurant that could offset the local sourcing expenses and increase restaurant marginal benefit remains to be further investigated.

Although the existing literature provides valuable insight on consumers' WTP for local food and the effective factors on the WTP; however, no study has investigated a potential difference between consumers' WTP for local food in rural and urban communities across alternative restaurant formats. In the following sections, we aim to examine a potential positive WTP for local food between urban and rural patrons for local sourcing in fast casual and casual dining formats. In addition, we seek to determine the extent to which rural consumers are willing to pay for local food in restaurants and

whether there is a potential market to make a local food promotion program such as “Buy Local” worthwhile in rural restaurants.

This study contributes to the WTP literature for local food and explores potential differences in consumers’ WTP for locally sourced ingredients in three dining formats, including fast-casual, casual, and fine dining. To the best of our knowledge, there is no study that investigated WTP in different residency types across alternative restaurant formats. We believe that consumers’ preferences for local food are not homogenous across various dining formats. Hence, this study focuses on identifying market shares and consumer characteristics as well as WTP estimations for each group of consumers in fast-casual, casual, and fine dining formats. The insight into rural-urban differences in WTP across alternative restaurant formats will provide information for food policymakers involved in local food promotion programs (e.g. Buy Local in Kentucky) and food institutions (e.g. restaurants) to adopt center their marketing strategies to each region.

3.3. Methods

In this study, we implemented the Latent class model (LCM) to estimate our results. LCM assumes consumers’ choice behavior depends on the observable and unobservable factors. One of the advantages of using LCM is that the model provides discrete segments of the sample based on consumers’ choices and preferences. Another advantage of implementing LCM is that this approach captures the heterogeneity among various subgroups of consumers using multivariate clustering techniques based on a probability model (Greene & Hensher, 2003).

3.3.1 Choice Experiment Estimation and Latent Class Model

The theoretical foundation of this study has its roots in the random utility theory of McFadden (1973) and the Lancastrian microeconomic approach (1966). The McFadden theory states human choice behavior forms by different attributes of a product. On the other hand, Lancaster (1966) is the theory used to develop conjoint choice estimation (CCE) and suggests that consumers maximize their utilities arise from the product, itself, and the possessed characteristics of the product.

In the setting of this paper, we assume that consumers maximize their conceived utility obtained from consuming local foods based on local food attributes, including freshness, taste, quality, improving local economy, and healthiness.

3.3.2 Empirical Approach

This study used the conjoint choice experiment (CCE) developed by Louviere and Woodworth (1983) to design the surveys. CCE assumes consumers' preferences for distinct attributes of a product and their levels define individuals' purchase behavior and decisions, and eventually, affects consumers' WTP for the product. Our survey was conducted on 2,228 respondents including 1,292 respondents from rural communities and 936 respondents from urban communities in the state of Kentucky.

In our study, rural and urban consumers self- selected themselves into their communities by answering to the question of "Which of the following best describes where you currently live?" in the survey. The alternative responses include "Larger City (Lexington, Louisville, Northern Kentucky)", "Suburban area outside larger city", "Smaller city (i.e. Elizabethtown, Bowling Green, Pikeville, etc)", "Rural (but not a

farming community)", and "A farming community". Based on their responses we categorized the respondent into a rural group if they chose "Rural (but not a farming community)", or "A farming community", and into an urban group if the respondents answered " Larger City (Lexington, Louisville, Northern Kentucky)", "Suburban area outside larger city", and "Smaller city (i.e. Elizabethtown, Bowling Green, Pikeville, etc)".

We categorized restaurants into three dining formats, including fast-casual, casual, and fine. We assume each of these dining formats possesses unique characteristics, which affect consumers' WTP for local sourcing in each type. Furthermore, we consider three types of dining formats to examine one of the assumptions of this study on whether WTP for local sourcing across alternative restaurant formats changes for consumers in urban vs. rural. In other words, we are interested in understanding the potential of implementing local food promotion program for fast-casual and casual rural consumers. Based on an article named "Types of Restaurant" from Wikipedia, we defined each dining format in the survey to make these concepts as easy and unified as we can for the respondents. These definitions include:

Fast-casual dining - A restaurant that is slightly more upscale than fast food. Fast-casual restaurants offer disposable dishes and flatware, but their food tends to be presented as more upscale, such as gourmet breads and organic ingredients. Open kitchens are popular with fast-casual chains, where customers can see their food being prepared

Casual dining - A restaurant that serves moderately priced food in a casual atmosphere. Except for buffet-style restaurants, casual dining restaurants typically provide table service. Casual dining restaurants often have a full bar with separate bar staff, a larger

beer menu, and a limited wine menu. They are frequently, but not necessarily, part of a wider chain, particularly in the US.

Fine (white tablecloth) dining - A restaurant that is an upscale restaurant that offers diners an elegant atmosphere with high-quality service. The chefs are usually professionally trained, and the food is expensive but worth it.

In the following question, we asked the respondents to answer, "How many times per month, they visit each of the dining formats?" They could choose among 'None or less than 1', '1-2', '3-4', '5-6', '7-8', '9-10', and 'More than 10'. Then we asked our sample to self-select themselves to one of the restaurant formats based on their monthly visit to each type. We specifically asked them to select fast-casual dining if their monthly visit made up more than 60% of their total visit to all three formats, casual dining if their monthly visit made up more than 30% of their total visit to all three formats, and fine dining if their monthly visit made up more than 10% of their total visit to all three formats. The respondents were directed to the questions designed for the specific dining format that they chose based on their answer to the last question.

Regardless of the type of restaurant, each respondent was provided with nine questions asking about their preferences for two distinct sets of attributes, set (A) and set (B). Also, to minimize the hypothetical bias, we provided the respondents with an opt-out option in each question. Following Torjusen et al. (2001) as well as Padel and Foster (2005), we defined product attributes as price, local ingredients, and driving distance to explain consumers' purchase behavior. Table 3.1 represents the selected attributes and their levels. We utilized a fractional factorial design to design the attributes' profiles and select a sample of attribute levels from total possible profiles (5x4x4x4x3x4) ((attributes)

x (fast casual dining prices) x (casual dining prices) x (fine dining prices) x (driving distance levels) x (local sourcing)).

In this study, we constructed different sets of randomly developed and separated pairs of profiles. Each set consists of nine pairs of profiles. The experiment design directly asked respondents to pick the most preferred profile among randomized choice sets. Table 3.3 shows an example of the choice sets presented to respondents in the casual dining restaurant. In order to minimize the hypothetical bias, we offered an "opt-out" option on the survey representing respondents' unfavorable opinion about options "A" and "B". This option is shown as "No-Buy" in the results section, defining as 1 if the option is "No-Buy", and 0 otherwise.

In our study, the level of local sourcing in the restaurant is the most important attribute in consumers' WTP and purchase behavior. Given the purpose of this paper, the definition of local sourcing attribute is crucial. However, presenting this attribute to the respondents is complex. To solve this problem, we used a tractor designation system developed by the Lexington Visitor Center (VisitLex) in their culinary restaurant directory for residents and visitors walking tours about Lexington dining called *Beyond Grits* (Figure 3.1). In this guidance, local sourcing is signaled to consumers by marking a small blue tractor  next to the name of the restaurant, representing the amount of dollars invested in local farms by local restaurants and businesses purchase of locally grown products. The tractor symbol ranges from zero to three located next to the name of the restaurant in the book where no tractor symbol means the restaurant does not participate in local sourcing activities, while one, two, and three tractors mean the

restaurant invests up to $14,999, between $15,000 to $29,999, and over $30,000 in local farms, respectively (Figure 3.2).

The price levels were chosen based on the restaurant format ranging from $14.99 to $26.99 in fast casual dining, from $34.99 to $46.99 in casual dining, and from $49.99 to $60.99 in fine dining format. In order to address any hypothetical bias in terms of the worthiness of the meal for the paid price, we asked respondents to assume a typical meal for two people in that type of dining and choose their favored price option based on that. For instance, the assumption of the price for a meal for two in the casual dining format is as follow:

"Assume that this is a typical meal for two, which would include: Two soft drinks, two meals (pasta, sandwich, or gourmet salad), and two desserts."

Finally, the driving distance levels were chosen considering the restaurant being in the state of Kentucky. The driving intervals starts from the minimum driving time of 10 minutes up to a maximum driving distance of 30 minutes. This range includes most restaurants within the urban and rural residency.

The residency variable was defined using a self-assigning question in our sample. We asked the respondents to select the option, which best describes their current living residency. The options include 'Larger City (Lexington, Louisville, Northern Kentucky)', 'Suburban area outside larger city', 'Smaller city (i.e. Elizabethtown, Bowling Green, Pikeville, etc)', 'Rural (but not a farming community)', and 'A farming community'.

3.3.3 Survey

The survey consists of four sections. The questionnaire opens with questions about consumers' monthly spending on restaurants (includes fast casual, casual, and fine dining). The section continues with providing the respondents with the definitions of symbols and dining formats. At the end of this part, we asked consumers to self-select themselves into one of the dining formats (i.e., fast casual, casual and fine dining) based on their number of monthly visits to each restaurant.

The respondents were directed to the selected type of dining in the second section, where they answer nine choice questions concerning the choice experiment (Figure 3.3). Questions regarding consumers' interests in local food and preferences for different marketing channels are addressed in the third section. We asked the respondents to rate the local food importance in their purchasing decisions, as well as the number of times the consumers purchase from different local food channels (i.e., farmers markets, grocery stores, restaurants) within the last 12 months. Finally, the last section includes socio-demographic questions.

3.3.4 Data

Data was collected through a survey using Qualtrics platform in the state of Kentucky in December 2018 and early January 2019, employing 2228 respondents. The survey was conducted in two phases. The first round obtained 1600 observations without enough rural sample. The second phase was conducted with a screen question to collect information from rural consumers, only. In the second round, 628 observations from rural residents were collected. Our sample criteria include that the respondents being Kentucky

residents and at least 18 years old. We cleaned the data by omitting those respondents who chose “I do not consent” to the terms of the study, and those who answered the survey under 129 seconds. We believe these respondents probably did not read the survey completely and their responses are not reliable. We also eliminate those responses which did not complete the survey as well as spurious responses. Finally, we dropped those responses with more than two expenditure categories apart from the self-reported question of ‘spending on restaurants’, a consistency filter we included for our core question early and late in the survey.

3.3.4.1 Socio-demographics of Survey Respondents

Descriptive statistics of the sample are reported in Table 3.4. Most of the sample, between 72% and 81% of respondents, consist of females in both rural and urban. Similarly, between 79% and 93% of the sample were white; however, the percentage of white respondents was higher in rural setting. The mean age is between 44 and 50 years old in the rural settings whereas the age average in the urban setting is between 41 to 49 years old. The education distribution shows that mean of years of education for rural consumers were between 13 and 14 years whereas urban consumers in fine dining had higher average years of education, around 15 years. The average household income for rural consumers in fast-casual restaurant is $43,540 vs. $51,040 for urban consumers. Fine dining consumers have the second-highest average income, $85,860 in urban and $62,980 in a rural setting.

Interest in local food was measured by asking respondents about the frequency of purchasing local food within the last 12 months from different market channels. We also asked the respondents to indicate, “How important is local food to your consumer

choice?". In Table 3.4, we employed the responses to validate the purchase frequency questions. Between 39% and 59% of respondents stated to have moderate to strong interest in local food purchase from different market channels (farmers' market, grocers, and restaurants). Further investigation of interest in local food variables showed fast-casual dining customers in rural regions purchased local food, on average, 1-5 times from grocery stores, farmers' market and 1 restaurant in the last month.

On the other hand, urban consumers in fast casual dining purchase local food 1-5 times from farmers' markets and restaurant, and 6-10 times from grocery stores. Rural and urban consumers in casual dining purchase local food 6-10 times from grocery stores, which is higher than other purchasing from other market channels. Fine dining customers in rural and urban settings stated a higher average number of purchases from all market channels among other types of restaurants.

3.4 Results

Latent class analysis requires deciding on the number of segments to estimate consumers' segment regressions. Tables (3.5-3.7) represent results from the Akaike Information Criterion (AIC), Log Likelihood (LL), and Bayesian Information Criterion (BIC). Following Ben-Akvia and Swait (1986), BIC value for rural respondents shows four, two, and two segments are the optimal distinguished subgroups in pour sample for fast-casual, casual, and fine dining formats, respectively. However, in urban respondents, the minimum BIC value determines that latent models with four, three, and two classes optimally identify consumers' classes in our sample for fast-casual, casual, and fine dining format, respectively.

3.4.1 Results Following BIC Criteria

We estimated two different latent model representing rural and urban respondents for each dining format (Tables 3.11-3.16). The alternative-specific conditional logit models were evaluated using STATA 14 software package. Regression models include the likelihood of choosing any of three provided options (e.g., option (A), (B), or neither) as a dependent variable and nine sets of choice profile along with socio-demographic variables as independent variables. Tables (3.11 -3.16) represents results following BIC guideline for the number of classes. The post estimation results of WTP does not provide realistic values. For example, LCM estimations for fast casual customers in urban settings show that consumers are willing to pay $0.75 for an extra driving mile (Table 3.17).

3.4.1.1 LCM Results for Rural Consumers across Alternative Restaurant Formats

Results of the parameter estimation of the latent class model for rural residency setting in fast-casual dining, (Table 3.11) show the class with the highest value for local food (highest WTP for local food) includes the largest share (about 45%) among four classes. WTP for this class is $6.56. Also, for FC consumers, ‘local sourcing’ in a rural setting, consumers with the lowest share (12%) in the sample is not significant. Moreover, the group of consumers with the highest WTP are younger with higher education and income, relative to the reference group. The reference group is the group who has the lowest share in our sample and are willing to pay -$1.35 for one unit increase in the amount of local sourcing (e.g., additional amount of local sourcing from $14,999 to $15,000 and from $29,999 to $30,000 and over).

For casual dining and rural consumers (Table 3.13), the class with the highest value for local food (highest WTP for local food) has the largest share (about % 71) in the sample. This group of consumers is younger with higher education and income, relative to the reference group.

For fine dining consumers in a rural setting (Table 3.15), the group with the highest share of consumers (75%) is willing to pay $5.78 for the restaurant's local sourcing. The other group's WTP for 'local sourcing' is $0.06, and represents people with lower income, relative to the reference group (i.e. the group with the highest value for local food).

3.4.1.2 LCM Results for Urban Consumers across Alternative Restaurant Formats

Results of the parameter estimation of the latent class model for urban residency setting in fast-casual dining (Tables 3.12) show the class with the highest value for local food (highest WTP for local food) includes the largest share (about 36%) among four classes. WTP for this class is $6.61. In an urban setting, 'local sourcing' is statistically significant for all consumers' segments. For FC consumers in the urban setting, the group with the lowest WTP ($0.54) for local food represents 18 percent of the sample, which includes people with lower education.

For casual dining and urban consumers (Table 3.14), relative to the reference group (with 21% share and $1.01 WTP for local food), the class with the highest value accounts for 68% of the sample and represents younger people with lower education and higher income, who are willing to pay for local food represents younger people who are willing to pay $5.05 for local food in a casual restaurant. Yet, the urban group with the

lowest WTP ($0.06) for local food represents 11 percent of the sample, which includes males with lower education and lower income.

For fine dining consumers in an urban setting (Table 3.16), the highest WTP is $5.97, and belongs to the group of consumers with the highest share (86%). The lowest share class (14% of consumers) describes older people with lower income, relative to the highest share group.

3.4.2. Results Estimating Three Classes

We estimated LCM in different settings with fewer number of classes of consumers. Our results show that the model does not behave normally by adding to the number of sub-groups and is sensitive to that. LCM regressions obtain the most realistic results when number of classes is equal to three. Moreover, comparing BIC values in different settings across alternative restaurant formats suggest that there is a very small differences between BIC value for LCM with three classes and that of LCM with four or two classes. Therefore, in order to save the consistency of the results we decided to present the second set of LCM results with three classes as well as WTP values for all restaurant formats (Tables 3.18 – 3.24).

3.4.2.1. LCM Results with Three Classes for Rural Setting

For fast casual consumers in a rural setting, LCM with three classes is represented in Table (3.18). The results show the group with the highest value for local food is the largest share (58%) and are willing to pay $4.07/tactor (one more level of local sourcing). This group of consumers includes younger individuals with higher education. The group

with the lowest share (12%) in fast casual dining, rural settings are older consumers whose WTP is $-1.37.

In casual dining, rural consumers with a WTP of $4.91/tractor are the largest class (63%) among other classes. This group includes younger consumers. On the other hand, the class with the smallest share (11%) are willing to pay $-1.80/ tractor. In fine dining, rural consumers with the largest share (71%), are willing to pay $5.98/tractor. However, the smallest class (12%) pay $1.64 for local food in fine dining.

3.4.2.2. LCM Results with Three Classes for Urban Setting

In fast casual dining, urban consumers with the largest share (66%) pay $3.99/tractor. The smallest share (11%) group includes older, lower-income consumers who are willing to pay $-3.77/tractor.

In casual dining, younger urban consumers include the largest group (68%) among other classes and are willing to pay $5.05 while male consumers in an urban setting with lower education and income include the smallest class (10%) who pay $0.06/tractor. In fine dining, the highest WTP is $5.51/tractor, while older urban consumers with lower income are willing to pay $-2.37/tractor and include 12% of the urban consumers in fine dining.

3.5 Conclusions and Implications

In this study, we estimated urban vs. rural restaurant consumers' preferences and WTP for 'local sourcing' across alternative restaurant formats using LCM analysis. We seek to understand differences in consumers' preferences for restaurant local sourcing in urban and rural settings. Also, we were interested in identifying consumers' segments and

their shares with a higher value for ‘local sourcing’ and whether there is any meaningful difference between consumers’ WTP for local food across alternative restaurants in rural and urban communities. LCM results for rural and urban patrons suggest there is class interest for ‘local sourcing’ in restaurants not only in fine dining format but also in the fast casual and casual dining formats in an urban setting. In addition, rural respondents indicated that they are interested in ‘local sourcing’ and are willing to pay a premium for that in restaurants. Surprisingly, WTP comparison for ‘local sourcing’ intensity and ‘driving distance’ in urban vs. rural settings across alternative restaurant formats (Table 3.17) show there are small differences between the highest WTP in rural and that of urban settings across alternative restaurant formats. Furthermore, LCM results show ‘age’, ‘gender’, ‘income’ and ‘education’ are effective on consumers’ purchasing behavior and WTP for ‘local sourcing’ across restaurants in both settings.

These findings provide some insights on the effectiveness of the Department of Agriculture’s local food promotion program. Programs like “Fresh on the Menu” in South Carolina, or “Buy Local” in Kentucky are funded by the Departments of Agriculture, and information on the performance of their local food promotion programs could assist them in re-evaluating their strategies and improving their programs’ design. Our results show a positive WTP for local food in restaurants in rural as well as urban communities. This outcome suggests there is a potential market for restaurants’ patrons in rural communities; therefore, the Department of Agriculture could use this information and expand their local food promotion programs to rural communities in order to help farmers, improving the local food system and rural economies, and increasing families and individuals access to fresh food. The expansion of such programs is feasible because

of the small marginal cost of extending an urban program to a full statewide local food promotion program vs. a program limited to urban areas. Moreover, spreading programs such as 'Buy Local' program in Kentucky and engaging more members in the program will increase the other members' value driven from this program, which is called "Network Effect". This effect is the marginal benefit gained by an existing member for each new member that joins the program. In other words, the benefit obtained from a local food promotion program like "Buy Local" is higher for an existing farmer in the program when a new restaurant located in a rural community joins Buy Local, and vice versa. Therefore, expanding the program to rural communities provides a huge value to all other members of the program.

Another marketing implication of this study benefits restaurant owners in rural communities. Small owner-operated rural restaurants are uncertain about the profitability of offering local food on their menus. However, our results regarding consumers' positive WTP for local food in rural communities provide some evidence of the positive effect of offering local food in restaurants in rural regions on attracting consumers, increase profit margins, and differentiating restaurants in the market.

Finally, improving the local food system in rural communities not only increases patrons' access to fresh food but also expands economic vitality and sustainability and creates new business opportunities. Some examples of boosting the business environment in rural communities are Corbin, Kentucky and Postville, Iowa, which offer local food through restaurants and food trucks.

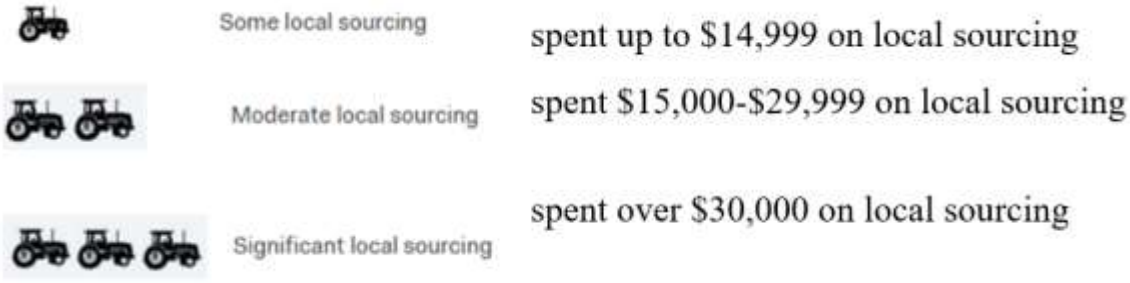
Our study has some limitations. First, collecting data through a survey might be a source of potential hypothetical bias, where respondents overestimate their willingness to

pay. Although, in this study, different strategies were utilized to minimize this bias, yet future studies could conduct field experiments to capture a better understanding of restaurants' patrons in rural and urban communities. Another limitation of this study is asking the respondents to self-select themselves in to the following residency communities " Larger City (Lexington, Louisville, Northern Kentucky)", "Suburban area outside larger city", "Smaller city (i.e. Elizabethtown, Bowling Green, Pikeville, etc)", "Rural (but not a farming community)", and "A farming community". In spite of providing some examples for each option, the definition of choices might not be clear to all the respondents resulting in inaccurate urban and rural group identification. Therefore, future studies could utilize survey methods like cluster sampling to select observations from rural and urban communities based on their study standard definitions of rural and urban.

Figure 3.1 Beyond Grits-VisitLex walking tours about Lexington dining

Source: VisitLex.com

Figure 3.2 Bluegrass Guide Tractor Designation



Source: Beyond Grits, VisitLex

Figure 3.3 Logic of Survey Flow

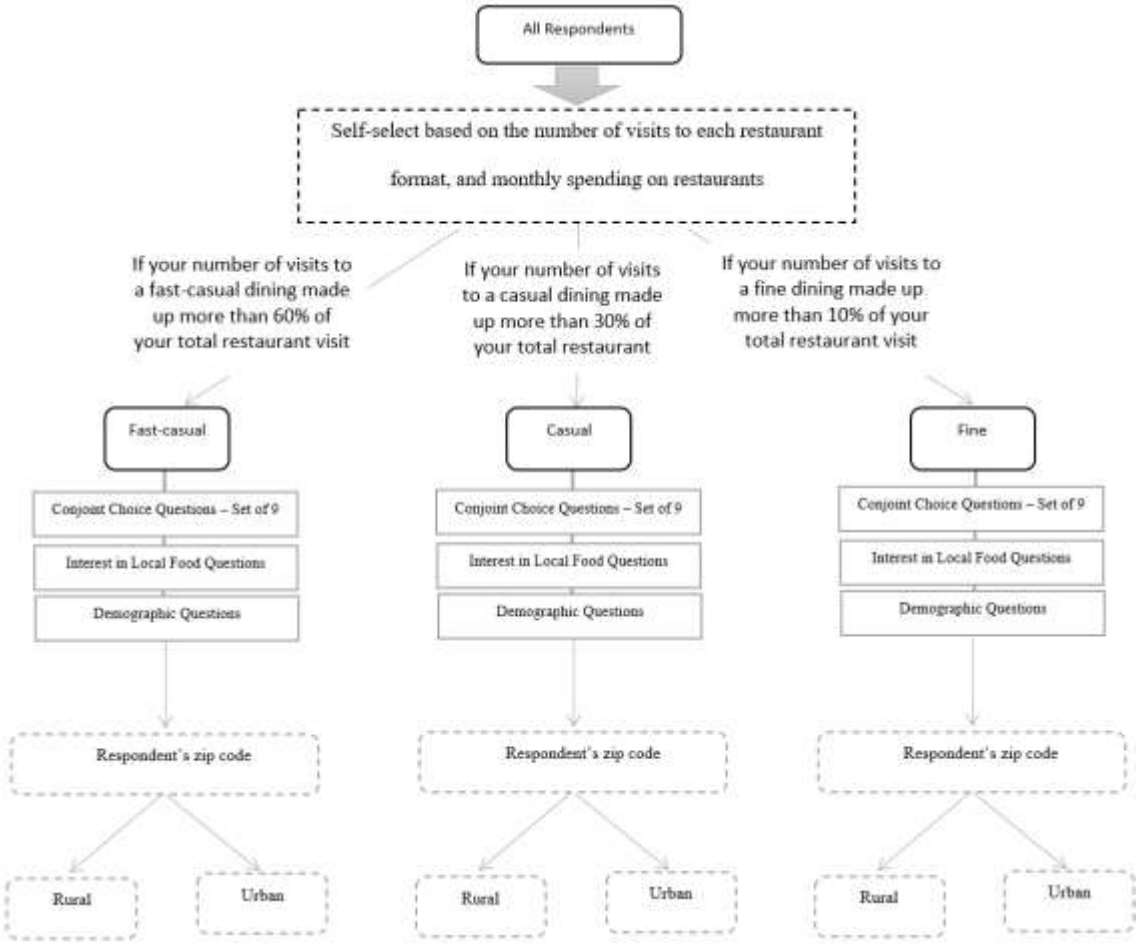


Table 3.1 Departments of Agriculture Local Food Promotion Programs

State	Program Logo
New Hampshire	Farm to Restaurant Connection"*Certified Local* program"
Colorado	Colorado Proud program "on the menue"
Kentucky	Kentucky proud program (Buy Local)
Michigan	Taste the local difference Eat local eat natural
Tennessee	The Pick Tennessee Products Farm and Restaurant Alliance
New Jersey	Jersey Fresh

Table 3.2 Attributes and Their Levels

Attributes		Levels			
Price	Fast-Casual Dining	$14.99	$18.99	$22.99	$26.99
	Casual Dining	$34.99	$38.99	$42.99	$46.99
	Fine Dining	$49.99	$53.99	$57.99	$60.99
Driving Distance		10 min	20 min	30 min	
Investment Level in Locally Sourcing		No local sourcing	some local sourcing	moderate local sourcing	significant local sourcing

Table 3.3 Example of a Choice Set in Fast Casual Dining Restaurant

Attributes	Profile 1	Profile 2	Profile 3
Price	$22.99	$18.99	Neither
Driving Distance	20 min	10 min	
Locally Sourced Ingredients	Moderate Local Sourcing	Not Local	

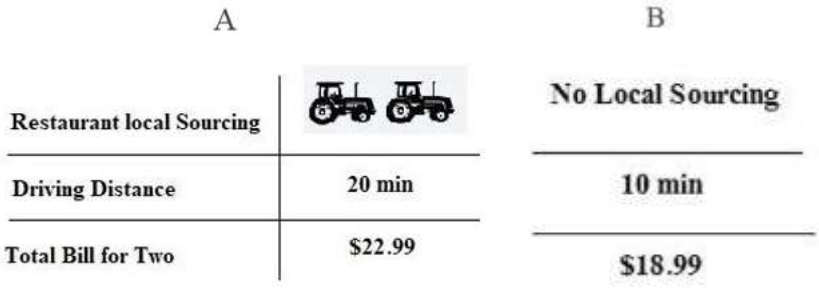


Table 3.4 Demographic characteristics of the representative sample

Variable	Description	Sample Mean/Freq. Fast-Casual Dining		Sample Mean/Freq. Casual Dining		Sample Mean/Freq. Fine Dining	
		Rural	Urban	Rural	Urban	Rural	Urban
Number of respondents		505	638	505	241	149	190
Female (%)	=0 if a respondent is female, and 1 otherwise	73.03	72.41	68.32	68.88	81.88	64.74
White (%)	=1 if a respondent is white, and 1 otherwise	85.15	93.73	87.33	84.65	91.95	79.47
Age (YRS)	A continuous variable representing respondent's age	41.62	45.34	50.28	49.68	44.66	44.37
Education	A continuous variable representing respondent's education in years	13.81	13.28	14.23	14.48	13.89	15.20
Household income	A continuous variable representing respondent's annual income before tax	$51,045	$89,677	$59,873	$64,829	$62,986	$85,868
Monthly spending at restaurants ($)	Categorical Variable	$110.94	$98.66	$135.34	$145.33	$169.12	$217.10
Fast casual dining monthly visit (purchase/past 12 months)	Categorical Variable	3.23	3.98	2.02	2.48	3.52	3.91
Casual dining monthly visit (purchase/past 12 months)	Categorical Variable	1.60	2.19	2.75	3.18	3.25	3.93
Fine dining monthly visit (purchase/past 12 months)	Categorical Variable	0.70	0.98	0.95	1.08	1.81	2.42
Interest in Local food variables (%)	=1 if at least some interest, and 0 otherwise	39.01	43.26	42.77	41.49	59.06	54.21

Table 3.5 Fast-casual dining format statistics for determining optimal number of consumer classes – Rural Setting

Number of classes	Number of observations[13]	Number of parameters (K)	Log likelihood at coverage (LL)	AIC[14]	BIC[15]
2	640	13	-4427.289	8880.578	8981.382
3	640	22	-4269.201	8582.401	8752.993
4	640	31	-4205.111	8472.223	8712.602

Table 3.6 Fast-casual dining format statistics for determining optimal number of consumer classes – Urban Setting

Number of classes	Number of observations[16]	Number of parameters (K)	Log likelihood at coverage (LL)	AIC	BIC
2	505	13	-3507.114	7040.228	7137.992
3	505	22	-3410.51	6865.019	7030.467
4	505	31	-3400.163	6862.237	7095.457

Table 3.7 Casual dining format statistics for determining optimal number of consumer classes – Rural Setting

Number of classes	Number of observations[17]	Number of parameters (K)	Log likelihood at coverage (LL)	AIC	BIC
2	505	13	-3592.739	7211.479	7309.244
3	505	22	-3462.825	6969.65	7135.099
4	505	31	-3426.09	6914.18	71.47.313

[13] Sample size is 17,226 choices from 640 individuals (N)

[14] AIC (Akaike Information Criterion) is calculated using [-2(LL-K)]

[15] BIC (Bozdogan Akaike Information Criterion) is calculated using [-LL+(K/2) x ln(N)]

[16] Sample size is 13,634 choices from 505 individuals (N)

[17] Sample size is 13,634 choices from 505 individuals (N)

Table 3.8 Casual dining format statistics for determining optimal number of consumer classes – Urban Setting

Number of classes	Number of observations[18]	Number of parameters (K)	Log likelihood at coverage (LL)	AIC	BIC
2	241	13	-1678.629	3383.258	3471.406
3	241	22	-1612.582	3269.164	3418.338
4	241	0	-1584.488	3168.976	3168.976

Table 3.9 Fine dining format statistics for determining optimal number of consumer classes – Rural setting

Number of classes	Number of observations[19]	Number of parameters (K)	Log likelihood at coverage (LL)	AIC	BIC
2	149	13	-945.4513	1916.903	1998.8
3	149	22	-909.5665	1863.133	2001.728
4	149	31	-899.0041	1860.008	2055.302

Table 3.10 Fine dining format statistics for determining optimal number of consumer classes – Urban setting

Number of classes	Number of observations[20]	Number of parameters (K)	Log likelihood at coverage (LL)	AIC	BIC
2	190	13	-1307.053	2640.106	2725.163
3	190	22	-1278.196	2600.393	2744.336
4	190	31	-1208.298	2478.597	2681.426

[18] Sample size is 6,507 choices from 241 individuals (N)
[19] Sample size is 4,023 choices from 149 individuals (N)
[20] Sample size is 5,130 choices from 190 individuals (N)

Table 3.11 LCM Parameter Estimates for Four Classes for Fast-Casual Dining Format – Rural Setting

Variable	Class (1)	Class (2)	Class (3)	Class (4)[21]
Choice of Ordering Locally Grown Products in local Restaurants by Consumers				
Local Sourcing	0.57*** (0.031)	0.15*** (0.041)	0.67*** (0.236)	-0.11 (0.194)
Driving Distance	-0.05*** (0.004)	-0.04*** (0.005)	0.003 (0.021)	-0.07*** (0.027)
Price	-0.09*** (0.007)	-0.17*** (0.011)	-0.49*** (0.107)	-0.08** (0.049)
No-Buy	5.26*** (0.278)	3.48*** (0.257)	11.88*** (1.784)	-0.31 (1.240)
Female	-0.12 (0.324)	-0.14 (0.332)	-0.32 (0.386)	----
Age	-0.06*** (0.010)	-0.03*** (0.010)	-0.04*** (0.012)	----
Education	0.15 ** (0.069)	0.06 (0.070)	0.11 (0.088)	----
Income	0.02 *** (0.006)	0.01 (0.006)	0.01* (0.007)	----
Class Share (%)	45	29	13	12

*** significant at 1% , ** significant at 5% , * significant at 10%

[21] Reference group

Table 3.12 LCM Parameter Estimates of Four Classes for Fast-Casual Dining Format – Urban Setting

Variable	Class (1)	Class (2)	Class (3)	Class (4)[22]
Choice of Ordering Locally Grown Products in local Restaurants by Consumers				
Local Sourcing	0.12* (0.069)	0.18*** (0.087)	0.22*** (0.075)	0.84*** (0.101)
Driving Distance	-0.06*** (0.010)	-0.06*** (0.014)	-0.01*** (0.007)	-0.10*** (-0.010)
Price	-0.14*** (0.018)	-0.32*** (0.034)	-0.02 (0.014)	-0.13*** (0.015)
No-Buy	2.00*** (0.431)	9.54*** (0.841)	3.26*** (0.603)	5.03*** (0.402)
Female	0.06 (0.315)	-0.09 (0.359)	0.56 (0.407)	----
Age	0.03*** (0.009)	-0.01 (0.012)	-0.01 (0.012)	----
Education	-0.15 * (0.078)	-0.23*** (0.085)	-0.23*** (0.094)	----
Income	-0.02 *** (0.005)	-0.01 (0.005)	-0.004 (0.005)	----
Class Share (%)	22	18	22	36

*** significant at 1% , ** significant at 5% , * significant at 10%

[22] Reference group

Table 3.13 LCM Parameter Estimates of Two Classes for Casual Dining Format – Rural Setting

Variable	Class (1)	Class (2) [23]
Choice of Ordering Locally Grown Products in local Restaurants by Consumers		
Local Sourcing	0.49*** (0.025)	0.20*** (0.057)
Driving Distance	-0.04*** (0.002)	-0.03*** (0.007)
Price	-0.10*** (0.005)	-0.18*** (0.014)
No-Buy	6.65*** (0.253)	6.59*** (0.599)
Female	-0.20 (0.240)	----
Age	-0.03*** (0.006)	----
Education	0.05*** (0.047)	----
Income	0.009*** (0.003)	----
Class Share (%)	71	29

*** significant at 1% , ** significant at 5% , * significant at 10%

[23] Reference group

Table 3.14 LCM Parameter Estimates of Three Classes for Casual Dining Format –Urban Setting

Variable	Class (1)	Class (2)	Class (3) [24]
Choice of Ordering Locally Grown Products in local Restaurants by Consumers			
Local Sourcing	0.48*** (0.036)	0.01 (0.360)	0.21*** (0.082)
Driving Distance	-0.05*** (0.004)	-0.04 (0.050)	-0.05*** (0.012)
Price	-0.09*** (0.008)	-0.26** (0.128)	-0.20*** (0.024)
No-Buy	6.66*** (0.383)	7.15 (4.85)	8.62*** (1.028)
Female	-0.47 (0.240)	-1.29** (0.602)	----
Age	-0.02** (0.006)	0.02 (0.017)	----
Education	-0.03 (0.047)	-0.23* (0121)	----
Income	0.002 (0.003)	-0.02** (0.009)	----
Class Share (%)	68	11	21

*** significant at 1% , ** significant at 5% , * significant at 10%

[24] Reference group

Table 3.15 LCM Parameter Estimates of Two Classes for Fine Dining Format –Rural Setting

Variable	Class (1)	Class (2) [25]
Choice of Ordering Locally Grown Products in local Restaurants by Consumers		
Local Sourcing	0.01 (0.161)	0.55*** (0.044)
Driving Distance	0.02 (0.021)	-0.03*** (0.005)
Price	-0.15*** (0.038)	-0.09*** (0.010)
No-Buy	5.62*** (2.049)	7.66*** (0.595)
Female	-0.80 (0.546)	---
Age	0.02 (0.014)	---
Education	0.01 (0.100)	---
Income	-0.03*** (0.010)	---
Class Share (%)	25	75

*** significant at 1% , ** significant at 5% , * significant at 10%

[25] Reference group

Table 3.16 LCM Parameter Estimates of Two Classes for Fine Dining Format –Urban Setting

Variable	Class (1)	Class (2) [26]
Choice of Ordering Locally Grown Products in local Restaurants by Consumers		
Local Sourcing	0.08 (0.187)	0.47*** (0.035)
Driving Distance	-0.04** (0.023)	-0.04*** (0.004)
Price	-0.07* (0.041)	-0.07*** (0.008)
No-Buy	5.76*** (2.315)	6.58*** (0.480)
Female	0.22 (0.542)	---
Age	0.03** (0.015)	---
Education	-0.04 (0.097)	---
Income	-0.02*** (0.007)	---
Class Share (%)	14	86

*** significant at 1% , ** significant at 5% , * significant at 10%

[26] Reference group

Table 3.17 Urban Vs. Rural Residents' Willingness to Pay Estimation for Local Food in Alternative Restaurant Formats

	Fast casual				Casual				Fine			
	Rural		Urban		Rural		Urban		Rural		Urban	
WTP	*Local sourcing*	*Driving Distance*	*Local sourcing*	*Driving Distance*	*Local sourcing*	*Driving Distance*	*Local sourcing*	*Driving Distance*	*Local sourcing*	*Driving Distance*	*Local sourcing*	*Driving Distance*
class 1	6.56 (45)[27]	-0.52 (45)	0.90 (22)	-0.43 (22)	4.69 (71)	-0.42 (71)	5.05 (68)	-0.56 (68)	0.06 (25)	0.16 (25)	1.07 (14)	-0.61 (14)
class 2	0.88 (29)	-0.24 (29)	0.54 (18)	-0.17 (18)	1.10 (29)	-0.21 (29)	0.06 (11)	-0.17 (11)	5.78 (75)	-0.40 (75)	5.95 (86)	-0.56 (86)
class 3	1.35 (13)	0.005 (13)	11.26 (22)	0.75 (22)	---	---	1.01 (21)	-0.28 (21)	---	---	---	---
class 4	-1.35 (12)	-0.86 (12)	6.61 (36)	-0.81 (36)	---	---	---	---	---	---	---	---

[27] Numbers in parentheses are class shares

Table 3.18 LCM Parameter Estimates of the Three Classes for Fast-Casual Dining Format – Rural Setting

Variable	Class (1)	Class (2)	Class (3)[28]
Choice of Ordering Locally Grown Products in local Restaurants by Consumers			
Local Sourcing	0. 51*** (0.025)	-0.11 (0.190)	0.14*** (0.040)
Driving Distance	-0.03*** (0.002)	-0.07*** (0.021)	-0.03*** (0.005)
Price	-0.12*** (0.005)	-0.08* (0.046)	-0.17*** (0.010)
No-Buy	-6.01*** (0.237)	0.39 1.205)	-3.59*** (0.252)
Socio-demographic Variables			
Gender	0.09 (0.225)	-0.14 (0.328)	----
Age	-0.033*** (0.007)	0.02* (0.009)	----
Education	-0.14*** (0.052)	-0.04 (0.065)	----
Income	0.0004 (0.0004)	-0.0005 (0.0009)	----
Class Share (%)	58	12	29

*** significant at 1% , ** significant at 5% , * significant at 10%

[28] Reference group

Table 3.19 LCM Parameter Estimates of the Three Classes for Fast-Casual Dining Format – Urban Setting

Variable	Class (1)	Class (2)	Class (3)[29]
Choice of Ordering Locally Grown Products in local Restaurants by Consumers			
Local Sourcing	-0. 36* (0.189)	0.40*** (0.060)	0.42*** (0.025)
Driving Distance	-0.05** (0.023)	-0.08*** (0.008)	-0.04*** (0.003)
Price	-0.10** (0.042)	-0.16*** (0.014)	-0.10*** (0.005)
No-Buy	-0.65 (0.978)	-3.91*** (0.377)	-5.31*** (0.201)
Socio-demographic Variables			
Gender	0.29 (0.348)	0.28 (0.278)	----
Age	0.04*** (0.009)	0.27*** (0.008)	----
Education	-0.12 (0.078)	0.05 (0.063)	----
Income	-0.018*** (0.006)	-0.009** (0.004)	----
Class Share (%)	11	22	64

*** significant at 1% , ** significant at 5% , * significant at 10%

[29] Reference group

Table 3.20 LCM Parameter Estimates of the Three Classes for Casual Dining Format – Rural Setting

Variable	Class (1)	Class (2)	Class (3)[30]
Choice of Ordering Locally Grown Products in local Restaurants by Consumers			
Local Sourcing	0. 49*** (0.026)	-0.22 (0.250)	0.37*** (0.085)
Driving Distance	-0.04*** (0.003)	-0.01 (0.025)	-0.48*** (0.008)
Price	-0.10*** (0.005)	-0.12 (0.097)	-0.19*** (0.023)
No-Buy	-6.91*** (0.291)	-2.47 (3.344)	-7.91*** (1.006)
Socio-demographic Variables			
Gender	0.29 (0.283)	0.69 (0.435)	----
Age	-0.03*** (0.007)	0.02* (0.012)	----
Education	-0.02 (0.054)	-0.16** (0.077)	----
Income	-0.005 (0.003)	-0.013* (0.007)	----
Class Share (%)	64	11	25

*** significant at 1% , ** significant at 5% , * significant at 10%

[30] Reference group

Table 3.21 LCM Parameter Estimates of the Three Classes for Casual Dining Format – Urban Setting

Variable	Class (1)	Class (2)	Class (3)[31]
Choice of Ordering Locally Grown Products in local Restaurants by Consumers			
Local Sourcing	0. 48*** (0.036)	0.01 (0.360)	0.21*** (0.082)
Driving Distance	-0.05*** (0.004)	-0.04 (0.050)	-0.04*** (0.050)
Price	-0.09*** (0.008)	-0.26** (0.128)	-0.20*** (0.024)
No-Buy	-6.66*** (0.383)	-7.15 (4.851)	-8.62*** (1.028)
Socio-demographic Variables			
Gender	0.47 (0.437)	1.29** (0.602)	----
Age	-0.02*** (0.011)	0.02 (0.017)	----
Education	-0.03 (0.086)	-0.23* (0.121)	----
Income	-0.002 (0.004)	-0.02** (0.009)	----
Class Share (%)	68	11	21

*** significant at 1% , ** significant at 5% , * significant at 10%

[31] Reference group

Table 3.22 LCM Parameter Estimates of the Three Classes for Fine Dining Format – Rural Setting

Variable	Class (1)	Class (2)	Class (3)[32]
Choice of Ordering Locally Grown Products in local Restaurants by Consumers			
Local Sourcing	-1.20*** (0.454)	0.56*** (0.046)	0.29** (0.138)
Driving Distance	0.01 (0.042)	-0.03*** (0.005)	-0.01 (0.024)
Price	0.08 (0.084)	-0.09*** (0.010)	-0.17*** (0.046)
No-Buy	7.67 (5.062)	-8.11*** (0.675)	-8.93*** (2.326)
Socio-demographic Variables			
Gender	0.20 (0.828)	-0.54 (0.697)	----
Age	-0.01 (0.023)	-0.005 (0.020)	----
Education	-0.01 (0.151)	0.04 (0.130)	----
Income	-0.027* (0.015)	0.01 (0.010)	----
Class Share (%)	17	71	12

*** significant at 1% , ** significant at 5% , * significant at 10%

[32] Reference group

Table 3.23 LCM Parameter Estimates of the Three Classes for Fine Dining Format – Urban Setting

Variable	Class (1)	Class (2)	Class (3)[33]
Choice of Ordering Locally Grown Products in local Restaurants by Consumers			
Local Sourcing	-0. 15 (0.229)	0.94*** (0.162)	0.36*** (0.086)
Driving Distance	-0.02 (0.028)	-0.04*** (0.014)	-0.04*** (0.005)
Price	-0.06 (0.058)	-0.14*** (0.029)	-0.06*** (0.009)
No-Buy	-1.53 (3.309)	-8.33*** (1.454)	-6.61*** (0.572)
Socio-demographic Variables			
Gender	-0.61 (0.725)	-19.73 (0.1118)	----
Age	0.03** (0.017)	0.02 (0.024)	----
Education	-0.01 (0.122)	0.35* (0.181)	----
Income	-0.02*** (0.008)	-0.02*** (0.008)	----
Class Share (%)	12	22	65

*** significant at 1% , ** significant at 5% , * significant at 10%

[33] Reference group

Table 3.24 Urban Vs. Rural Residents' Willingness to Pay Estimation for Local Food in Alternative Restaurant Formats

	Fast casual				Casual				Fine			
	Rural		Urban		Rural		Urban		Rural		Urban	
WTP	*Local sourcing*	*Driving Distance*	*Local sourcing*	*Driving Distance*	*Local sourcing*	*Driving Distance*	*Local sourcing*	*Driving Distance*	*Local sourcing*	*Driving Distance*	*Local sourcing*	*Driving Distance*
class 1	4.07 (58)[34]	-0.30 (58)	-3.77 (11)	-0.52 (11)	4.91 (64)	-0.44 (64)	5.05 (68)	-0.56 (68)	14.37 (17)	-0.21 (17)	-2.37 (12)	-0.38 (12)
class 2	-1.37 (12)	-0.90 (12)	2.45 (22)	-0.49 (22)	-1.80 (11)	-0.13 (11)	0.06 (11)	-0.17 (11)	5.98 (71)	-0.39 (71)	6.35 (22)	-0.29 (22)
class 3	0.86 (29)	-0.22 (29)	3.99 (64)	-0.44 (64)	1.92 (25)	-0.24 (25)	1.01 (21)	-0.28 (21)	1.64 (12)	-0.08 (12)	5.51 (65)	-0.69 (65)

[34] Numbers in parentheses are class shares

CHAPTER 4. LOCAL FOOD PURCHASING FREQUENCY BY LOCAVORES ACROSS MARKET CHANNELS - IMPLICATIONS FOR LOCAL FOOD SYSTEM DEVELOPMENT

4.1. Introduction

Previous chapters focused on consumers' willingness-to-pay (WTP) for local food across alternative dining formats as a market channel for local food in the state of Kentucky. In this chapter, we aim to expand our knowledge on consumers' purchase behavior from various local food market channels, including farmers' markets, grocers, and restaurants. The main objective of this chapter is to compare local food purchase frequency across market channels, and between the consumers in the state of Kentucky and in the U.S. The rest of this section provides more information on the relative size and characteristics of local food market channels and shows the implication of this study for public investment in local food by the Kentucky Department of Agriculture.

The word "locavore" is a recently admitted word to the Oxford American Dictionary in 2007 and refers to people who have a preference for locally grown products sourced within minimal miles (Memery et al., 2015). This addition is a remarkable indication of consumers' growing interest in local food. Data from a proprietary 'Packaged Facts National Consumer Shopping Survey' for Local Foods in the U.S. published in November 2014 shows that 53% of the 2,271 adult respondents are locavores. According to Packaged Facts, 60% of the respondents stated that their main reason to purchase local food is freshness, while more than half (52%) of the

consumers indicated that they buy local products to support local businesses (Packaged Facts, 2014).

Studies identified several factors for local food popularity. For example, quality (King, 2007) and lower prices (Brown, 2002, 2003) are among other reasons for local food purchase. However, consumers' purchase of local food is not only associated with food attributes but also consumers' shopping behavior and personal characteristics (Mirosa & Lawson, 2012). Yet, distinguishing products quality is challenging for consumers because of a wide range of products available in the market. This issue is more obvious in the case of the 'local' attribute of products because 'locally grown' is generally unknown and subjective. 'Branding' could be a solution to signal consumers about the quality and characteristics of the products (Campbell et al., 2010). However, this is more difficult in the case of 'local food' because of the lack of standard evaluation in the growing and processing of these products. Accordingly, state branding (Figure 4.1) for local food could provide a unified specification of 'local' and interact with consumers' product choices and perceptions by differentiating local food produced within the state (Naasz et al., 2018).

Consumers' confidence in the authenticity of local products provided by state brands is the reason for motivating them to purchase local products with a state brand logo. In a survey from Coloradan locavores in 2018, consumers stated that they value local products with the "Colorado Proud" logo because the label indicates information, which assures the consumers about the 'local' credence of the product (Naasz et al., 2018). State branding for local food provides a standard definition of

‘local’ for consumers by requiring producers to follow some guidelines to be qualified for their logo; therefore, they gain consumers’ trust.

Most of these programs are funded publicly and managed by each state’s Department of Agriculture (Onken and Bernard, 2010). In Kentucky, ‘Kentucky Proud’ (Figure 4.2) is the state brand funded by the Kentucky Agricultural Department. Their main goal is to promote locally grown, or processed products in Kentucky and raise consumers’ awareness about the economic importance of supporting local products. Kentucky Proud represents a broad range of local products including foods, nursery items, crafts, agritourism sites, farmers' markets, state parks, and many other products. In 2016, the Kentucky Department of Agriculture conducted a survey on consumers, stores, restaurants, and grocers to understand consumers’ familiarity with the ‘Kentucky Proud’ brand. According to the results of this report, although the difference between the ‘locally grown’ and ‘Kentucky Proud’ brand is not always clear to consumers, 69% of the respondents stated that they are familiar with the ‘KY Proud’ logo and 58% indicated that they understand this brand. Moreover, 50% of the respondents purchase products with the ‘KY Proud’ logo for reasons including quality, taste, and freshness (Think New, 2016).

Considering the competitiveness of today’s food market, understanding consumers’ preferences and familiarity with local food is an important factor in the success of state branding programs. Branding could promote consumers’ ‘patriotism’ toward local and regional food (Angowski & Jarosz-Angowska, 2019). Factors like ‘farmers’ market visits within a previous year’, ‘numbers of meals per week prepared at home’ and ‘education’ are effective on consumers’ awareness of the ‘KY Proud’

brand in Kentucky. While, ‘age’, ‘number of home meals’, ‘years of local shopping’ and ‘primary cook’ are effective on consumers’ purchase frequency of KY Proud products (Zare & Woods, 2015).

While these results are significant, consumers’ purchase of local food from direct and intermediate local markets is different. Local foods are distributed through different direct and intermediate market channels, including farmers’ markets, local restaurants, and mainstream retailers, which, in total, account for about $4.8 billion of local food sales in 2008 (Meas et al., 2015). According to the USDA’s Agricultural Marketing Service, these channels have expanded significantly from 1994 to 2008 (Adams & Salois, 2010). For example, the number of farmers markets in the United States has grown rapidly in recent years to more than 8,600 markets currently registered in the USDA. Also, the results of the consumer survey by Package Facts in 2015 suggest that the number of consumers who buy local products from supermarkets/grocery stores is two out of three. Therefore, mainstream retailers, local and regional grocers and multi-regional retailers like Kroger, Meijer, and Whole Foods are trying to add more local products, highlight them and give them priority in their stores to answer the demand from a shift in customers’ preferences in buying local products (Package Facts, 2015).

Despite the work on consumers’ purchase frequency, it is unclear how local food purchase frequency changes across market channels, where local foods are typically distributed. Our study aims to determine how consumers’ preferences for local food, together with other demographic variables, explains the frequency of local products purchased in each of three market channels – farmers markets, restaurants,

and grocery. Moreover, we are providing additional insight into the effectiveness of the Kentucky Proud promotion program. We also present a comparison between Kentucky State and the U.S. since there is a heterogeneous distribution of local food promotion programs in different states and across the country. We believe such a comparison will help us to communicate with policy-makers, farmers, and the State Departments of Agriculture on how each state's local food market is different from others.

4.2. Background

Interest in 'locally grown' products has been investigated in several surveys. The results suggest consumers' growing preference for local food. A national survey conducted in 2006 asked the respondents about their purchase frequency of local food. About four out of five respondents stated that they purchase local food either occasionally or always (Keelingbond et al., 2009). Another survey by the National Restaurant Association (NRA) shows that customers are concerned about the origin of their food. NRA's 'Culinary Forecast' report in 2014 suggests 'locally sourced meats and seafood', 'locally grown products', and 'environmental sustainability' were among the top trending concepts. The same report found 'hyper-local', 'locally sourced meat and seafood', 'locally sourced produce', and 'farm/estate branded items' are among the top menu trends for 2018 (National Restaurant Association, 2015, 2018). Evidence suggests the 'Environmental' movement (Martinez et al., 2010) and the 'Slow Food' movement (Gaytan, 2003) have driven consumers' interest in local food in the U.S.

The term "local" has been defined variously, where generally, based on USDA definition "local food" refers to foods produced and sold within a certain geographical

area (Kumar & Smith, 2018). However, “area” could attribute to a specific distance from the origin, a state borderline, or a geographic district (Kumar & Smith, 2018). Consumers may use other characteristics to define “local food,” including environmentally friendly production methods, fair farm labor practices, or animal welfare (Martinez et al., 2010). In this study, we define “local food” as foods grown, produced, and sold within the boundaries of the state.

Local food is distributed through different market channels. Whether the transactions between consumers and farmers are conducted directly or indirectly, market channels could be direct-to-consumers (e.g., farmers’ markets), or direct to retail/foodservice (e.g., sales by farmers to restaurants, retail stores, and institutions such as government entities, hospitals, and schools) (Martinez et al., 2010). In 2008 most of the local food (about 50 to 66 percent) are sold through intermediated channels rather than farmers’ markets (Low & Vogel, 2011). Giant supermarkets like whole foods have promoted local food in their stores to answer the increasing demand of consumers (Kumar & Smith, 2018). For example, Whole Foods leads the market in offering a wide range of local products in its stores as well as financing independent producers (Whole Foods, 2014). This trend is ascending, especially with supercenters continuing to promote local food by allocating special aisles in their stores (Smith, 2009). However, farmers’ markets also experienced a 123-percent increase in the U.S. from 2004 to 2014 (Kumar & Smith, 2018), where, according to the USDA Agricultural Marketing Service’s 2006 National Farmers’ Market Survey, the most popular product sold in these markets were fresh fruits and vegetables (Ragland & Tropp, 2009). These trends, along with the

national consumers' surveys show that consumers' behavior with regards to local food has changed (Zepeda & Li, 2006).

Serirat et al. explained consumers' behavior includes individuals' act of purchasing essential goods and services, which requires being involved in the process of decision making and includes transactions between consumers and sellers (Serirat et al., 2000). Conducting and implementing marketing strategies involve understanding and analyzing the purchasing pattern of consumers (Wongleedee, 2015).

To this aim, studies found consumers' number of visits to farmers' market is associated with the market locations, facilities, and employee attitude (Govindasamy et al., 1997; Lehman et al., 1998; Keeling-Bond et al., 2009). Another study by McGarry Wolf et al. (2005) found that having a member of the household to cook has a positive effect on visits to farmers' markets.

Consumers' characteristics are other effective factors in their purchase of local food. Studies show age (Onianwa et al., 2006; Wixson et al., 2011), education (Onianwa et al., 2006; McGarry Wolf et al., 2005), income (Jekanowski et al., 2000; Wixson et al., 2011), and gender (Brown, 2002) can explain consumers' preferences for local food. For example, Onianwa et al. (2006) examined the characteristics of local food consumers in Alabama by collecting 222 observations from farmers' markets. The results of the study show that the average age of local food buyers is 41 years old, with 72 percent of them being female, and almost 50 percent of the respondents were white. The majority of the consumers were educated (60% above high school), and 70 percent were married. Another study by McGarry Wolf et al. in 2005 investigated 336 local food consumers in

San Luis Obispo County, California, to understand differences in consumers' characteristics who purchase local food from farmers' markets vs. supermarkets. Their results show that farmers' markets shoppers and supermarket shoppers indicated similar age levels (around 51 years old), income levels (more than $40,000), and employment status. They were mostly married females with completed post-graduate education. However, supermarket consumers stated that they prefer shopping from supermarkets because it is more convenient.

On the other hand, Wixson et al. (2011) collected data from 1013 individuals in Kentucky and Ohio states to evaluate consumers' general local food purchasing behavior. Their results suggest age, household income, having a bachelor's degree, urban residency have a positive relationship with the purchase frequency of local food.

Local food promotion programs have been initiated in several leading retailers and food service establishments such as restaurants (Martinez et al., 2010). According to Packaged Facts (2007), 87 percent of fine dining establishments added local food to their menus to respond to their customers' demand. Local foods also have found their way to nearly 30 percent of quick service operators (National Restaurant Association, 2009). Racine et al. (2013) conducted a cross-sectional analysis using data from the 2008 North Carolina Child Health Assessment and Monitoring Program (NC CHAMP) to understand individuals' characteristics affecting on local food purchase. The results show that almost half of their respondents were female and stated they purchased local food on average once a month in the last year. They also found that white families have higher preferences to buy local. Their adjusted results, however, provide mixed evidence on the relationship between consumers' socio-demographic factors and their purchase frequency of local

food. The authors found lower income, rural residency, and households with children in poor health are more likely to purchase local food.

Although these findings need to be interpreted in their own context, they still provide some evidence on the growing consumers' demand and interest in local food. As mentioned above, previous literature has examined the effect of socio-demographic factors on the consumers' purchase frequency of local food in various samples. However, consumers' purchase behavior across local food market channels is still uninvestigated.

To this effort, we aim to identify the factors that define consumers' behavior and frequency of purchasing of local products and provide a comparison of local food purchase patterns across market channels between KY and the U.S. Another contribution of this research is to investigate consumers' frequency of purchase of local food across different groups based on their preferences for local food. More specifically, we categorized consumers into three groups considering their responses to a question in our survey asking about the respondents' importance of local food to their consumer choices. Following Woods et al. (2013), we adopted the "PERIPHERY group", "MID-LEVEL group", and "CORE group" classification. These consumers' groups are explained in the survey section.

4.3. Survey and Data

We use data collected from customers' feedbacks through two surveys. The first one was conducted on a sample of the U.S. food consumer population with 682 respondents in 2015. The second survey collected identical data from local food consumers in the state of Kentucky with 1987 responses between December 2019 and

January 2020. This study examines customer preference toward local food purchase by using alternative questions on the survey ranging from "not at all important" to "very important" (i.e. five-point Likert-type questions) along with other questions that measure the number of times customers purchased local food within the last 12 months. Specifically, we asked the respondents about their purchase frequency from three different local food market channels including farmers' markets, grocers, and restaurants (Figure 4.3). Specifically, there were four possible responses to the question "How many times did you purchase a local product at a farmers' market within the last 12 months?".The same question was asked for local food purchase from a grocery store and/or a restaurant.

The respondents' answer to these questions determined the observed dependent variable "Frequency of Purchase". The options were "None", "1-5 times", "6-10 times", and "11 or more times" (See Table 4.6 for a summary of zero responses). For example, choosing the option "1-5 times" for farmers' market purchase could mean that the respondent purchased local food 1 to 5 times at the farmers' market within the last 12 months. Income is a categorical variable in the survey. The respondents were asked to indicate their annual household income before taxes. The offered categories are 'Less than $25,000', '$25,000 to $39,999', '$40,000 to $59,999', '$60,000 to $79,999', ' $80,000 to $99,999', '$100,000 to $119,999', '$120,000 to $139,999', '$140,000 to $159,999', and '$160,000 or more'. In the process of cleaning the data, we considered mid-points (15, 32, 50, 80, 110, 130, 150, 170, and 300) to estimate the model.

The survey asked the respondents about the option that best describes their level of education. The choices are as following 'Less than 9th grade', 'Some high school',

‘High school graduate or equivalent’, ‘ Some college’, ‘Associate degree’, ‘Bachelor's degree’, ‘Graduate or professional degree’, and ‘Prefer not to answer’. In the regression model, we transformed the responses to the number of years of education and considered the following mid-points 10, 12, 14, 16, 18. Residency in the model is defined as three groups including Urban, Suburban, and Rural. The survey asked the respondent directly that “Which of the following best describes where you currently live?” The respondents could choose among the following options including ‘Larger City (Lexington, Louisville, Northern Kentucky)’, ‘Suburban area outside larger city Smaller city (i.e. Elizabethtown, Bowling Green, Pikeville, etc.)’, ‘Rural (but not a farming community)’, ‘A farming community’. We then categorized Rural and Farming communities as ‘Rural’.

In order to classify the consumers into different local sourcing preferences groups, we asked them “How important is local food to your consumer choices?” Based on their responses, we categorized them as "PERIPHERY", “MID-LEVEL”, and “CORE” customers. To “PERIPHERY group” purchasing of local food is “not at all important”, ‘slightly important”, or “neutral”, where to “MID-LEVEL” group of consumers includes those who indicated that local food is “important” to them. Lastly, to “core group” local food is “very important”. A comparison between national shoppers and Kentucky shoppers is represented in Table 4.1. Local food importance criteria show in the national sample 278 respondents (46%) corresponding to the PERIPHERY group, 234 respondents (38%) to the MID-LEVEL, and 100 respondents (16%) to the CORE group. Based on the estimated t-test, unpaired, unequal variances (p-value equals 0.0001, so we reject the null hypothesis stating that mean local food importance in the U.S is equal to the mean local food importance in Kentucky), these statistics are slightly different for the

Kentucky sample, where 55.6% of the respondents fitted in the PERIPHERY group, 31.2% in the MID-LEVEL, and 13.1% in the CORE group.

Other independent variables in our model are socio-demographic characteristics of local food buyers, including gender, education, age, and income. Table 4.2 presents descriptive statistics of the variables in the model.

4.1.1 Empirical Model

The censored regression model or the Tobit model was selected to infer predictor variables effects on purchase frequency of local food across different market channels, while classifying potential buyers into different levels range from most PERIPHERY, to MID-LEVEL and CORE, based on the local food importance for them. The Tobit model allows for censoring the information we have above zero. In the case of this survey, the response variable "Frequency of Purchase" is censored because of the non-zero response options to the questions. In our survey, locavores purchase 0, 3, 8, and 15 values of local food from various market channels, including farmers' markets, grocers, and restaurants. Therefore, the Tobit model suggested by Tobin (1958) is preferred since it considers the values above 0 and supposes that there is a latent or unobservable variable Y_i that depends on the response variable X_i. The estimated parameter β determines the relationship between the latent variable and the independent variables (Abede et al., 2010).

Three Tobit models were estimated to understand how different customer preferences along with demographic variables (gender, age, education, income, and type of residency) explain changes in purchase from the farmers' market, grocers, and local

restaurants. We defined the customer preference by j, where j=1 for "CORE" customer and j=2 for the "MID-LEVEL" customer. The non-observable underlying utility function which ranks the preference of the i^{th} customer is given by U (M_{ji}, A_j).

Where M is the vector of customer and customer-specific attributes (e.g., gender, age, education, income, type of residency, and years lived in current area) and A is the vector of the different customers' preferences. The functional form of our model is specified with a Tobit model, where μ_i is i.i.d with zero mean and constant variance σ^2:

$$Y_i = X_i\beta + \mu_i \quad \text{if } i^* = X_i\beta + \mu_i > T \quad \text{and} \quad \mu_i \sim (0, \sigma^2)$$

$$= 0 \quad \text{if } i^* = X_i\beta + \mu_i < T \quad \text{and} \quad \mu_i \sim (0, \sigma^2)$$

Where Yi is the predicted value of local food purchase, i* is a non-observable latent variable, and T is a non-observed threshold level. The Tobit model (Tobin, 1958) therefore measures the extent to which the independent variables help explain variation in the purchase frequency.

4.4 Results

Table 4.2 shows the average age in the national sample is 47.40 years old, while in the Kentucky sample average of this variable is 45.51, which suggests a younger sample relative to the national data. Age is a continuous variable in our survey.

Table 4.3 shows purchase frequency across markets based on income level. In the Kentucky sample, 40.06% of consumers made $50,000-99,000. In the national sample, the same income category belongs to 29.09% of respondents. However, as expected, the average income level in the national sample ($73,970) is well above the average income

level in the Kentucky data ($57,920). Income distribution across market channels is interesting. Overall, national shoppers purchase frequency of local food from farmers' markets and grocers is higher rather than the Kentucky sample. In the Kentucky sample, individuals with an income level of $100,000 or higher, indicated higher number of visits (4.23) to a restaurant as a sourcing channel of local food. While the Kentuckian respondents who made $20,000 or lower (26.87% of the Kentucky sample) prefer purchasing local foods from grocers. However, in both samples, customers with the highest average income have the highest average purchase frequency of local food from grocers.

Relative to the national sample, the percentages of females are higher in the Kentucky sample. 71.51% of the Kentucky sample are female, who prefer to purchase their local food from grocers rather than other market channels. In the national sample, 51.80% are female, and similar to the Kentucky sample, they purchase their local food from grocers the most (Table 4.4). Moreover, the result of the unpaired t-test between gender in KY and gender in the U.S. sample shows there is a significant difference (p-value = 0.000 is significant at 5%) between means of these two variables in KY and the U.S. surveys.

In the Kentucky sample, 37.49% of respondents had some college education or trade/technical certification, while in the national data, 38.40% of them had a college degree. Distribution of the respondents' education across market channels (Table 4.5) shows shopping from grocers is the most preferred local food sourcing channel in both samples. The Kentuckian shoppers with a college degree and a postgraduate degree had a higher purchase frequency of local food from restaurants rather than respondents in the

national sample. On the other hand, Kentuckian with some high school or a high school degree shop more frequently from grocers rather than national shoppers.

Table 4.6 provides information on purchase frequency by category across different market channels for Kentucky and the US. Most of the respondents in the national and Kentucky sample stated that they purchased one to five times from farmers' markets and restaurants in the past 12 months. However, in National data, respondents stated they purchased local food from grocers more than 11 times in the past 12 months. Also, 47.74% of Kentuckian locavores purchase 1 to 5 times at farmers' markets, and 47.45% from restaurants (Table 4.7).

Most of the respondents in the national and Kentucky surveys were indicated residing in urban and suburban settings. Estimated statistics for the residency variable across the market show that rural, urban, and suburban shoppers in the U.S. purchase from farmers' markets and grocers more than Kentuckian locavores. However, Kentuckian locavores stated a higher number of local food purchase at restaurants. In the national survey, urban shoppers indicated a higher frequency of purchase from farmers' markets. However, in the Kentucky sample, urban and suburban locavores are inclined to purchase more at grocers and restaurants.

4.4.1 Tobit Model Results

The results of the Tobit regressions show there are differences across the PERIPHERY, MID-LEVEL, and CORE groups regarding local food purchase from various market channels (Table 4.8). In all three models, there are positive and significant relationships between customer preferences groups and purchase frequency local food

relative to the reference group, the PERIPHERY group of consumers. In other words, CORE and MID-LEVEL contribute significantly to each channel explaining correlation. That is, the MID-LEVEL and CORE groups have a higher local food purchase than the PERIPHERY group. This is true for both national and Kentucky samples.

As expected, income is positively associated with local food purchase frequency across all markets in both samples, implying higher income consumers are more likely to purchase local food from different market channels. The education variable is statistically significant only in farmers' markets and restaurant regressions for the Kentucky sample. Therefore, we conclude that education is correlated with Kentuckians shopping at farmers' markets and restaurants, meaning higher educated Kentuckian consumers are more likely to purchase local food from farmers' markets and restaurants. The estimated coefficient for 'male' is significant and negative for farmers' markets regression in the national sample, and grocers' regression for the Kentucky sample, indicating male shoppers in the national survey are less likely to purchase local food from farmers' market. Likewise, male locavores in Kentucky are less likely to purchase local food from grocers relative to female shoppers.

'Age' is statistically significant and positive only in the farmers' markets regression in Kentucky, implying that younger Kentuckian consumers are more likely to purchase local food from restaurants and grocers.

Considering Age, and Income distribution in KY and U.S. survey (Figures 4.4 - 4.7) we expected Age and Income to show a non-linear relationship to consumers' purchase frequency. This is normally modeled by including age squared and income squared as independent variables in the model. Results show Income-squared is

statistically significant and negatively associated with the purchase frequency, meaning the variable is increasing in a diminishing rate.

Urban proximity is positively related to local food purchase frequency at grocers in Kentucky data, meaning Kentuckian locavores in an urban setting are more likely to purchase local food from grocers. However, in the national survey, the 'urban' variable is negatively associated with the frequency of purchase in restaurants regression, implying that national locavores in an urban setting have a lower purchase frequency of local food at restaurants. On the other hand, the estimated coefficient for the 'suburban' variable is statistically significant and positive in grocers and restaurant regressions, but only in the Kentucky sample, indicating that Kentuckian shoppers in the suburban setting are positively correlated with purchase frequency of local food at grocers and restaurants.

In conclusion, in the Kentucky survey, the purchase frequency of consumers from restaurants (4.08) is higher than the national survey (Table 4.6). In the national sample, 37.75% of respondents purchase more than 6 times from farmers' markets (Table 4.6). In addition, the average purchase frequency of national locavores in the farmers' market (5.02) and grocers (7.23) is well above the Kentuckian shoppers (Table 4.7). Summary of consumers characteristics (Table 4.8) show in the Kentucky sample, older, higher income, higher educated consumers purchase more from farmers' markets. However, female Kentuckian locavores in urban and suburban settings with higher income purchase local food more from grocers. Lastly, local food purchase from restaurants is higher for consumers with higher income and education residing in a suburban area in Kentucky. On the other hand, in the national survey, female locavores with higher income have higher purchase frequency from farmers' markets. National consumers with higher

income residing in a rural setting have higher local food purchase frequency from restaurants. Reported Pseudo R^2 is low for all models. The reason might be the use of mid-points for the dependent variable (i.e., purchase frequency), which was transformed from a categorical variable to a quasi-continuous variable for easier interpretation of the coefficients. However, using mid-point in our estimation might lead to observations, which are not representing our sample. Therefore, in our future expansion of this study, we will present the estimated coefficients of OLS and Ordered Logit models for comparison.

4.5 Conclusions and Implications

This study is a contribution to the determinants of local food frequency of purchase and has provided new knowledge to a comparison across local food marketing channels including farmers' markets, grocers, and restaurants. There are qualitative differences between direct (farmers' markets) and intermediate markets (grocers and restaurants). Consumers' experience of local food in farmers' market is different than shopping local food at grocers or local sourcing from restaurants as consumers in direct markets of local food are more engage in a relationship with farmers, talking to vendors, and gaining a sense of loyalty. However, none of these is a case when local sourcing from grocers or restaurants.

We estimated three different Tobit models to determine the effect of customer preferences, together with other demographic variables, on the frequency of local food purchase in each market channel – farmers markets, restaurants, and grocery. This study also provides a comparison between two surveys conducted from national and Kentuckian consumers. It is revealed that, compared to the PERIPHERY group, the

CORE and MID-LEVEL groups of consumers have a higher frequency of purchase across all markets in both surveys. However, factors contributing to local food purchase frequency appear to be different across market channels in each survey. In addition, lower income consumers are not concerned about purchasing local food. In this survey, we did not find any high correlation between some variables like 'urban' and some market channels in the national or Kentucky sample.

Our results show that passionate locavores who include a small share of the market are loyal customers of farmers' market rather than grocers or restaurants. Yet, our data shows a large share of the market is not concerned about sourcing their local food from the farmers' market, grocers, or restaurants. To this group of consumers, local food is 'important', 'neutral', 'slightly or not at all' important. Our evidence suggests there is a lot of local food purchase activities that take place beyond the CORE group of consumers by MIDLEVEL and PERIPHERY groups. These last two groups are important across all channels as they include a significantly higher share of the market. Therefore, we suggest that local food purchases from MIDLEVEL and PERIPHERY should not be ignored as a majority of local food purchases are made by these groups. Grocers and restaurants known as intermediated markets are considerable markets for farmers to grow their sales and could not be ignored. As explained above, these markets play an important role in consumers' local sourcing since the majority of local food purchases occurs in intermediated markets. Although there are numbers of other direct markets such as Community Supported Agriculture (CSA) and Farm to School programs, which we do not provide statistics for them in this study; however, we have enough evidence to suggest a higher number of local food purchase frequency from intermediated markets

rather than direct market. These findings are consistent with previous literature, such as Low and Vogel's study. Therefore, the importance of intermediated markets in local food purchases should not be ignored.

These results have significant marketing implications for State Departments of Agriculture, farmers selling locally as well as local food retailers. Especially for the Kentucky Department of Agriculture, comparison between Kentuckian and national locavores could provide insight on expanding their base local food promotion programs to increase local food purchase. Furthermore, this information suggests a basis for assessing local food promotion programs, which, eventually, incorporate to the success of these programs. Evaluation of the impact of the promotion programs provides a measurement to show funders and participating stakeholder how their successful investments are over time. Therefore, the results of this study suggest impact estimates to local policymakers in order to determine the most cost-effective type of local food system interventions.

For farmers and retailers in this sector, our results provide information on potential market segments and a group of consumers with a higher purchase frequency of local food. For example, our estimations show in Kentucky, females with higher income residing in urban or suburban areas purchase local food from farmers' markets. This information is valuable for farmers, who sell their products in local markets. On the other hand, national consumers in rural areas purchase their local food at restaurants, which shows a potential market segment for restaurant owners in this sector to target those consumers.

Presenting estimated relationships between consumers' interest for local food across different market channels could encourage economic development through empowering the local community, farm viability, consumer fresh food access, shorter supply chains, the emergence of new businesses and financial institutions. These results could serve as a tool for community planners and stakeholders to assess their value adding development strategies. As mentioned above, such an evaluation could provide valuable data and enables the government to apply greater leverage over local policy decisions.

Our findings contributed to the three main areas in local food studies. Demographic characteristics of the respondents in both samples and their average purchasing frequencies are comparable with findings of many studies including Brown (2003), Wixson et al. (2011), Racine et al. (2013), Brooker and Eastwood (1989), Eastwood (1996), Eastwood et al. (1999), and Govindasamy et al. (1998), which indicated female, older, more educated, and higher income consumers are positively linked to higher frequency purchase of local food. Furthermore, the finding also concurred with that of Packaged Facts (2007), Starr et al. (2003), and Guptill and Wikens (2002), which showed increasing trends of consumers purchase of local food from farmers' markets, grocers, and restaurants. Finally, the innovative contribution of this study is classifying consumers into PERIPHERY, MID-LEVEL, and CORE groups based on the intensity of their preferences for local food. To the best of our knowledge, this study is the first and the only one that examines the determinants of local food purchase for various groups of consumers across local food market channels. We tried to provide empirical evidence of consumers' preferences for local food, and its association with

local food purchase as well as the characteristics profile of each group of consumers across different market channels to assist institutions and agents involved in the local food value chain to evaluate their strategies and enhance their businesses and shares.

One of the challenges of regression analysis is multicollinearity, which could be avoided by collecting a larger sample. We have a decent number of observations from Kentucky consumers; however, we need more observations from national consumers to be confident about comparing the national and Kentucky samples. Another issue to notice is the 'endogeneity'. In the proposed model, a higher level of importance for local food may drive a higher purchase frequency of local food. Alternatively, an unobserved variable may jointly determine both high levels of importance for local food and purchase frequency from different market channels, which, if not addressed could lead to misleading results. A direction for our future research is to implement a wo-step OLS model using an instrumental variable (IV) to control for the endogeneity bias.

Furthermore, the average income variable in the national survey is well higher than Kentucky data, suggesting our sample might not adequately represent purchases by lower-income consumer group. Another limitation of this study is the occurrence of the Covid-19 outbreak in October 2019. The pandemic has influenced consumers' preferences and purchase frequency of local food. According to an article by Thilmany et al. on March 21, 2020 published on the National Sustainable Agriculture Coalition website, we have experienced a significant decline in sales across local food markets. With the new policy of social distancing and closing institutions operations, especially restaurant operations, 20% losses in annual sales are anticipated. Therefore, in order to obtain more accurate results, it is important to conduct future research with an updated

response from national and Kentucky locavores and compare their responses pre and after the pandemic.

Figure 4.1 Selected State Branding Programs Logos

Source: Naasz et al., (2018)

Figure 4.2 Selected State Branding Programs Logos

Source: Kentucky Proud Website

Figure 4.3 Purchase Frequency Questions in the Survey

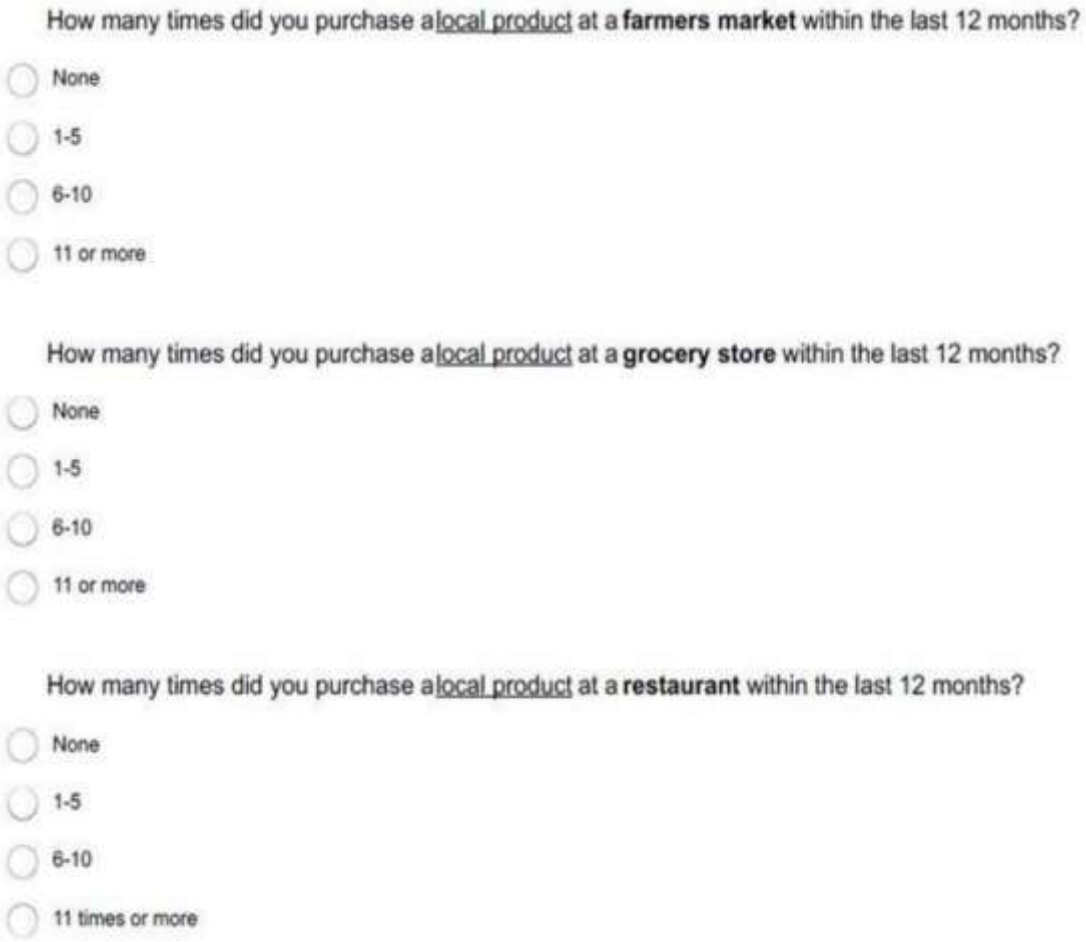


Figure 4.4 U. S Income Distribution

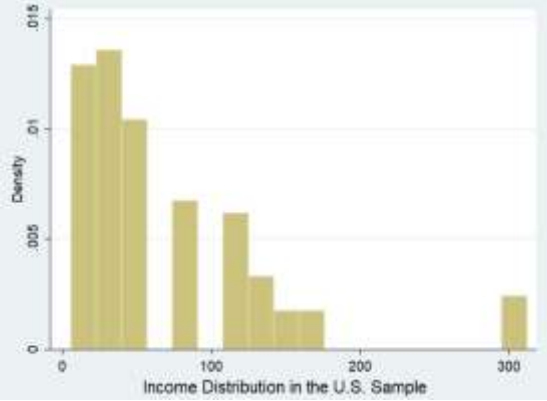


Figure 4.5 KY Income Distribution

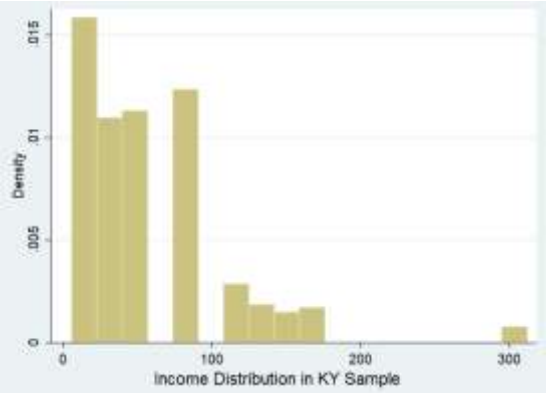


Figure 4.6 U.S. Age Distribution

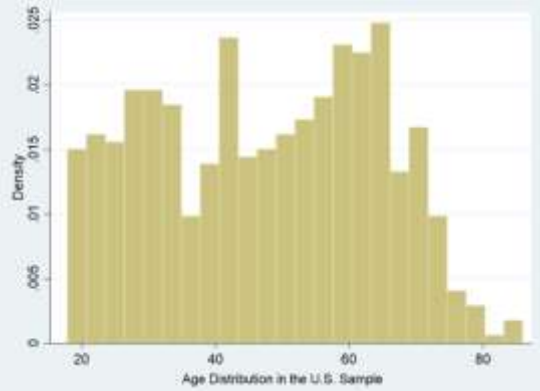


Figure4.7 KY Age Distribution

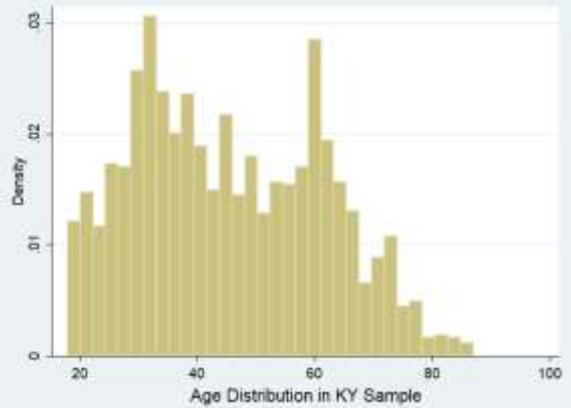


Table 4.1 Consumer Groups

Importance of Local Food Purchase				
	KY		U.S.	
	Customer Groups (All Markets)	Avg.12.mo.Purchase (All Markets)	Customer Groups (All Markets)	Avg.12.mo.Purchase (All Markets)
"Not at all", "Slightly important", "Neutral"	PERIPHERY (55.6%)	11.09	PERIPHERY (45.4%)	11.45
Moderately important	MID-LEVEL (31.2%)	18.29	MID-LEVEL (38.2%)	18.94
Very important	CORE (13.1%)	22.65	CORE (16.3%)	22.30

Table 4.2 Definitions of Variables in the Empirical Model

Variable	Definition	Kentucky		U.S.	
		Mean	Variance	Mean	Variance
Local food purchase	Farmers' markets purchase within the last 12 months	3.97	4.28	5.42	5.10
	Grocery purchase within the last 12 months	6.56	5.07	7.70	5.64
	Restaurant visits within the last 12 months	4.12	4.27	3.40	4.35
Male	=1 if a respondent is Male, and 0 otherwise	0.28	0.45	0.52	0.50
Age	Age of the customer (years)	45.51	15.85	47.40	16.61
Education	The highest level of education customer has completed (years)	13.94	2.23	15.37	1.92
Income	Total income before taxes during the past 12 months ($$$)	57.92	48.25	73.97	56.99

Table 4.3 Purchase Frequency by Income (events/12 months)

	% in Sample		Farmers market (Purchase Frequency)		Grocers (Purchase Frequency)		Restaurant (Purchase Frequency)	
Income	KY %	U.S. %	KY	U.S.	KY	U.S.	KY	U.S.
<$20,000	26.87	21.90	3.18	3.66	6.01	6.07	3.44	2.98
$20,000-$49,000	18.57	23.04	3.46	5.52	6.45	7.49	4.05	2.85
$50,000-$99,000	40.06	29.09	4.47	4.85	6.65	6.91	4.22	2.74
$100,000<	14.49	25.98	4.74	6.01	7.49	8.23	5.21	4.02
Average			3.96	5.01	6.65	7.17	4.23	3.14

Table 4.4 Purchase Frequency by Gender (events/12 months)

	% in Sample		Farmers Market (Purchase Frequency)		Grocers (Purchase Frequency)		Restaurant (Purchase Frequency)	
Gender	KY %	U.S. %	KY	U.S.	KY	U.S.	KY	U.S.
Female	71.51	51.80	3.98	5.24	6.72	7.71	4.17	3.28
Male	28.49	48.20	3.96	5.62	6.15	7.69	4.02	3.62
Average			3.97	5.42	6.43	7.70	4.02	2.22

Table 4.5 Purchase Frequency by Education (events/12 months)

	% in Sample		Farmers Market (Purchase Frequency)		Grocers (Purchase Frequency)		Restaurant (Purchase Frequency)	
Education	KY %	U.S. %	KY	U.S.	KY	U.S.	KY	U.S.
Some high school	4.98	1.14	2.78	1.29	6.96	4.57	4.00	1.29
High school graduate	25.62	10.29	3.54	4.98	6.50	7.19	3.89	3.35
Some college technical/trade certificate	37.49	28.76	4.69	5.36	6.28	7.91	3.73	3.28
College graduate	19.83	38.40	4.29	5.57	6.99	7.31	4.69	3.46
Postgraduate degree	12.48	21.41	4.76	5.68	6.72	8.51	5.10	3.80
Average			4.01	5.42	6.6	7.70	4.28	2.22

Table 4.6 Purchase Frequency Percentage

	Farmers market		Grocers		Restaurant	
Purchase Frequency	KY (%)	U.S. (%)	KY (%)	U.S. (%)	KY (%)	U.S. (%)
No purchase	25.25	22.22	9.23	11.93	23.48	39.54
1 to 5 time(s)	47.74	40.03	41.01	32.68	47.45	40.20
6 to 10 times	16.39	20.59	23.83	22.71	18.50	11.44
11 or more times	10.62	17.16	25.94	32.68	10.57	8.82
Total	100	100	100	100	100	100

*** significant at 1% , ** significant at 5% , * significant at 10%

Table 4.7 Purchase Frequency by Residency

	% in Sample		Farmers Market (Purchase Frequency)		Grocers (Purchase Frequency)		Restaurant (Purchase Frequency)	
	KY %	U.S. %	KY	U.S.	KY	U.S.	KY	U.S.
Rural	42.93	32.03	4.01	4.81	6.22	7.48	3.83	3.74
Urban	13.09	42.81	4.11	5.23	6.86	6.98	3.98	2.79
Suburban	43.99	25.16	3.90	5.03	6.80	7.23	4.44	3.01
Average	-	-	4.00	5.02	6.62	7.23	4.08	3.18
t-test	-	-	4.87***		2.60***		-4.88***	
P-value	-	-	0.000		0.000		0.000	

*** significant at 1% , ** significant at 5% , * significant at 10%

Table 4.8 Purchase Frequency Determinants across Local Food Marketing Channels

	Farmers market Model (1)		Grocers Model (2)		Restaurants Model (3)	
	KY	U.S.	KY	U.S.	KY	U.S.
Customer preferences						
MID-LEVEL	3.52*** (0.255)	2.79*** (0.503)	3.41*** (0.270)	3.77*** (0.505)	2.98*** (0.284)	2.72*** (0.554)
CORE	4.48*** (0.349)	6.64*** (0.658)	4.70*** (0.368)	4.72*** (0.668)	4.45*** (0.378)	3.45*** (0.729)
Male	-0.01 (0.257)	-0.93** (0.471)	-0.45* (0.273)	-0.47 (0.475)	-0.05 (0.283)	-0.79 (0.519)
Age	0.08* (0.044)	0.07 (0.084)	-0.03 (0.047)	0.02 (0.085)	0.014 (0.051)	-0.04 (0.095)
Age^2	-0.0007 (0.0004)	-0.0008 (0.0008)	-0.0007 (0.0004)	-0.0002 (0.0008)	-0.0006 (0.0005)	-0.0003 (0.001)
Education	0.12** (0.059)	0.06 (0.129)	-0.003 (0.062)	0.07 (0.129)	0.12* (0.065)	0.07 (0.142)
Income	0.03*** (0.006)	0.034** (0.010)	0.02*** (0.006)	0.02** (0.011)	0.03*** (0.006)	0.02** (0.012)
Income^2	-0.0001*** (0.00002)	-0.00009** (0.00003)	-0.00006** (0.00002)	-0.00007** (0.00003)	-0.00008*** 0.00002	-0.00004 (0.00003)
Urban	-0.24 (0.365)	0.59 (0.529)	0.70* (0.387)	-0.67 (0.532)	0.04 (0.402)	-1.23** (0.580)
Suburban	-0.37 (0.252)	0.42 (0.604)	0.49* (0.266)	-0.218 (0.60)	0.48* (0.281)	-1.00 (0.667)
N	1987	612	1792	612	1566	612
Pseudo R^2 (%)	.03	.03	.02	.02	.03	.02
LR chi2 (10)	335.51	113.69	290.18	84.61	266.29	74.80

*** significant at 1% , ** significant at 5% , * significant at 10%

CHAPTER 5. CONCLUSION

This dissertation discusses three essays in local food and consumers' willingness-to-pay as well as local food purchase frequency across market channels and its determinants. The firs essay discusses consumers' willingness-to-pay (WTP) for local food in alternative restaurant formats. We hypothesize that consumers' preferences are heterogeneous across alternative dining formats. We collected data through survey in 2018 from 1987 consumers in the State of Kentucky. In order to measure consumers' WTP for alternative restaurant formats fast casual, casual, and fine, we asked the respondents to choose the most favored options by various choice set questions of consumers' preferences for different combinations of food price, local sourcing and driving distance.

Our experimental design uses Conjoint choice experiment (CCE), which assumes Consumers' different preferences for product's attributes (In our study: restaurant's attributes) might affect consumers' purchase decision and behavior. A Latent Class Analysis (LCA) was performed to classify consumers into subgroups based on responses to questions regarding preferences for local sourcing in restaurants. Preferences for local sourcing are different across restaurant formats, however; it is always positive. Local sourcing is not only for high-end formats. Price and driving distance coefficients are as expected. WTP for driving distance is negative and decreases as we go to the upper-scale type of dining. WTP for local sourcing is positive, even in the fast-casual and casual dining restaurants. Kentucky Department of Agriculture could use our findings to evaluate the effectiveness of their local food promotion programs such as 'Buy Local', and 'Kentucky proud'. Another beneficiary group of these results are chefs and restaurant

owners. Our findings provide evidence on positive WTP for local food not only in fine dining but also in fast casual and casual dining formats, which could assure the owners about the positive profit margins of offering local food on their menu.

The second essay discusses WTP for local sourcing across alternative restaurant formats change for consumers in urban vs. rural communities. This study uses data from the first essay. The residency variable was define using a self-assigning question in our sample. We asked the respondents to select the option, which best describes their current living residency. The options include 'Larger City (Lexington, Louisville, Northern Kentucky)', 'Suburban area outside larger city', 'Smaller city (i.e. Elizabethtown, Bowling Green, Pikeville, etc.)', 'Rural (but not a farming community)', and 'A farming community'. This study provides information for state brand programs to improve their design. Evidence on consumers' positive WTP for local food in rural setting help state and local governments to consider strategies for local food promotion that include restaurants and consumers in rural and urban settings. This study guides the restaurants' owners to identify the feasibility of offering local food on restaurant's menu in different geographic areas as well as the extent to which their consumers are willing to pay. Positive consumers' WTP in rural setting in different formats of dining suggest distinct market segments and their sizes. Positive consumers' WTP in rural and urban setting for local food suggest a viable opportunity for rural restaurants to differentiate themselves in the market, which leads to economic development.

The third essay estimates local food purchasing frequency by locavores across market channels. In this chapter we aim to identify the factors that define consumers' behavior and frequency of purchasing of local products, and provide a comparison of

local food purchase patterns across market channels between KY and U.S. We use data collected from customers' feedbacks through two surveys. The first one was conducted on a sample of the U.S. food consumer population with 682 respondents in 2015. The second survey collected identical data from local food consumers in the state of Kentucky with 1987 responses between December 2019 and January 2020. We classified the consumers into different local sourcing preferences groups, we asked them "How important is local food to your consumer choices?"

Based on their responses, we categorized them as "PERIPHERY", "MID-LEVEL", and "CORE" customers. To "PERIPHERY group" purchasing of local food is "not at all important", 'slightly important", or "neutral", where to "MID-LEVEL" group of consumers includes those who indicated that local food is "important" to them. Lastly, to "core group" local food is "very important". The censored regression model or the Tobit model was selected to infer predictor variables effects on purchase frequency of local food across different market channels, while classifying potential buyers into different levels range from most PERIPHERY, to MID-LEVEL and CORE, based on the local food importance for them. These findings have significant marketing implications. For farmers and retailers in this sector, our results provide information on potential market segments and group of consumers with higher the purchase frequency of local food. For restaurant owners shows a potential market segment in this sector to target those consumers. These results could serve as a tool for community planners and stakeholders to assess their value adding developing strategies.

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https://www.wholefoodsmarket.com

Vita

Mahla Zare Mehrjerdi

Education

- M.S Economics, Drexel University, Philadelphia, U.S (2016)
- PhD Entrepreneurship - Business Creation, University of Tehran, Iran (2018)
- MA Entrepreneurship - Business Creation, University of Tehran, Iran (2011)
- B.S Agricultural Economics, Payam Noor University, Mashhad, Iran (2008)

Professional positions

- International Agriculture, World Food Needs and U.S Trade in Agricultural Products, University of Kentucky, US-(2018)
- Microeconomics, Macroeconomics and Econometrics volunteering tutoring, Economics Department, Drexel University, U.S. - (2015)
- Special words in Management & Entrepreneurship Lecturer at University of Tehran, Tehran, Iran (2013 - 2014)
- Official Entrepreneurship Lecturer at University of Applied Science and Technology, Tehran, Iran-(2014)
- Survey Research Methods Lecturer at Payam Noor University, Business Department, Mashhad, Iran-(2011)
- Creativity, Problem Solving, Strategic thinking Lecturer at Payam Noor University, Business Department, Mashhad, Iran-(2011)
- Entrepreneurship Lecturer at Payam Noor University, Business Department, Mashhad, Iran- (2011)

- Entrepreneurship Lecturer at University of Applied Science and Technology, Mashhad, Iran-(2012)

Scholarships and Professional Honors

- First Place Award in Poster Competition in Southern Agricultural Economics Association (SAEA), Louisville, Kentucky, USA, February 3-6, (2020)
- Second Place Award in Poster Competition in Southern Agricultural Economics Association (SAEA), Jacksonville, Florida, USA, February 3-6, (2018)
- Obtain the honor prize of one of the selected speakers in the 2nd international conference on entrepreneurship, February 22-23, 2014, Tehran, Iran
- Novin Daneshmand Research and Development Institute Fellowship (Scholarship) In Tehran, Department of research and education (Awarded to only four students)
- Faculty Fellowship (Scholarship) of the University of Tehran, Department of Entrepreneurship for master's degree
- Mahla Zare Mehrjerdi, Alison Davis, *"Consumers' willingness-to-pay for local food in restaurants"*, 2018-2019, University of Kentucky, Food Connection and Just Food Grants, $3,010,
- Alison Davis, Timothy Woods, Wuyang Hu, Mahla Zare Mehrjerdi *"Growing Local Food Demand: Evaluating the Kentucky Restaurant Rewards Program"*, 2016-2018, USDA-AMS-FSMIP, $73,890
- Timothy Woods, Mahla Zare Mehrjerdi, *"Legitimacy in Local Foods: KY Food Consumer Survey",* UK Research Activity Award, 2016, $2,500

Publications

- Mehrjerdi, M. Z., & Mark, T. (2018). Estimating the Productivity of Wheat Production: An Implication of Stochastic Frontier Production Function Model (No. 2015-2018-306).
- Mehrjerdi, M. Z., & Talebi, K. (2018). Toward a New Growth Measurement Model for Entrepreneurial Firms. Academy of Entrepreneurship Journal, 24(2), 1N.
- Mehrjerdi, M. Z., & Talebi, K. (2018). A Meta-Analysis on the Entrepreneurial Behavior and Growth Measurements. Journal of Organizational Behavior Research, Vol.: 3, Sayı / Is.: S2, Yıl/Year: 2018, Kod/ID: 81S2122
- Analysis of Marketing Margins Dried Fruit in Fars Province, International marketing management conference, Tehran, Iran, 2010.
- Economic development by funding high-tech SMEs through technology funds, the international conference of the association of Korean economic studies (AKES), 25-29 June, Tehran, Isfahan and Shiraz, Iran, 2013.
- Knowledge Management and SME development, ESD Conference - New York October2014.
- Identifying the process of entrepreneurial sense making: a grounded theory approach, international journal of management and humanity sciences, volume3, No10.
- Identifying the Main Factors Transforming Entrepreneurial Perseverance into Escalation of Commitment, journal of science and today`s world, volume3, issue5.
- Talebi, K., Mehrjerdi, M. Z., & Akbari, S. M. R. The Role of Knowledge Processing Management in SME Development and Economic Growth. China-USA Business Review, March 2016, Vol. 15, No. 3, 130136

- Consumers' Willingness to Pay for Local Food in Alternative Restaurant Formats: An Application of the Latent Class Approach, Southern Agricultural Economics Association (SAEA), Birmingham, Alabama, USA, February 2-5, (2019)
- Zare Mehrjerdi, M., & Saghaian, S. (2019). Corruption and Regulation across firms in selected developing countries.
- Corruption Determinants in Developing Countries, Southern Agricultural Economics Association (SAEA), Birmingham, Alabama, USA, February 2-5, (2019)
- Local Food System Vitality – Looking at Components across Consumer Age Groups, Agricultural & Applied Economics Association (AAEA), Washington, DC, August 5-7, (2018)
- Estimating the Productivity of Wheat Production in Iran: An Implication of Stochastic Frontier Production Function Model, Southern Agricultural Economics Association (SAEA), Jacksonville, Florida, USA, February 3-6, (2018)
- Local food purchasing frequency by locavores across market channels - implications for local food system development, Southern Agricultural Economics Association (SAEA), Jacksonville, Florida, USA, February 3-6, (2018)
- The determinants of informality in developing countries, RSAI 10th Annual Midwest Graduate Student Summit on Applied Economics and Regional Science (AERS), Ohio State University, USA, (2017)
- Zarj, M. A. B., Mehrjerdi, M. Z., & Hassanzadeh, A. (2012). Economic Development by Funding High-Tech SMEs through Technology Funds.