WILLINGNESS TO PAY FOR LOCALLY GROWN, ORGANIC AND NATURAL FOODS: IMPLICATIONS FOR PRODUCERS AND STATE-SPONSORED AGRICULTURAL MARKETING PROGRAMS FY 2008

A survey was conducted in five Mid-Atlantic states to determine consumer preference and marginal willingness to pay for the attributes *organic*, *natural, locally grown* and *state program promoted*. The influence of purchasing venue on willingness to pay was examined as well. A key part of the survey was a choice experiment featuring strawberry preserves and red tomatoes. The survey also included a variety of questions concerning shopping behavior, awareness and opinion of state marketing programs, and the geographical area that the respondent considered to be *local*.

The attributes *local* and *state program promoted* were preferred over *non-local* across all states. The preference ordering between *local* and *state program promoted* did vary. Consumers in Maryland and Pennsylvania clearly preferred *local*, while those in New Jersey seemed to prefer the *state program promoted*. This preference ordering overall was consistent regardless of whether a fresh or value added product was being investigated.

Overall, findings from this study suggest that several states should consider focusing on more generic "buy local" promotions, instead of statewide promotional programs. The results from this study also suggest that consumer preference for purchasing venue may vary within the same region, depending on whether a fresh or value added product is investigated. Additional results indicate that consumers from states other than Delaware consider areas smaller than the borders of their state as being *local*. Specifically, the results suggest that Mid-Atlantic consumers consider an area in their county, as well as up to 100 miles away in their state, to be *local*. Additional findings indicate that a majority of consumers consider a product to be *local* if it is between 81-100% locally grown and/or processed.

FINAL REPORT

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Willingness to Pay for Locally Grown, Organic and Natural Foods: Implications for Producers and State-Sponsored Agricultural Marketing Programs

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EXECUTIVE SUMMARY

A survey of Mid-Atlantic consumers in five states was conducted to determine consumer preference and marginal willingness to pay for the attributes organic, natural, locally grown and state program promoted. The influence of purchasing venue on willingness to pay was examined as well. A key part of this survey was a choice experiment featuring strawberry preserves and red tomatoes. The survey also included a variety of questions concerning shopping behavior, awareness and opinion of state marketing programs, and the geographical area that the respondent considered to be local.

The results of the choice experiment portion of the survey were analyzed using a conditional logit model and a nested logit model for the strawberry preserves CE data, and a mixed logit model for the tomatoes CE data. Marginal willingness to pay (mWTP) figures were calculated from the results of the nested logit and mixed logit models. These results indicated a price premium for preserves purchased at a farmers' market across five Mid-Atlantic states, and a price premium for tomatoes purchased from a farmers' market for three Mid-Atlantic states. The organic attribute was only preferred over natural and conventional in one state, Maryland.

Predicted probabilities were also computed for each model, and graphically displayed the probability of choice by price for the attributes investigated. The attributes local and state program promoted were preferred over non-local across all states. The preference ordering between local and state program did vary. Consumers in Maryland and Pennsylvania clearly preferred local, while those in New Jersey seemed to prefer the state program version. This preference ordering overall was consistent regardless of whether a fresh or value added product was being investigated.

Overall, findings from this study suggest programs in several states should consider focusing on more generic “buy local” promotions, instead of statewide promotional programs. The results from this study also suggest that consumer preference for purchasing venue may vary within the same region, depending on whether a fresh or value added product is investigated. Additional results indicate that consumers from states other than Delaware consider areas smaller than the borders of their state as being local. Specifically, the results suggest that the Mid-Atlantic consumer considers an area in their county, as well as up to 100 miles away in their state, to be local. Additional findings indicate that a majority of consumers consider a product to be local if it is between 81-100% locally grown and/or processed.

Limitations to this study include being unable to display state program logos in the survey, as approval from each state agency for including these logos was unable to be obtained. Suggestions for future research involve investigating whether or not state programs in larger states in the Mid-Atlantic should be continued, as well as the ability for existing successful programs such as *Jersey Fresh* to be able to capture increased premiums from consumers in surrounding states. The results of this study would be of use to state marketing agencies, producers and processors targeting the Mid-Atlantic region.

Section 1
INTRODUCTION

1.1 Recent Trends in the Food Sector

Increases in the organic and natural food sectors, as well as an increased interest in locally grown and state marketing program promoted foods, are four current trends in the U.S. food system. The organic food sector is the largest growing and most promoted of these. Since 2002, the USDA's National Organic Program (NOP) has been certifying organic products, providing labels and standardization. Evidence of organic growth is evident in the amount of farmland set aside for certified organic production, which doubled from 2002 to 2005, and in 2008 alone grew 15% (USDA, ERS, 2010). From 1990 to 2009, sales of organic food products grew $23.8 billion, growing an average of 5.1% in 2009 (Organic Trade Association, 2010). In addition, organic food sales more than doubled from 2004 to 2008, growing 132% (The Nielsen Company, 2009).

Unlike organic products, products designated as natural are not subject to a certification process and bear no standardized label. The USDA does have a formal definition for the term though, which includes no artificial ingredients, no added color and minimal processing. According to research conducted by The Nielsen Company (2009) food products designated as natural experienced a 37% increase in sales from 2004 to 2008. They also reported 55,000 food products currently feature labeling identifying them as 'natural'. While products bearing the term natural may lack the standardized label present on their organic counterparts, they certainly are not lacking in growth.

Additionally, from 1994 to 2009, the United States witnessed a 201% increase in the number of operating farmers' markets, which mostly sell products that are locally grown and/or locally made (USDA, AMS, 2009). Sales of locally grown foods are projected to reach $7 billion by 2011 (Packaged Facts, 2007). Unlike products designated as organic or natural, there is no set USDA definition for locally grown. The term's definition is still undefined, often with a different meaning for each person. One's definition for locally grown may be interpreted as a

small area, such as a city and its surroundings, or the borders of their state of residence and/or region. In addition, products designated as locally grown are somewhat similar to those labeled as natural in that there is also no formal certification process.

As interest in locally grown foods continues to rise, state-sponsored marketing campaigns have responded by increasing in number. Not surprisingly, many states are attempting to take advantage of this increased interest in locally grown by marketing products from within their own borders. Every state now has in place some type of marketing campaign, which includes logos, slogans and a variety of promotional activities (Onken and Bernard, 2010). Some initial evidence shows such programs have been successful at increasing the sales of local products.

Well established programs such as *Jersey Fresh* have been shown to increase state agricultural sales (Govindasamy et al., 2004) as have some newer programs established after 2000, such as South Carolina's *SC Grown* (Carpio and Isengildina-Massa, 2009). However state marketing programs vary drastically by state in terms of product eligibility, certification, and the minimum percentage of product ingredients that must come from within that state.

There has also been some evidence that consumers show little preference difference between products identified as locally grown and those identified as grown in-state. A study conducted in Ohio showed consumers showing little preference difference for fresh strawberries identified as grown "in-state" and those identified as grown "nearby" (Darby et al., 2008). However the authors also note that while consumers in larger states like Ohio may see state boundaries as natural demarcations for "local", individuals from smaller states may not. This brings up an interesting question for regions such as the Mid-Atlantic, where large states such as Pennsylvania border much smaller states such as Delaware. Will Pennsylvanians consider Delaware products to be 'local'? More likely Delawareans will consider Pennsylvania products to be 'local', due to Delaware's small size and its geographic location to Philadelphia, one of Pennsylvania's major cities. However such questions, particularly across states, are in need of

further research. The geographical extent of 'local' in the minds of consumers in regions such as the Mid-Atlantic still needs to be determined.

Understanding these growing trends of organic, natural, locally grown, and state marketing program promoted, as well as how they interact are all areas in need of further exploration. As the trend towards locally grown continues to rise, many state agencies instead might turn towards more generic local promotions, such as the current national *Buy Local, Buy Fresh* program sponsored by FoodRoutes (FoodRoutes Network, 2009). For state marketing programs, current evidence of their effectiveness, and continued justification for their existence and funding will be needed.

Comprehending consumer attitudes towards and preferences between these four trends, as well as determining marginal willingness to pay (mWTP) would be of importance to producers, marketers and state marketing agencies. It would also be important to determine how these preferences and mWTP might differ across states in the same region. While all four trends vary greatly in terms of certification and formal definition, they are all currently present in the food industry and gaining in popularity.

Producers could use this information to help strategically plan what areas of the food industry they need to be producing product(s) for, and whether or not the attributes of their particular product(s) are meeting the needs of consumers in the Mid-Atlantic region. This information could also be extended towards consumers in the New England region, which likewise is a region with states of varying size. Marketers in the food industry could gain useful information that would effectively help them better reach and promote to their targeted audience. Knowing whether or not to market a product at a grocery store versus a farmers' market would be especially helpful information. It would be useful then to determine whether preference and mWTP for these attributes vary by purchasing venue. It would also be helpful to both producers and marketers to identify expectations consumers have for the attributes of locally grown and organic foods.

Lastly, state marketing agencies perhaps have the most to gain. The results of such research could help them determine whether or not their programs are effective in terms of consumer preference and/or awareness. It would be useful to determine the effect the length of a state marketing campaign has on consumer awareness, especially in a region such as the Mid-Atlantic, where programs vary greatly in length of establishment. It may also be useful in helping state agencies in determining whether or not their state marketing program should be continued, and if so, how they could better promote their program as to better meet the preferences of consumers in not just their particular state, but adjacent states as well.

1.2 Objectives

The primary and secondary goals of this research then are to determine:

1. consumer preference and mWTP for the attributes of locally grown, organic, natural, and promoted by a state marketing campaign,
2. how these preferences and mWTP may be different across states in the same region, and also depending on whether these products were to be purchased at a grocery store or a farmers' market,
3. the expectations consumers have for the attributes of locally grown and organic foods,
4. the geographical extent of 'local' in the minds of consumers, and
5. the effect of the length of the state marketing campaigns on consumer awareness.

To accomplish these goals a large scale mail survey was targeted at consumers from five states in the Mid-Atlantic region: Delaware, Maryland, Virginia, New Jersey, and Pennsylvania. The key part of this survey was a choice-based conjoint analysis, or choice experiment (CE), containing a value-added product, strawberry preserves, and a fresh product, red tomatoes. CEs have become prominent in marketing studies, especially those examining

consumer demand and WTP, such as Lusk and Hudson (2004) and Carlsson, Frykblom, and Lagerkvist (2007). Mailing lists of 1,000 from each state were purchased for a total potential sample of 5,000. To maximize the response rate, the guidelines of Salant and Dillman (1994) were followed, yielding a response rate of 39.6% at the close of the survey.

1.3 Organization of Final Report

Immediately following this introduction, Section 2 provides background information concerning the attributes natural, organic, and local. This section also discusses the state marketing programs of each state included in the survey. Section 3 next provides the critical literature review discussion, exposing areas in need of further exploration in which this study hopes to fill. Section 4 discusses the design of the survey, including the experimental design of the CE, and the mailing process. Also explored are the demographics of the respondents in the survey sample. Next Section 5 covers the methods used in analyzing the CE data, in particular the conditional logit model (CLM), the nested logit model, and the mixed logit model. Hypotheses are also specified at this stage. Section 6 presents the results of the strawberry preserves models, predicted probability graphs, and marginal willingness to pay (mWTP) estimates. Section 7 presents the results of the tomatoes model, predicted probability graphs, and marginal willingness to pay (mWTP) estimates. Section 8 presents the other survey question results. Lastly, Section 9 concludes with a discussion of the findings, as well as implications for future research.

Section 2
BACKGROUND

2.1 Organic and Natural Background

With the passing of the Organic Foods Production Act in 1990, the USDA began developing national standards for organic certification through the creation of the National Organic Program (NOP) (USDA, NOP, 2008). The NOP established a certification program for organic products, along with production and labeling standards. Concerning the meaning behind the term organic, the NOP specifies that crops must have been grown without the use of conventional pesticides, petroleum-based fertilizers, or sewage sludge-based fertilizers. For animals, it means that they must have been fed organic feed, given access to the outdoors, and given no antibiotics or growth hormones. In addition, the NOP states that organic also means no genetically modified ingredients and no irradiation.

A product may bear the organic label if it consists of at least 95% organic ingredients. Products containing at least 70% organic ingredients may display the phrase 'made with organic ingredients', but cannot display the USDA organic logo. In addition, anyone who knowingly uses the organic logo on a non-organic product is subject to a fine of up to $11,000 per offense (USDA, NOP, 2008).

Unlike the term organic, products bearing the term natural do not undergo any formal certification process. However, the USDA's Food Safety and Inspection Service do have a formal definition for the term under their food labeling guidelines governing meat and poultry. Under these guidelines, natural is defined to mean a product with no artificial ingredients, no added coloring, and minimal processing (USDA, FSIS, 2010). Although there is a formal definition in place for this term, the USDA does not inspect and certify such products. Therefore, the term natural often can often be found on a variety of food products. There has been some evidence that consumers lack a basic understanding as to the meanings behind the terms organic and natural (Gifford and Bernard, 2011). The NOP is concerned enough to state on their program webpage that the two terms are not the same.

2.2 Locally Grown Background

The recent consumer trend towards purchasing local food, referred to by some as the 'local food movement' has many attempting to define what consumers consider to be 'local'. Evidence of this trend towards local can even be seen in the term 'locavore' which according to Merriam-Webster means 'one who eats foods grown locally whenever possible' (Merriam-Webster Inc., 2010). The term's first known use is cited as 2005. The term local has a different meaning for each individual, and to date has no formal USDA definition or certification. Products labeled as local therefore may be from within the consumer's state, county, or a nearby state. As previously mentioned, the trend toward local has also spawned numerous buy local promotions across the country.

2.3 Mid-Atlantic State Marketing Programs

As of early 2010 all 50 states had in place some type of state agricultural marketing program. Although discontinued in early 2010, the Delaware Department of Agriculture's *Grown Fresh with Care in Delaware* marketing program was officially launched in 2007. While the Delaware Department of Agriculture's Marketing Section promoted the *Grown Fresh with Care in Delaware* program as "the first 'branded program' in Delaware history" (State of Delaware, DDA, 2009) it was not their first logo program. In the mid-1990's, the department attempted to launch and promote a logo identifying Delaware agricultural products. However, this initial effort was also short lived. The *Grown Fresh with Care* logo was allowed to be used on products with ingredients that originated from within the State of Delaware, although an actual percentage of ingredients were not defined.

According to the mission statement for the Delaware program, a product bearing the logo provided "a guarantee of freshness since products are supplied to supermarkets within 48 hours of being picked from the farm" (State of Delaware, DDA, 2009). At the time of the program's discontinuation though, there was no certification process in place to assure this

deadline was met. In addition to the *Grown Fresh with Care in Delaware* logo, a *Made Fresh with Care in Delaware* logo was briefly used in 2007 for products produced within the state.

The *Maryland's Best* marketing program was created by the Maryland Department of Agriculture's Marketing and Agribusiness Development Section in 2002. The program's stated mission is to "link Maryland farmers with consumers through….promotions and advertising" (State of Maryland, MDA, 2009). One of the main program venues of the *Maryland's Best* program remains their promotional website. Visitors to the website can search by commodity for local products and farmers' markets. The website also features a wholesale search designed specifically for retailers, as well as listings for agri-tourism sites and community supported agriculture.

Those interested in joining the *Maryland's Best* program must register online, and are only eligible if they are a grower or processor in Maryland. Once registered, information about their farm will appear on the *Maryland's Best* website. In addition, program members may purchase promotional materials online such as banners and signage. There is little evidence of any type of promotion beyond this. Similar to Delaware's former program, there is no certification process in place, nor is there any minimum percentage requirement in place for products bearing the *Maryland's Best* logo.

In contrast, one of the most well known state marketing programs currently in use, the New Jersey Department of Agriculture's *Jersey Fresh* program has expanded since its initial establishment in 1983 to encompass three additional logos: *Jersey Seafood*, *Jersey Grown* and *Jersey Bred*. Prompting many other states to spearhead their own marketing programs, *Jersey Fresh* began as a radio advertising campaign and was established "to promote and market New Jersey agricultural products" (State of New Jersey, NJDA, 2009). Agricultural products such as fresh fruits and vegetables, shell eggs and egg products, turkey, and chicken are items eligible to bear the *Jersey Fresh* logo.

In order to be permitted to use the logo, interested parties must first register with the Department of Agriculture's Quality Grading Program to ensure their products meet *Jersey*

Fresh quality standards. In addition to submitting an application for the *Jersey Fresh* Quality Grading Program, a $30 fee is assessed as well (State of New Jersey, NJDA, 2009). *Jersey Fresh* program members moreover are eligible to apply for grants and matching funds, to be used for promotional purposes. The *Jersey Bred* logo was created to allow farmers in the state to market both 4-H market lambs, and horses residing in New Jersey. The *Jersey Seafood* logo program is for use by fish farmers and fishermen based in New Jersey. Lastly, the *Jersey Grown* logo program was created to recognize nursery products such as trees, shrubs, flowers and plants grown within the State of New Jersey. Both the design and construction of the *Jersey Seafood* and *Jersey Grown* programs mimic the state's *Jersey Fresh* program.

Each separate logo has its own website, which contains information for consumers, retailers, and other industry members. Point-of-purchase materials for the various logos are available for purchase, to program members, through the New Jersey Department of Agriculture. Unlike the programs established in Maryland and Delaware, the *Jersey Fresh* program does have in place a formal certification process, and requires that 100 percent of a product's ingredients must be from within the state.

PA Preferred, the Pennsylvania Department of Agriculture's marketing logo established in 2004, is currently in use on both processed and unprocessed products. Qualifications in order for fresh, unprocessed food products, nursery and other various agricultural items to carry the logo include that they must be either 100% Pennsylvanian, or grown at least 75% of the time in Pennsylvania. Processed products must receive their final packaging and processing in Pennsylvania, and if the primary ingredients of the product are grown in Pennsylvania, the processor must agree to buy as many Pennsylvania grown ingredients as possible, subject to availability (Commonwealth of Pennsylvania, PDA, 2009). In order to obtain a license to use the *PA Preferred* logo, as well as become a program member, interested parties must complete an online contact form, and then be personally contacted by a *PA Preferred* representative. Industry associates such as retailers, distributors, restaurants and food service operators may become licensed program members as well. Although there is a minimum

percentage requirement in place, there is no formal certification process. The *PA Preferred* program appears to be more active than programs in both Delaware and Maryland.

Lastly the Virginia Department of Agriculture and Consumer Services' *Virginia's Finest* trademark program was introduced in 1989 as a way for the state to "differentiate and promote top quality Virginia-produced and processed agricultural products" (Commonwealth of Virginia, VDACS, 2009). In order for interested parties to use the logo, they must first be a Virginia agricultural producer, or food processor, with a product that meets the program's quality standards. While there is no associated fee involved with participating in the *Virginia's Finest* program, potential participants must first meet their specific industry's standards, as well as receive certification from the Virginia Department of Agriculture and Consumer Services. Processed food products wishing to utilize the logo must also be approved by a special review committee. Once certified to use the *Virginia's Finest* logo, participants are then listed in the searchable Virginia's Finest Directory, which is available online and appears to be the program's primary vehicle of promotion. There is no set minimum percentage requirement for a product to be able to bear the program logo.

All five of these state marketing programs vary greatly in terms of program length, level of establishment and promotion, as well as certification and percentage requirements. With such drastic variation evident among programs, it would be interesting to see if consumer preference differs for locally grown compared to state program promoted foods by state. Halloran and Martin (1989) witnessed an earlier rise in state promotional programs during the 1980's, and discussed how states were unlikely to witness long-term benefits from a state sponsored marketing program unless that state held a substantial share of the market for a particular product. As New Jersey is particularly well known for their fresh produce, it would be interesting to see if consumer preference for *Jersey Fresh* foods was higher when compared to consumer preference for state program promoted foods in neighboring states.

Perhaps length of program establishment though is an important factor, or perhaps consumers have little preference difference between locally grown and state program promoted

foods. Whether or not state marketing programs are in fact important in helping shape consumer preference would be a key piece of information for these state marketing agencies.

2.4 Farmers' Markets in the Mid-Atlantic

In investigating a fresh produce item such as tomatoes, commonly found at a farmers' market location, it is important to understand the presence of farmers' markets within the region. According to the USDA's Agricultural Marketing Service (AMS) which maintains a current, searchable database of farmers' markets across the U.S., there is some variability in terms of the volume of markets per state. For starters, Delaware currently only has 12 markets listed; however this is a noteworthy number considering the state only consists of three counties. While Delaware is the smallest state in size included in our investigation, next-smallest New Jersey boasts 122 markets within their state. Pennsylvania and Virginia each have 229 and 172 markets listed, respectively, with Maryland having listed 79 operating farmers' markets (USDA, AMS, 2011a).

A view of the USDA's National Map of Farmers Markets shows a heavy clustering of markets not just in the eastern portion of the U.S., but particularly in the Mid-Atlantic region, as compared to the rest of the country (USDA, AMS, 2011b). The large amount of farmers' markets present in this region suggests a possible increased interest by Mid-Atlantic consumers in this venue attribute.

Section 3
LITERATURE REVIEW

3.1 Introduction

Once the general topic area of interest was defined, a thorough literature review was conducted to help identify opportunities for further research. The first section of the literature review discusses previous research related to consumer interest in locally grown, as well as consumer preference and WTP for the local attribute. The next section of the literature review concerns past research attempting to define locally grown, only one of which was conducted within the Mid-Atlantic region over a decade earlier. Subsequent literature review sections include previous studies concerning the effectiveness of state marketing programs at increasing consumer demand, as well as consumer preference and WTP for the attributes organic and natural.

3.2 The Trend Towards Locally Grown

3.2.1 Consumer Interest in Local

Evidence of consumer demand for locally grown products continues to grow. The trend towards local can even be witnessed in the marketing activities of snack-food giant Frito-Lay, who in 2009 made "Lay's Local" their primary promotional campaign (Horovitz, 2009). First Lady Michelle Obama has been cited advocating "the need for fresh, unprocessed, locally grown food…" (Martin, 2009). In July 2009, 60 Minutes star Andy Rooney filmed a segment while produce shopping, declaring throughout that fresh produce should be local (CBS Videos Online, 2009).

Several studies have been conducted concerning consumer preference for locally grown foods as well. Darby et al. (2008) conducted a study featuring a choice experiment of Ohio residents, and found consumers preferred locally grown foods over those grown in the

United States, with farm and farmers' market shoppers exhibiting almost twice the willingness to pay (WTP) for local products. They also suggested that for larger states, such as Ohio, state boundaries may serve as natural borders in the minds of consumers when it comes to defining what is 'local'. The authors however stressed that this might not be the case for smaller states, such as those in New England. It would be beneficial then to conduct a study across states in the Mid-Atlantic region, which is comprised of both small and large states, and see if state size does matter when defining local, or if perhaps it varies by region.

In an earlier study conducted in Arizona, Patterson et al. (1999) similarly concluded that a majority of consumers prefer to purchase local products, in particular those identified under the *Arizona Grown* logo, compared to those products identified as being from other regions. However, they found little prior consumer awareness of the *Arizona Grown* marketing program. In addition the authors focused on only the grocery store purchasing venue. A more recent study by Nganje, Hughner, and Lee (2011) investigating the Arizona Grown label featured a CE of spinach and carrots. The authors concluded that consumers were willing to pay a price premium for produce identified as Arizona Grown compared to produce identified as local. Both of these studies were one-state studies in rather large states, as opposed to a regional study investigating consumer preference for local across states.

A study by Thilmany, Bond and Bond (2008) surveyed U.S. consumers and concluded a greater value was often placed on local production over organic production. They also found consumers who mainly purchased local foods because they viewed their purchase as economically supporting agriculture, exhibited a WTP of 7.3% more for local products. This study though examined data from a prior national survey effort that used Likert-scale responses, and did not investigate preference for state marketing program promoted foods. It is realistic to assume that consumers in different regions would have different definitions for what they consider to be 'local'. Therefore a regional study as opposed to a national study might be more accurate in terms of uncovering preference and WTP for local foods.

Hu, Woods, and Bastin (2009) investigated Kentucky consumer's WTP for processed blueberry products, and found consumer preference strongest for products identified as local, as opposed to products identified as organic and products identified as sugar free. The authors employed the use of a choice experiment that featured six different value-added food products. Although they were interested in determining consumer preference for the attributes of local and organic, they were also interested in determining how consumer preference differed among the different blueberry value-added products. They found the attribute organic was not as valued for two of the more value-added products included: blueberry muffin mix and blueberry fruit rollups.

A study conducted by Yue and Tong (2009) also investigated consumer WTP, exploring preference for local and organic tomatoes in Minnesota through the use of two separate CEs analyzed using a model of mixed logit form. They found consumers exhibited a similar WTP for both organic and local fresh tomatoes. For the purposes of their study, they identified the local tomatoes with the state program slogan *Minnesota Grown*.

Loureiro and Hine (2002) surveyed Colorado consumers and concluded consumers were willing to pay a higher premium for potatoes designated as *Colorado Grown* compared to potatoes identified as organic or GMO-free. Instead of using a choice experiment, the authors employed the use of a payment card format, where respondents could place 'bids' by choosing a price listed in order to determine WTP. Schneider and Francis (2005) conducted a survey in Nebraska and found 36% of respondents willing to pay at least a 10% price premium for local products from within their state county. It is important to note that this particular study was conducted in only one county in Nebraska, and therefore only limited conclusions can be made.

A survey of Indiana consumers by Jekanowski, Williams, and Schiek (2000) found the perceived quality of a local product had the strongest impact on one's purchasing likelihood. They also reported that their results suggested a demand for local products that a well planned state marketing program could capture. However they emphasized that if state programs allowed their quality standards to fall below those of competing states, ultimately such a state would

quintessentially be branding their products as “lower quality”. With such evidence that state programs could be successful at capturing the local consumer, it would be important to include both state sponsored and local food products when investigating consumer preferences.

Additionally Giraud, Bond, and Bond (2005) surveyed consumers from Maine, Vermont and New Hampshire. They found consumers from all three states willing to pay a price premium for local specialty food products from within their state. Specific specialty food products were not identified. Instead respondents were told their ‘specialty food product’ was either valued at $5 a unit or $20 a unit.

While all of these previous studies have investigated consumer preference for local, none have conducted a regional study examining both local and state marketing program promoted foods across states, and none have attempted to define what is ‘local’. In addition, only two studies mentioned employed the use of a choice experiment, noted to be particularly useful as they imitate the actual choices consumers face while shopping (Lusk and Hudson, 2004).

3.2.2 Defining Locally Grown

Vermont is currently the only known state to have in place a state-specific local logo. Their *Buy Local* program even includes a state definition for local: “a product grown within 30 miles of the place of sale, or within the State of Vermont” (Vermont Agency of Agriculture, 2009). As previously mentioned, a study by Darby et al. (2008) suggested for larger states that consumers may consider the natural geographical borders of their state to be a boundary for defining what is local. Gallons et al. (1997) surveyed Delaware households and found that for fresh produce, when asked what areas defined “locally grown fresh produce” an average of 83% of respondents considered Delaware to be local, with 48% considering Delmarva to be local, 42% Southern New Jersey and 34% Southern Pennsylvania respectfully. Some time has passed since this study was conducted, and the need for more updated research and analysis is evident.

Brown (2003) conducted a survey of households in Missouri, and concluded that when it came to defining locally grown, consumers considered local to be a region smaller than within state borders. She found that the distance a product traveled mattered more than whether it was from within one's state, and that local can cross state lines. She similarly found a lack of consumer awareness for Missouri's state marketing program *AgriMissouri*. Households surveyed were limited to the southeastern region of Missouri.

Hand and Martinez (2010) discussed how actual definitions for local can help illuminate consumer demand for local products, but that no one definition would suffice. Should definitions for local foods then be state specific, such as currently is seen in Vermont, or should they be region specific? Such a regional study would be important in helping determine this.

Hu, Batte, Woods, and Ernst (2010) also attempted to determine a definition for local by conducting an online survey of Ohio and Kentucky residents. They found that 73% of consumers in their sample considered food products to be local if they were from a distance of less than 100 miles. The authors similarly concluded that consumers seem to place a higher importance on the local production attribute for fresh food products. It would be interesting to conduct a study across several states of varying size, yet also in the same region.

3.3 State Marketing Programs

With studies showing consumer preference for local, there is increasing evidence that state-sponsored marketing programs are successful in increasing demand and sales for local products. Carpio and Isengildina-Massa (2009) evaluated South Carolina's agricultural marketing program *SC Grown* in which they found consumer demand for South Carolina grown produce had risen 3.4% one year after the program's inception. They further estimated producer surplus from this increase to be around $2.9 million.

Research conducted by the California Department of Agriculture and the Buy California Marketing Agreement found sales of California agricultural products had increased 7.1% since the start of the *CA Grown* program in 2002, amounting to almost $900 million (State

of California, BCMA, 2009). Govindasamy et al. (2004) estimated that for the year 2000, the *Jersey Fresh* program had increased the sales of fresh produce alone by $36.6 million. They calculated that for every dollar that year allocated towards the promotion of *Jersey Fresh*, $54.49 in total economic output was gained for the State of New Jersey. Hanagriff, Lau, and Rogers (2009) conducted a study of the Texas wine industry, mainly supported and promoted under the *Go Texan* program. They found in 2007, for each dollar spent on promoting Texas wine, total sales increased by $2.16.

It is important to note that the figures for New Jersey seem especially high in comparison to the other mentioned state marketing programs. These preliminary findings seem to show a promising return for efforts though involved with state marketing programs, and their accompanying local food products. With three of the five state programs targeted in this survey created after 2000, this study provides a unique opportunity to compare previously established programs with newer less established programs. It also provides the opportunity to compare consumer preference for and knowledge of state marketing promoted foods on a regional level. Conducting similar surveys across all five states affords the opportunity to accurately compare and contrast consumer preferences in this region.

3.4 Consumer Preferences and WTP for Organic

Since the labeling and certification of organic products through the National Organic Program (NOP) in 2002, interest in organic foods has prompted numerous studies concerning consumer preference and WTP. Yiridoe, Bonti-Ankomah, and Martin (2005) conducted a review of the current literature, and concluded consumer WTP for organic products appears to decrease with premium level. Hughner et al. (2007) performed a similar compilation, and argued consumer interest in organic products varied much in part to a lack of basic understanding for what ‘organic’ means.

Batte et al. (2007) conducted a survey of Ohio residents in seven different grocery stores, and concluded consumers were willing to pay a price premium for organic products, even

those with less than 100% organic ingredients. The farmers' market purchasing venue was not investigated in this study.

Bond, Thilmany and Bond (2008) surveyed U.S. consumers, and concluded consumers placed a value on organic production, and may even view organic products as being of higher quality. It would be interesting to see if such a result is the case for a more regional study. Organic products were found by Stegelin (2008) to also make up a significant portion of 'local' products purchased by consumers, although the study was a limited first attempt with a small sample size. It would be interesting to determine if consumer preference for products identified as both local and organic differs from products identified as both local and natural. However does consumer preference for the organic attribute differ by purchasing venue?

Using a similar region as this study, Shuzzler, Govindasamy, and Adelaja (2003) compared the profiles of organic consumers in New Jersey to those in New York and Pennsylvania. Govindasamy and Italia (1999) surveyed New Jersey consumers at several grocery store locations, and found their results suggested consumers were willing to pay a price premium in order to obtain organic fresh produce. Organic value-added products were not included in this particular study. It would be useful to investigate consumer preference for the organic production attribute across purchasing venues (grocery store vs. farmers' market) on a regional level.

Existing literature looking at consumer preference and WTP for natural food is not as prevalent as studies addressing organic, with much room for contribution. A study conducted by Gifford and Bernard (2011), in which experimental auctions were conducted, found that many consumers have little knowledge as to what the term natural actually means. They also found many consumers believed the terms natural and organic had the same requirements, until presented with the actual standards for each.

3.5 Purchasing Venue Preference

Studies examining consumer preference for purchasing venue have been mixed in their conclusions. A WTP experiment by Toler et al. (2009) investigated Oklahoma consumers' preference for grocery store and farmers' market settings, and concluded that WTP did not differ between the two venues. However, they did conclude that participants preferred to allocate more of their money towards purchases from local farmers, compared to non local farmers. Onianwa, Mojica, and Wheelock (2006) identified several areas where consumers had a preference for farmers' markets over supermarkets, including the atmosphere. Zepeda and Leviten-Reid (2004) also noted similar advantages for farmers' markets, such as being seen as a form of entertainment or chance to interact with farmers.

3.6 Summary

The literature review conducted above exposed several areas of opportunity for further research, as relates to this project. It was discovered that only a few previous studies employed the use of a CE. In addition, there is also a need for a more recent study examining how Mid-Atlantic consumers define local. The majority of previous studies addressing a definition for local were conducted in primarily large states. Investigating previous studies looking at the effectiveness of state marketing programs found evidence that they increase consumer demand, but the majority of these studies did not address consumer awareness and preference for such programs in nearby states. Lastly, while there is a wide array of available literature concerning preference and WTP for the organic attribute, previous studies investigating the natural attribute have been few.

Section 4
SURVEY DESIGN

4.1 Survey Choice Experiment

As previously noted, a key part of the survey was a choice experiment designed to determine consumer preference and WTP. Prominently used in marketing research, Lusk and Hudson (2004) noted choice experiments are particularly useful because they closely mimic actual consumer shopping behavior. Examples of previous studies using choice experiments includes earlier work by Lusk, Roosen, and Fox (2003), Alfnes et al. (2006), and Carlsson, Frykblom, and Lagerkvist (2007).

The choice experiment here was constructed using SAS software (SAS Institute Inc., 2010) and methods developed by Kuhfeld (2009), and featured the value-added food product strawberry preserves and the fresh product red tomatoes. This product was chosen for several reasons. First, given the five state scope of the survey, strawberry preserves and red tomatoes are available locally in each state, as well as under each state's promotional slogan. They are also familiar products that a majority of consumers should recognize, and are neither considered region-specific or state-specific.

The experimental design used featured four product attributes. They included purchase venue, production method, price and location. The attribute price had three levels ($2.99, $3.99, and $4.99) for strawberry preserves, and three levels for red tomatoes ($2.49, $3.99, and $5.49). Purchase venue contained two levels: grocery store and farmers' market. Prices were determined using current market prices from a wide range of purchasing venues.

Production method also had two levels, organic and natural for strawberry preserves, and organic and conventional for red tomatoes. As the majority of strawberry preserves available on the market are identified as "natural", the attribute conventional was not included for preserves. Lastly location had three levels, which included local, non-local and depending on the state, either the slogan *Jersey Fresh, PA Preferred, Maryland's Best, Virginia's Finest,* or

Grown Fresh with Care in Delaware. The attributes that appeared in the experimental design can be viewed below in Table 4.1:

Table 4.1. Choice Experiment Attributes

Attribute	Levels
Location	Local, Non-Local, State Marketing Program (*Grown Fresh with Care in Delaware, Maryland's Best, Jersey Fresh, PA Preferred, Virginia's Finest*)
Production Method	Natural, Organic (Strawberry Preserves) Conventional, Organic (Tomatoes)
Purchasing Venue	Grocery Store, Farmers' Market
Price	$2.99, $3.99, $4.99 (Strawberry Preserves) $2.49, $3.99, $5.49 (Tomatoes)

Note: The level "State Marketing Program" featured the program slogan of the respondent's state.

Following examples and macros created by Kuhfeld (2009), the choice experiment was constructed as a branded study, allowing for the labeling of each alternative per set, as well as the ability to add a constant 'none of these' or no purchase option. The 'labeling' used in this design was the attribute location. By specifying the number and level of attributes to be included, a reasonable size for the experimental design, minimizing violations of balance and orthogonality was first generated. From this suggested number of choice sets, an efficient design was next constructed. This design attempts to optimize D-efficiency, the standard measure of the goodness of the experimental design, by searching for a candidate design in part by using the OPTEX procedure of SAS. At this stage of construction, a balanced and orthogonal design with 100% D-efficiency was identified and the variance matrix for a linear model was optimized.

The linear design was next converted to a choice design by specifying the number of alternatives per set, and the number of attributes to be displayed per alternative. The choice design was evaluated again, but this time to optimize the variance matrix for a multinomial logit

model, and the design was restricted to 12 choice sets. At this stage parameters were also specified: price^2 is added, and interactions between price and purchase venue, price and production method, and purchase venue and production method are added. Lastly, the 12 choice sets were blocked into two blocks of 6 sets each, with blocks checked for duplicate choice sets.

The final experimental design contained four choices per set, with one being the constant "none" alternative. Each respondent was presented with six sets of strawberry preserves and six sets of tomatoes to avoid respondent fatigue, with two different choice experiment versions mailed per state. A sample choice set for strawberry preserves and tomatoes can be viewed below in Figure 4.1 and Figure 4.2 respectively:

Figure 4.1. Sample Choice Set, Strawberry Preserves

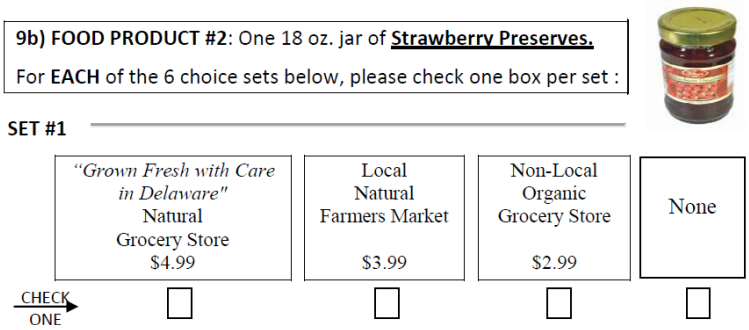
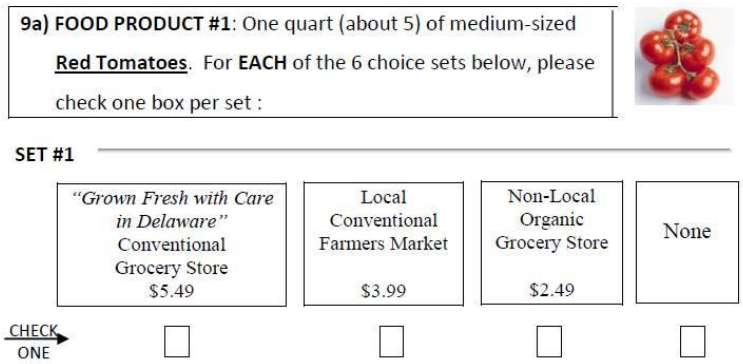


Figure 4.2. Sample Choice Set, Tomatoes



4.2 Other Survey Components

In addition to the choice experiment, the survey contained several other questions to gain a better understanding of consumer preferences. These included questions regarding their knowledge and opinion of the five state marketing programs, as well as how often they purchase food products from a grocery store and/or farmers' market. In addition, questions on how they rated local, organic and state program promoted foods in term of factors such as taste, safety and the environment, and the area they considered to be 'local' were also included. Lastly, the survey contained standard demographic questions to use in modeling, and a section where respondents could write comments if they chose.

Accompanying the survey form was an information sheet respondents were asked to read prior to completing the survey. This sheet contained definitions and explanations for five terms appearing throughout the survey. Definitions for the terms organic, natural and conventional were adapted from formal USDA definitions and included. A brief discussion of the terms local and state marketing program were also incorporated. Since exact definitions for these two terms are not available, it was mentioned that the term local is flexible, often with a different meaning for each person, as well as how state marketing program components frequently vary by state.

4.3 Survey Piloting

The survey was initially piloted in September 2009 on about 20 junior and senior undergraduate students over two days in Dr. John Bernard's FREC 404 Food and Fiber Marketing course, as well as on 30 sophomore undergraduate students in Andrew Carroll's PSYC 200 Research Methods course. Initial feedback was taken into consideration and the choice experiment portion of the survey was then piloted a second time on students in Dr.

Bernard's same class. The survey was also piloted on several graduate students in the Department of Food and Resource Economics, as well as various volunteers.

4.4 Survey Sample and Mailing

Mailing lists of 1,000 households from five states: Delaware, Maryland, Virginia, New Jersey, and Pennsylvania, were purchased through USAData in September 2009, for a total potential sample of 5,000. Following the guidelines of Salant and Dillman (1994) to maximize our response rate, an advance pre-notice postcard was mailed the third week in October announcing the survey. A first mailing of the survey was then sent the first of November. This first mailing included a cover letter explaining the importance of the survey, the survey and accompanying information sheet, a stamped return envelope and a $1 token of appreciation. A copy of the cover letter can be found in Appendix I. A reminder postcard was next mailed, followed by a second full survey mailing to all who had not yet responded. At the close of the survey the overall response rate was 39.6%. The total sample was 4,661 after undeliverable addresses were removed. Response rates by individual state can be viewed below in Table 4.2:

Table 4.2. Response Rates by State

State	Response Rate (%) (No. of Surveys)	Sample
Delaware	45.5 (424)	933
Maryland	39.1 (358)	915
New Jersey	36.7 (343)	934
Pennsylvania	40.5 (382)	944
Virginia	36.3 (339)	935
Total	39.6 (1846)	4661

4.5 Sample Population

Demographics of the respondents in the survey sample were compared to the population of each state according to the 2000 Census[1], and can be viewed in Table 4.3. Demographics by state, from the 2000 Census, can be viewed in Table 4.4. Although the population of each state is fairly represented by the survey sample, possible bias include less racial diversity, slightly higher education levels and slightly higher income levels for the survey respondents.

[1] 2000 Census figures can be viewed online at http://www.census.gov/.

Table 4.3. Demographics of Respondents in the Survey Sample

	Delaware		Maryland		New Jersey		Pennsylvania		Virginia	
	Number	%	Number	%	Number	%	Number	%	Number	%
Gender:										
Male	164	43.16	172	51.50	142	46.71	162	46.96	155	51.33
Female	216	56.84	162	48.50	162	53.29	183	53.04	147	48.67
Age (in years):										
Under 25	5	1.32	10	3.00	2	0.66	6	1.74	4	1.32
25-34	34	8.97	36	10.81	30	9.84	25	7.27	31	10.23
35-44	63	16.62	41	12.31	60	19.67	66	19.19	56	18.48
45-54	89	23.48	78	23.42	78	25.57	82	23.84	77	25.41
55-59	45	11.87	53	15.92	33	10.82	46	13.37	28	9.24
60-64	43	11.35	33	9.91	25	8.20	35	10.17	36	11.88
65-69	40	10.55	32	9.61	24	7.87	21	6.10	24	7.93
70-74	31	8.18	15	4.50	20	6.56	20	5.81	16	5.28
75-79	12	3.17	18	5.41	12	3.93	19	5.52	12	3.96
80 or above	17	4.49	17	5.11	21	6.88	24	6.99	19	6.27
Education:										
< High school graduate	13	3.45	4	1.21	10	3.28	6	1.73	20	6.60
High school graduate	76	20.16	47	14.15	63	20.66	99	28.61	39	12.87
Some college, no degree	98	25.99	63	18.97	53	17.38	64	18.51	60	19.80
Associate degree	37	9.81	31	9.34	27	8.85	29	8.38	24	7.92
Bachelor degree	79	20.96	82	24.70	73	23.93	88	25.43	92	30.37
Graduate or professional degree	74	19.63	105	31.63	79	25.90	60	17.34	68	22.44

	Delaware		Maryland		New Jersey		Pennsylvania		Virginia	
	Number	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Children under the age of 18 in household?:										
Yes	120	32.34	85	25.76	110	36.55	101	29.28	97	32.33
No	251	67.66	245	74.24	191	63.45	244	70.72	203	67.67
Race:										
White	335	85.24	254	77.44	254	80.13	330	90.66	258	81.65
Black, African American	28	7.13	48	14.63	24	7.57	11	3.02	39	12.34
Hispanic or Latino	7	1.78	4	1.22	21	6.62	4	1.10	3	0.95
American Indian/Alaskan	4	1.02	0	0.00	1	0.31	0	0.00	0	0.00
Asian	12	3.05	14	4.27	13	4.10	13	3.57	10	3.16
Native Hawaiian/Other Pacific Islander	1	0.25	2	0.61	1	0.32	0	0.00	0	0.00
Other	6	1.53	6	1.83	3	0.95	6	1.65	6	1.90
Income:										
Less than $10,000	14	3.86	5	1.63	8	2.67	8	2.44	17	5.70
$10,000 to $14,999	10	2.75	8	2.61	7	2.33	23	7.01	15	5.03
$15,000 to $24,999	22	6.06	20	6.54	22	7.33	30	9.15	14	4.71
$25,000 to $34,999	37	10.19	15	4.90	18	6.01	40	12.21	24	8.05
$35,000 to $49,999	58	15.98	39	12.75	34	11.33	52	15.85	24	8.05
$50,000 to $74,999	92	25.34	59	19.28	53	17.67	54	16.46	66	22.15
$75,000 to $99,999	56	15.43	44	14.38	49	16.33	43	13.11	52	17.45
$100,000 to $124,999	18	4.96	42	13.72	37	12.33	39	11.89	24	8.05
$125,000 to $149,999	17	4.68	25	8.17	20	6.67	11	3.35	18	6.05
$150,000 to $199,999	24	6.62	19	6.21	25	8.33	17	5.18	22	7.38
$200,000 to $249,999	6	1.65	16	5.23	16	5.33	9	2.74	13	4.36
$250,000 or more	9	2.48	14	4.58	11	3.67	2	0.61	9	3.02

Table 4.4. 2000 Census, Source: U.S. Census Bureau

	Delaware %	Maryland %	New Jersey %	Pennsylvania %	Virginia %
Gender:					
Male	48.6	48.3	48.5	48.3	49.0
Female	51.4	51.7	51.5	51.7	51.0
Age (in years):					
15-19	7.1	6.7	6.2	6.9	6.8
20-24	6.6	5.9	5.7	6.1	6.8
25-34	13.9	14.1	14.1	12.7	14.6
35-44	16.3	17.3	17.1	15.9	17.0
45-54	13.3	14.3	13.8	13.9	14.1
55-59	5.0	5.1	5.0	5.0	5.1
60-64	4.1	3.8	3.9	4.2	3.9
65-74	7.2	6.1	6.8	7.9	6.1
75 or above	5.7	5.3	6.4	7.7	5.1
Education:					
< High school graduate	17.4	16.2	17.9	18.0	18.5
High school graduate	31.4	26.7	29.4	38.1	26.0
Some college, no degree	19.5	20.3	17.6	15.6	20.4
Associate degree	6.6	5.3	5.3	5.9	5.6
Bachelor degree	15.6	18.0	18.8	14.0	17.9
Graduate or professional degree	9.4	13.5	11.0	8.4	11.6

	Delaware %	Maryland %	New Jersey %	Pennsylvania %	Virginia %
Children under the age of 18 in household?:					
Yes	24.2	25.0	24.3	23.2	24.1
No	75.8	75.0	75.7	76.8	75.9
Race:					
White	74.6	64.0	72.6	85.4	72.3
Black, African American	19.2	27.9	13.6	10.0	19.6
Hispanic or Latino	4.8	4.3	13.3	3.2	4.7
American Indian/Alaskan	0.3	0.3	0.2	0.1	0.3
Asian	2.1	4.0	5.7	1.8	3.7
Native Hawaiian/Other Pacific Islander	0.0	0.0	0.0	0.0	0.1
Other	2.0	1.8	5.4	1.5	2.0
Income:					
Less than $10,000	7.1	6.9	7.0	9.7	7.9
$10,000 to $14,999	5.1	4.2	4.7	7.0	5.3
$15,000 to $24,999	11.3	9.5	9.3	13.7	11.4
$25,000 to $34,999	12.2	10.7	10.0	13.3	12.1
$35,000 to $49,999	16.9	15.4	14.3	16.9	16.5
$50,000 to $74,999	21.3	21.5	19.8	19.5	20.3
$75,000 to $99,999	12.0	13.5	13.5	9.6	11.4
$100,000 to $124,999	6.4	7.6	8.2	4.6	6.2
$125,000 to $149,999	3.0	4.0	4.5	2.1	3.3
$150,000 to $199,999	2.5	3.5	4.2	1.8	2.9
$200,000 or more	2.1	3.0	4.3	1.9	2.7

Section 5
METHODS

5.1 The CLM Model

The collected CE strawberry preserves data for all five states was first analyzed in SAS Version 9.2 (SAS Institute Inc., 2010) using a conditional logit model (CLM). The CLM uses the characteristics of the outcomes to predict the selected choice and to fit the data (Long, 1997, So and Kuhfeld, 2009). The predicted probability of the choices in the CLM is defined as:

$$\Pr(y_i = d \mid z_i) = \frac{\exp(z_{id}\gamma)}{\sum_{c=1}^{4} \exp(z_{ic}\gamma)}$$

(1)

where y_i is the choice for respondent i coded 1, 2, 3 or 4 to refer to state program, local, non local or none respectively, z_{id} is the vector of covariates for the *d*-th choice and γ is the common coefficient vector for all choices.

Conditional logit models are often the first approach when analyzing data collected from a CE. Examples of this can be seen in previous CE studies examining cottonseed choice (Banerjee, Hudson, and Martin, 2007), blueberry products (Hu, Woods, and Bastin, 2009), and incentive framing (Mazur and Bennett, 2010).

5.2 CLM Model, Strawberry Preserves

An overall joint-test was performed on the effect of state to determine if all five states should remain in the model, which was significant. Next likelihood ratio tests were performed on the overall effect of Organic, overall effect of Price, and overall effect of Market. As these three tests were significant, individual interactions were next tested. Likelihood ratio tests for Price^2, the interaction Price*Market, the interaction Price*Organic, and the interaction

Organic*Market were next performed. The effect of the interaction between Price*Organic and the interaction Organic*Market was not significant, and these two terms were removed from the model. Next overall joint-tests were performed for the effect of each of the choice variables, which were Local, NonLocal, and NoPurchase, which were all significant.

Overall joint-tests were next performed for the effect of state by each of the eight variables still present in the model at this point. State interaction terms with the variables Price^2, NoPurchase, Market, and the interaction Price*Market were removed. Demographic covariates were at first included in the model, but later removed due to issues with their ability to accurately represent the analyzed data. The final CLM model for strawberry preserves includes 20 variables, and the predicted probability for each choice, $\Pr(y_i = d \mid z_i)$, is more clearly interpreted by instead stating the CLM in terms of the utilities of each choice. The utilities for the final CLM model are given by:

$$\begin{aligned}
U(\text{State Program}) &= \beta_{12}\,\text{Market}_i + \beta_{13}\,\text{Price}_i\text{Market}_i + \beta_{14}\,\text{Price}_i + \beta_{15}\,\text{Price}_i^2 + \beta_{16}\,\text{Organic}_i + \\
&\quad \beta_{17}\,\text{MD}_i\text{Organic}_i + \beta_{18}\,\text{NJ}_i\text{Organic}_i + \beta_{19}\,\text{PA}_i\text{Organic}_i + \beta_{20}\,\text{VA}_i\,\text{Organic}_i + \varepsilon_i \\
U(\text{Local}) &= \beta_1\,\text{Local}_i + \beta_2\,\text{MD}_i\text{Local}_i + \beta_3\,\text{NJ}_i\text{Local}_i + \beta_4\,\text{PA}_i\text{Local}_i + \beta_5\,\text{VA}_i\text{Local}_i + \\
&\quad \beta_{12}\,\text{Market}_i + \beta_{13}\,\text{Price}_i\text{Market}_i + \beta_{14}\,\text{Price}_i + \beta_{15}\,\text{Price}_i^2 + \beta_{16}\,\text{Organic}_i + \\
&\quad \beta_{17}\,\text{MD}_i\text{Organic}_i + \beta_{18}\,\text{NJ}_i\text{Organic}_i + \beta_{19}\,\text{PA}_i\text{Organic}_i + \beta_{20}\,\text{VA}_i\text{Organic}_i + \varepsilon_i \\
U(\text{Non-Local}) &= \beta_7\,\text{NonLocal}_i + \beta_8\,\text{MD}_i\text{NonLocal}_i + \beta_8\,\text{NJ}_i\text{NonLocal}_i + \beta_9\,\text{PA}_i\text{NonLocal}_i + \\
&\quad \beta_{10}\,\text{VA}_i\text{NonLocal}_i + \beta_{12}\,\text{Market}_i + \beta_{13}\,\text{Price}_i\text{Market}_i + \beta_{14}\,\text{Price}_i + \beta_{15}\,\text{Price}_i^2 + \\
&\quad \beta_{16}\,\text{Organic}_i + \beta_{17}\,\text{MD}_i\text{Organic}_i + \beta_{18}\,\text{NJ}_i\text{Organic}_i + \beta_{19}\,\text{PA}_i\text{Organic}_i + \\
&\quad \beta_{20}\,\text{VA}_i\text{Organic}_i + \varepsilon_i \\
U(\text{No Purchase}) &= \beta_{11}\,\text{None}_i + \varepsilon_i
\end{aligned}$$

(2-5)

where the variables are as defined in Table 5.1 below. Reference coding is used throughout.

It is important to note that a concern with the CLM involves handling the independence from irrelevant alternatives (IIA), which can be tested for in the CLM but not addressed, as the model assumes IIA is not an issue. A perhaps superior model in that IIA can be addressed is the Nested Logit Model, where choices in the choice experiment are viewed as a decision tree, and the structure of the tree is specified as a sort of hierarchy. The Nested Logit Model therefore is a natural extension from the CLM, and is explored next.

Table 5.1. Variable Names and Descriptions, CLM and Nested Logit Model

Variable Name	Description
Local	1 if the respondent selected the Local choice option[1]
NonLocal	1 if the respondent selected the Non-Local choice option[1]
NoPurchase	1 if the respondent selected the No Purchase choice option[1]
Market	1 if the respondent chose the farmers' market venue[1]
Price	Price for an 18 oz. jar of strawberry preserves
Organic	1 if the respondent chose the organic attribute[1]
MD	1 if the respondent is from Maryland[1]
NJ	1 if the respondent is from New Jersey[1]
PA	1 if the respondent is from Pennsylvania[1]
VA	1 if the respondent is from Virginia[1]

[1]Dummy variable where value is zero otherwise

5.3 The Nested Logit Model

While the simplest approach to modeling a choice experiment is to use a CLM, this model assumes the independence of irrelevant alternatives (IIA). However, the no purchase option is very different from the options where preserves are purchased, and therefore it seems unlikely that IIA would hold. A natural extension beyond the CLM described above would be a two-level nested logit with state program, local and non-local in one nest, and no purchase in the

other. This allows choices within nests to be correlated and is a partial relaxation of the IIA assumption. Nested logit models of similar form have been used to model CE data in a variety of closely related fields. Examples include green energy electricity (Borchers, Duke, and Parsons, 2007), ethnic food (Camarena and Sanjuan, 2009), and public vs. private dentists (Kiiskinen, Suominen-Taipale, and Cairns, 2010).

According to Hensher and Greene (2002) care must be taken in normalizing such a nested model. The authors present three possible normalizations entitled RU1, RU2 and RU3. They additionally argue that the RU2 approach is generally the best, especially when the nested logit has a degenerate branch, meaning a branch in which there is only one choice. Therefore, a nested logit model with an RU2 normalization was next fitted.

Again referring back to Hensher and Greene, the choices themselves are called *elemental alternatives*. The choices State Program, Local, Non-Local and No Purchase are represented by k=1, 2, 3 and 4 respectively. The *elemental alternatives-level probabilities* are given by:

$$\mathrm{P}(k \mid i) = \frac{\exp\left(\mu(i)U(k)\right)}{\sum_{1}^{K_i} \exp\left(\mu(i)U(k)\right)} = \frac{\exp\left(\mu(i)U(k)\right)}{\exp(\mathrm{IV}(i))}$$

(6)

where $\mu(i)$ is the normalization constant for branch *i* and,

$$IV(i) = \ln\left(\sum_{1}^{K_i} \exp\left(\mu(i)U(k)\right)\right)$$

(7)

is the inclusive value for branch *i*. The branch level probabilities are given by:

$$p(i) = \frac{\exp(\mathrm{IV}(i)/\mu(i))}{\sum_{1}^{2} \exp\left(\mathrm{IV}(i)/\mu(i)\right)}.$$

(8)

The probabilities of choices $k = 1,2,3,4$ are given by $\Pr(k) = \mathrm{P}(k \mid i)\, p(i)$.

5.4 Nested Logit Model, Strawberry Preserves

As dictated by the experimental design discussed earlier, the original model included a quadratic functional form for Price as well as the interactions Price*Market, Price*Organic, and Organic*Market. Additionally, state interactions with each of the variables Price, Price^2, Market and Organic were also included. A series of likelihood ratio tests showed that a number of these terms were insignificant, and therefore were excluded from the model. If an interaction with state and an effect was significant, then all states were kept, even if individual state terms themselves were not significant. Since regionally the area of interest consisted of all five states, it seemed rational to include either all of the states or none at all. The series of likelihood ratio tests performed were similar to those discussed for the CLM earlier above. The utilities for the final Nested Logit Model are also the same as those previously stated for the CLM, with the variables as defined previously in Table 5.1.

Computations for the nested logit model were performed using NLOGIT 3.0 (Greene, 2003). In order to gain convergence, price was scaled by dividing by 5 so that it varied between 0 and 1 like the dummy variables present in the model. It is important to note that in the forthcoming table of results, scaling was restored to the original.

5.5 The Mixed Logit Model

The mixed logit model is an additional alternative to both the CLM and the nested logit model, as it does not have the IIA property. A mixed logit model is a random coefficient model, and when modeling choice experiments allows for consumer heterogeneity which Hensher, Rose, and Greene (2005) note gives valuable additional information about consumers. The basics of mixed logit models are reviewed here. For more detailed information see Hensher et al. (2005) as well as Train (2009). Mixed logit models have been used before to analyze CE

data in closely related topics (see Bond, Thilmany, and Bond, 2008; Hu, Woods, and Bastin, 2009; Yue and Tong, 2009).

The general utility equations for the mixed logit model are:

$$U_{jtq} = \sum_{k=1}^{K} \beta_{qk} x_{jtqk} + \varepsilon_{jtq} = \boldsymbol{\beta}'_q x_{jtq} + \varepsilon_{jtq}$$

(9)

where j = 1, 2, 3, and 4, which represent the J choices State Program, Local, Non-Local, and No Purchase respectively. The index $t = 1,\ldots, T$ indicates the T choice sets that the respondents evaluated, and q indicates the q-th respondent of the survey. The index $k = 1,\ldots, K$ indicates the K random components in the set of utility equations. Observed explanatory variables are represented by the vector x_{jtq}. Then the ε_{jtq} are independent and identically distributed (i.i.d.) errors with an extreme value distribution. It is assume that the respondent will choose the alternative with the maximum utility. If the coefficients β_{qk} are constant, then this would be just the conditional logit model. It is assumed however that some or all of the β_{qk} have a random component, making this instead a mixed logit model.

In general it is assumed that:

$$\boldsymbol{\beta}_q = \boldsymbol{\beta} + \boldsymbol{\Delta}\mathbf{z_q} + \boldsymbol{\Gamma}\mathbf{v}_q = \boldsymbol{\beta} + \boldsymbol{\Delta}\mathbf{z_q} + \eta_q$$

(10)

or $\beta_{qk} = \beta + \delta'_k z_q + \eta_{qk}$ where η_{qk} is a random term whose distribution over individuals depends in general on underlying parameters and $\boldsymbol{\Delta}\mathbf{z_q}$ is observed data, $\mathbf{v}_q$ is a vector of uncorrelated variables with known variances on the diagonal of a variance-covariance matrix, ρ, and Γ is a lower triangular matrix. Since $\text{var}[\beta_q] = \Gamma\rho_q\Gamma'$, this allows for free variances and correlations of the parameters. The distribution of $\mathbf{v}_q$ is not necessarily normal but may be for instance triangular (tent) or uniform. However, here it will be assumed to be normal. It is difficult to

understand this description without examples. In the discussion below it will be applied to our specific situation.

5.6 Mixed Logit Model, Tomatoes

Initially it was assumed as above that all terms in the model had a random component. However, this was simply too complex and the model failed to converge. To simplify it was assumed that all terms involving a state were fixed so that each state caused fixed deviations from possibly random terms. Testing showed only the terms for local, non-local and organic had a significant random component. The no purchase term was assumed to be random so that all the choice terms were random though the test for the no purchase term was not significant. The design allowed for an organic by venue interaction. However, a likelihood ratio test for this interaction was not significant and it was dropped from the model. It was assumed that the random effects of organic, local, non-local and no purchase were not correlated. Thus the first four coefficients, β_1, β_2, β_3 and β_4 are random. Specifically they are independent normally distributed with means μ_1, μ_2, μ_3 and μ_4 along with standard deviations σ_1, σ_2, σ_3 and σ_4 respectively.

The utility equations of the final model (excluding the random term ε_{jtq}) are:

$$
\begin{aligned}
U(\text{State Program}) = {} & \beta_5 \text{FarmMkt}_{tq} + \beta_6 \text{Price}_{tq} + \beta_7 \text{Price}_{tq}^2 + \beta_8 \text{Price}_{tq}\text{FarmMkt}_{tq} + \beta_9 \text{NJ}_{tq}\text{FarmMkt}_{tq} \\
& + \beta_{10}\text{NJ}_{tq}\text{Price}_{tq} + \beta_{11}\text{NJ}_{tq}\text{Price}_{tq}^2 + \beta_{12}\text{NJ}_{tq}\text{Price}_{tq}\text{FarmMkt}_{tq} + \beta_{13}\text{MD}_{tq}\text{FarmMkt}_{tq} \\
& + \beta_{14}\text{MD}_{tq}\text{Price}_{tq} + \beta_{15}\text{MD}_{tq}\text{Price}_{tq}^2 + \beta_{16}\text{MD}_{tq}\text{Price}_{tq}\text{FarmMkt}_{tq} + \beta_{17}\text{PA}_{tq}\text{FarmMkt}_{tq} \\
& + \beta_{18}\text{PA}_{tq}\text{Price}_{tq} + \beta_{19}\text{PA}_{tq}\text{Price}_{tq}^2 + \beta_{20}\text{PA}_{tq}\text{Price}_{tq}\text{FarmMkt}_{tq} + \beta_{21}\text{VA}_{tq}\text{FarmMkt}_{tq} \\
& + \beta_{22}\text{VA}_{tq}\text{Price}_{tq} + \beta_{23}\text{VA}_{tq}\text{Price}_{tq}^2 + \beta_{24}\text{VA}_{tq}\text{Price}_{tq}\text{FarmMkt}_{tq} + \beta_1 \text{Organic}_{tq} \\
& + \beta_{25}\text{NJ}_{tq}\text{Organic}_{tq} + \beta_{26}\text{MD}_{tq}\text{Organic}_{tq} + \beta_{27}\text{PA}_{tq}\text{Organic}_{tq} + \beta_{28}\text{VA}_{tq}\text{Organic}_{tq}
\end{aligned}
$$

$$
\begin{aligned}
U(\text{Local}) = {} & \beta_5 \text{FarmMkt}_{tq} + \beta_6 \text{Price}_{tq} + \beta_7 \text{Price}_{tq}^2 + \beta_8 \text{Price}_{tq} \text{FarmMkt}_{tq} + \beta_9 \text{NJ}_{tq} \text{FarmMkt}_{tq} \\
& + \beta_{10} \text{NJ}_{tq} \text{Price}_{tq} + \beta_{11} \text{NJ}_{tq} \text{Price}_{tq}^2 + \beta_{12} \text{NJ}_{tq} \text{Price}_{tq} \text{FarmMkt}_{tq} + \beta_{13} \text{MD}_{tq} \text{FarmMkt}_{tq} \\
& + \beta_{14} \text{MD}_{tq} \text{Price}_{tq} + \beta_{15} \text{MD}_{tq} \text{Price}_{tq}^2 + \beta_{16} \text{MD}_{tq} \text{Price}_{tq} \text{FarmMkt}_{tq} + \beta_{17} \text{PA}_{tq} \text{FarmMkt}_{tq} \\
& + \beta_{18} \text{PA}_{tq} \text{Price}_{tq} + \beta_{19} \text{PA}_{tq} \text{Price}_{tq}^2 + \beta_{20} \text{PA}_{tq} \text{Price}_{tq} \text{FarmMkt}_{tq} + \beta_{21} \text{VA}_{tq} \text{FarmMkt}_{tq} \\
& + \beta_{22} \text{VA}_{tq} \text{Price}_{tq} + \beta_{23} \text{VA}_{tq} \text{Price}_{tq}^2 + \beta_{24} \text{VA}_{tq} \text{Price}_{tq} \text{FarmMkt}_{tq} + \beta_1 \text{Organic}_{tq} \\
& + \beta_{25} \text{NJ}_{tq} \text{Organic}_{tq} + \beta_{26} \text{MD}_{tq} \text{Organic}_{tq} + \beta_{27} \text{PA}_{tq} \text{Organic}_{tq} + \beta_{28} \text{VA}_{tq} \text{Organic}_{tq} \\
& + \beta_2 \text{Local}_{tq} + \beta_{29} \text{NJ}_{tq} \text{Local}_{tq} + \beta_{30} \text{NJ}_{tq} \text{Local}_{tq} + \beta_{31} \text{NJ}_{tq} \text{Local}_{tq} + \beta_{32} \text{NJ}_{tq} \text{Local}_{tq}
\end{aligned}
$$

$$
\begin{aligned}
U(\text{Non–Local}) = {} & \beta_5 \text{FarmMkt}_{tq} + \beta_6 \text{Price}_{tq} + \beta_7 \text{Price}_{tq}^2 + \beta_8 \text{Price}_{tq} \text{FarmMkt}_{tq} + \beta_9 \text{NJ}_{tq} \text{FarmMkt}_{tq} \\
& + \beta_{10} \text{NJ}_{tq} \text{Price}_{tq} + \beta_{11} \text{NJ}_{tq} \text{Price}_{tq}^2 + \beta_{12} \text{NJ}_{tq} \text{Price}_{tq} \text{FarmMkt}_{tq} + \beta_{13} \text{MD}_{tq} \text{FarmMkt}_{tq} \\
& + \beta_{14} \text{MD}_{tq} \text{Price}_{tq} + \beta_{15} \text{MD}_{tq} \text{Price}_{tq}^2 + \beta_{16} \text{MD}_{tq} \text{Price}_{tq} \text{FarmMkt}_{tq} + \beta_{17} \text{PA}_{tq} \text{FarmMkt}_{tq} \\
& + \beta_{18} \text{PA}_{tq} \text{Price}_{tq} + \beta_{19} \text{PA}_{tq} \text{Price}_{tq}^2 + \beta_{20} \text{PA}_{tq} \text{Price}_{tq} \text{FarmMkt}_{tq} + \beta_{21} \text{VA}_{tq} \text{FarmMkt}_{tq} \\
& + \beta_{22} \text{VA}_{tq} \text{Price}_{tq} + \beta_{23} \text{VA}_{tq} \text{Price}_{tq}^2 + \beta_{24} \text{VA}_{tq} \text{Price}_{tq} \text{FarmMkt}_{tq} + \beta_1 \text{Organic}_{tq} \\
& + \beta_{25} \text{NJ}_{tq} \text{Organic}_{tq} + \beta_{26} \text{MD}_{tq} \text{Organic}_{tq} + \beta_{27} \text{PA}_{tq} \text{Organic}_{tq} + \beta_{28} \text{VA}_{tq} \text{Organic}_{tq} \\
& + \beta_3 \text{NonLocal}_{tq} + \beta_{33} \text{NJ}_{tq} \text{NonLocal}_{tq} + \beta_{34} \text{NJ}_{tq} \text{NonLocal}_{tq} + \beta_{35} \text{NJ}_{tq} \text{NonLocal}_{tq} \\
& + \beta_{36} \text{NJ}_{tq} \text{NonLocal}_{tq}
\end{aligned}
$$

$$
U(\text{No Purchase}) = \beta_4 \text{NoPurchase}_{tq}
$$

(11-14)

Changes in the constant part of the coefficients are confined to the presence or absence of groups of coefficients (e.g., Some coefficients are only present in the expression for the utility of the choice locally grown). The variables are as defined in Table 5.2.

Table 5.2 Variable Names and Descriptions, Mixed Logit Model

Variable Name	Description
Local	1 if the respondent selected the Local choice option[1]
NonLocal	1 if the respondent selected the Non-Local choice option[1]
NoPurchase	1 if the respondent selected the No Purchase choice option[1]
FarmMkt	1 if the respondent chose the farmers' market venue[1]
Price	Price for one quart of medium-sized tomatoes

Organic	1 if the respondent chose the organic attribute[1]
MD	1 if the respondent lived in Maryland
NJ	1 if the respondent lived in New Jersey
PA	1 if the respondent lived in Pennsylvania
VA	1 if the respondent lived in Virginia

[1]Dummy variable where value is zero otherwise

Computations were done using the NLOGIT 3.0 package (Greene, 2003). Computation is carried out using a simulated log-likelihood. This requires the evaluation of certain multi-dimensional integrals for which the most practical method is simulation. However, pure random draws are quite time consuming and the method of Halton draws is used instead. The Halton draws can be modified by adding shuffling which may improve estimates especially for higher dimensions (Train, 2009). This requires a seed to set up the shuffling. Several different seeds were used and it was noted that results agreed to within 2 significant figures. The number of draws chosen for the Halton sequences was 500. See Train (2009) for more information.

5.7 Hypotheses, Strawberry Preserves Models

Prior to the modeling discussed above, hypotheses for both models were made and are discussed below. It is hypothesized that the estimates of the CLM and nested logit will differ, since it is assumed that IIA is a concern with the CLM that the nested logit addresses. Both local and state program versions were expected to be preferred over non-local versions, although the ranking between these two was uncertain, and could possibly vary by state. Some earlier studies discussed suggested state borders may serve as a definition of local for consumers. However, a state marketing program may need to do more than just state identification to match consumer preference for local. State size might also matter, since the larger the state, the greater the chance consumers may view only a portion of the state as being local. Therefore, it is expected that differences between states will be observed across choices.

It is also hypothesized that consumers will be willing to pay a higher price premium for strawberry preserves purchased at a farmers' market versus purchased at a grocery store. The ambiance and experience of visiting a farmers' market, as well as the feeling of a connection with area farmers could help explain this outcome. Onianwa, Mojica, and Wheelock (2006) identified several areas where consumers had a preference for farmers' markets over grocery stores, including the atmosphere. Zepeda and Leviten-Reid (2004) noted similar advantages for farmers' markets, such as being seen as a form of entertainment or chance to interact with area farmers.

It is likewise expected that consumers will exhibit preference and higher mWTP for organic preserve versions versus natural preserve versions. This would make sense given the extra, and generally favorably viewed, requirements organic certification imposes on production. However, while information was included on an information sheet accompanying the survey, it may still be that consumer understanding of the differences between these two attributes is limited, as seen in Gifford and Bernard (2011). If full understanding is lacking, it could be that no significant difference between organic and natural appears.

5.8 Hypotheses, Tomatoes Model

Several hypotheses regarding the variables were made prior to modeling the tomatoes CE data. First, it was assumed that consumers would have a higher WTP for an organic version relative to a conventional version given the extra, and generally favorably viewed, requirements organic imposes on production. However, while information was included on a sheet accompanying the survey, it may still be that consumer understanding of the meaning behind organic could be limited, and often confused with other terms such as natural, as seen in Gifford and Bernard (2011). If full understanding for organic is absent it could be that no significant difference between the two attributes would appear.

Both local and state marketing program labeled versions were expected to have higher WTP than the non-local option. The ranking between these two was uncertain however and considered to possibly vary across the states. While some studies discussed earlier suggested state borders may define local for consumers, a state marketing program may need more than that to match the preference for local. The size of the state may also matter as the larger the state the larger the chance consumers would view only a portion of it as local to them.

It was also hypothesized that consumers will be willing to pay a higher price premium for fresh tomatoes purchased at a farmers' market versus purchased at a grocery store. As previously discussed, the Mid-Atlantic region is home to a wide array of farmers' markets. Although Toler et al. (2009) failed to find an increased WTP for farmers' market locations compared to their grocery store counterparts, their study was conducted in the mid-western region of the country.

Since it can be difficult to understand the relationships between the choices and attributes by examining the coefficients alone, a table of hypotheses on individual coefficients is omitted from this section. Rather probabilities will be computed from the estimated coefficients, which will be discussed further in the following sections.

Section 6
Results, Strawberry Preserves CE

6.1 CLM and Nested Logit Results, Strawberry Preserves

Table 6.1 shows the results of the CLM, and the variables in bold are statistically significant at the 5% level. The variable Local was significant when interacted with both Maryland and Pennsylvania. The variable NonLocal was significant both by itself and when interacted with both Maryland and Pennsylvania. The variables Market, $Price^2$, and the interaction between Price*Market were also significant, as was the variable NoPurchase. Lastly the variable Organic was significant both by itself and when interacted with Maryland.

There was some concern with how to correctly include the choice No Purchase within the CLM, as No Purchase is separate from the other three purchase options present in the design. It was decided to add a constant term to the model in which the term (1-*NoPurchase*) was included for the attribute variables. This type of approach has been explored previously by Haaijer, Kamakura, and Wedel (2001), the benefits of which include a better predictive fit and unbiased estimates for the attributes.

Table 6.2 shows the results of the subsequent nested logit model, and the variables in bold are statistically significant at the 10% level. In terms of significance, all of the variables significant in the CLM were also significant in the nested logit, as well as the interaction between NonLocal and Virginia and Organic and Virginia. The normalization constants for the two branches of the nested logit can also be viewed in Table 6.2. Since not all of the normalization constants are equal to 1, the nested logit model as opposed to the CLM was overall a better fit, as it relaxes the IIA assumption. The nested logit model therefore will be examined from here forward in this section.

Table 6.1. CLM Results, Strawberry Preserves

Variable	Estimated Coefficient	Standard Error	Pr > ChiSq
Local	-0.00653	0.05577	0.9068
MD*Local	0.37054	0.07980	**<.0001**
NJ*Local	-0.13139	0.08142	0.1066
PA*Local	0.20941	0.07861	**0.0077**
VA*Local	0.06784	0.08158	0.4057
NonLocal	-1.28961	0.07421	**<.0001**
MD*NonLocal	0.44309	0.10420	**<.0001**
NJ*NonLocal	-0.09288	0.11066	0.4013
PA*NonLocal	0.27456	0.10357	**0.0080**
VA*NonLocal	0.20127	0.10739	0.0609
NoPurchase	-2.66418	0.53194	**<.0001**
Market	-0.45756	0.13667	**0.0008**
Price*Market	0.09046	0.03749	**0.0158**
Price	0.04969	0.28034	0.8593
$Price^2$	-0.13577	0.03575	**0.0001**
Organic	-0.11226	0.05423	**0.0384**
MD*Organic	0.24377	0.07735	**0.0016**
NJ*Organic	0.04432	0.07967	0.5780
PA*Organic	-0.09850	0.07681	0.1997
VA*Organic	-0.08495	0.07943	0.2849

Note: Variables in bold are significant at the 5% level

Table 6.2. Nested Logit Results, Strawberry Preserves (RU2)

Variable	Estimated Coefficient	Standard Error	Pr > ChiSq
Local	-0.0088	0.0414	0.8318
MD*Local	0.2478	0.0697	**0.0004**
NJ*Local	-0.0946	0.0611	0.1212
PA*Local	0.1293	0.0670	**0.0536**
VA*Local	0.0563	0.0666	0.3980
NonLocal	-0.9030	0.1246	**<.0001**
MD*NonLocal	0.3063	0.0875	**0.0005**
NJ*NonLocal	-0.0456	0.0794	0.5661
PA*NonLocal	0.2107	0.0867	**0.0151**
VA*NonLocal	0.1979	0.0864	**0.0219**
NoPurchase	-2.5286	0.4109	**<.0001**
Market	-0.2886	0.1133	**0.0108**
Price*Market	0.0579	0.0301	**0.0543**
Price	-0.0608	0.2168	0.7794
Price^2	-0.0840	0.0312	**0.0072**
Organic	-0.0808	0.0408	**0.0474**
MD*Organic	0.1259	0.0618	**0.0418**
NJ*Organic	0.0356	0.0584	0.5423
PA*Organic	-0.0012	0.0626	0.9853
VA*Organic	-0.1345	0.0644	**0.0368**
Normalization Constants $\mu(i)$:			
Purchase	0.6877	0.0882	**<.0001**
NoPurchase[1]	1.0000	…….	……

[1]Normalization constants for a branch with one choice are fixed at 1.
Note: Variables in bold are significant at the 10% level

It can be difficult to understand all the relationships between the choices by examining the coefficients. Graphical representations can make these more apparent. Using the probabilities for the choices calculated from the coefficients in Table 6.2, graphs were created by state for the probability of each choice by price, for both purchasing venues and both production methods.

Figures 6.1a-1e show the probabilities of each choice by price for the natural attribute and farmers' market purchasing venue, for all five states respectively. As will be seen, the natural, farmers' market combination held the highest value for consumers across all five states. Figures 6.2a-2e show the probabilities of each choice by price for the natural attribute and grocery store purchasing venue, for each state. Figures 6.3a-3e show the probabilities of each choice by price for the organic attribute, farmers' market venue, and Figures 6.4a-4e similarly shows choice by price for the organic attribute, grocery store venue, again by state. As can be seen, the graphs across combinations did not show any unique differences. However, there were some apparent differences between states.

As hypothesized, local and state program preserves were clearly preferred over non-local preserves across all five states. The two former choices were typically the preference of over 35% of consumers for each, with non-local the choice of only around 20% of consumers, across most price levels. Differences between states include the probability ranking between local and state program. As can be seen in Figures 6.1c, 6.2c, 6.3c, and 6.4c, New Jersey was the only state with respondents exhibiting a stronger preference for preserves identified under a state program over those identified as local. This preference order was consistent across purchasing venues and production methods. While not quite significantly different at the 10% level, these results do suggest that the *Jersey Fresh* program, one of the most established and longest-running programs, has been able to successfully attract consumers and be competitive against the generic concept of local.

Delaware however was the only state where little preference difference is shown between preserves identified as local and those identified with *Grown Fresh with Care in Delaware*, across purchasing venues and production methods. As displayed in Figures 6.1a, 6.2a, 6.3a, and 6.4a, the probabilities for the two choices were virtually indistinguishable across all price levels. Delaware's now discontinued program was therefore unable to gain a higher preference rating over local, although it was able to reach an even level. It is an open question whether further promotion and increased effort would have been able to create the preference difference seen for state program preserves that was witnessed for *Jersey Fresh*.

For Maryland, Pennsylvania, and Virginia, respondents exhibited a stronger preference for preserves identified as local compared to those identified under each states' marketing program. As with the other states, these relationships held across both purchasing venues and production methods. Pennsylvania as a state was a near average of the probabilities for Maryland and Virginia, where the consumer probability of purchase for local compared to state program preserves was concerned. Maryland had the greatest probability of purchase for local compared to state program, while Virginia had the smallest of the three states, and was not significantly different. The benefits of these state programs relative to their costs should likely be carefully considered by state policy makers. Virginia was perhaps the largest surprise in that like New Jersey, its state program has been in establishment since the 1980's. Other factors, such as program funding and promotional effort, could likely account for some of the differences between these two older programs.

Respondents from Maryland, Pennsylvania and Virginia also exhibited a smaller preference difference between state program and non-local preserves relative to Delaware, again across both purchasing venues and production methods. This preference difference between state program and non-local was smallest for respondents from Maryland. This result indicates an additional challenge for state programs in these three states, who will likely find it more difficult to gain consumer preference for state program promoted foods.

Another key element in the aforementioned comparisons may be the geographical size of each state. As previously hypothesized, the larger the state, the more likely consumers may view only a portion of their state to be local, and the more difficult it may be for state programs to compete with local on just state recognition alone. The two state programs that faired the best in comparison to local, which were Delaware and New Jersey, also happened to be the two smallest of the five.

Figures 6.1a.-6.1e. Probability of Choice by Price for Strawberry Preserves; Natural and Farmers' Market Attributes

Figure 6.la. Delaware

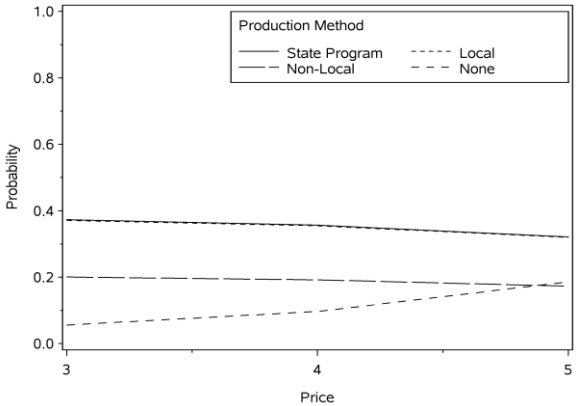


Figure 6.1b. Maryland

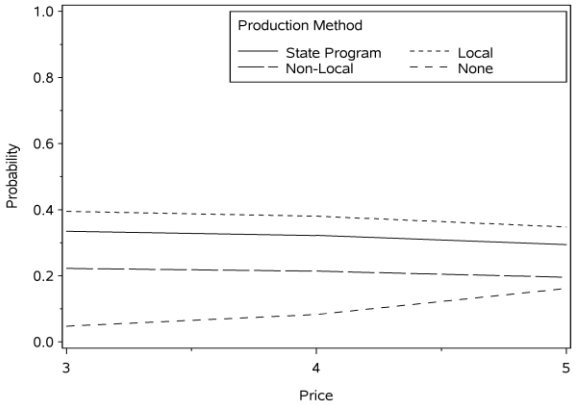


Figure 6.1c. New Jersey

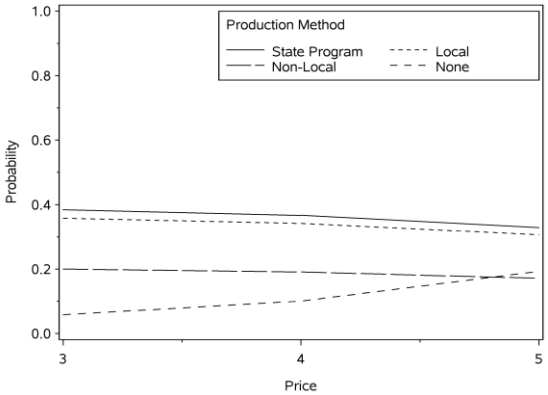


Figure 6.1d. Pennsylvania

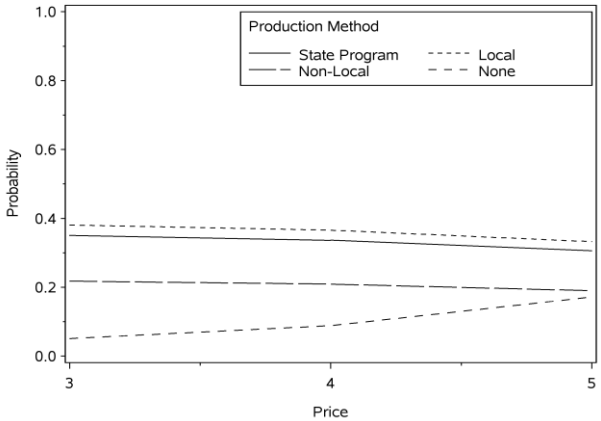
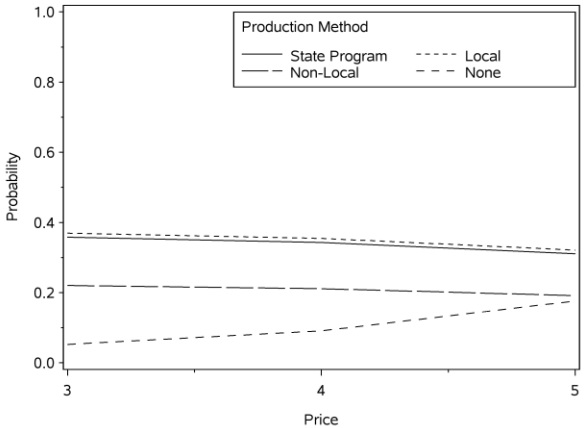


Figure 6.1e. Virginia



Figures 6.2a-6.2e. Probability of Choice by Price for Strawberry Preserves; Natural and Grocery Store Attributes

Figure 6.2a. Delaware

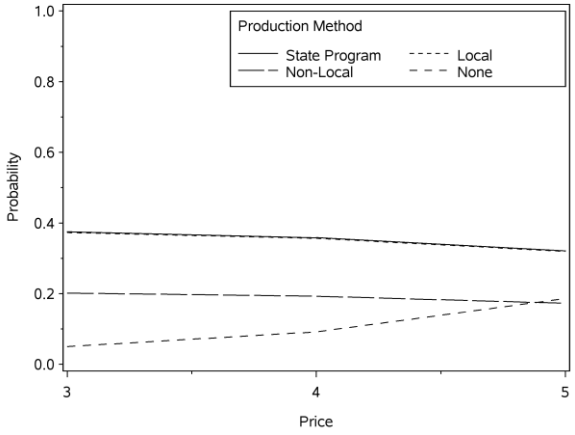


Figure 6.2b. Maryland

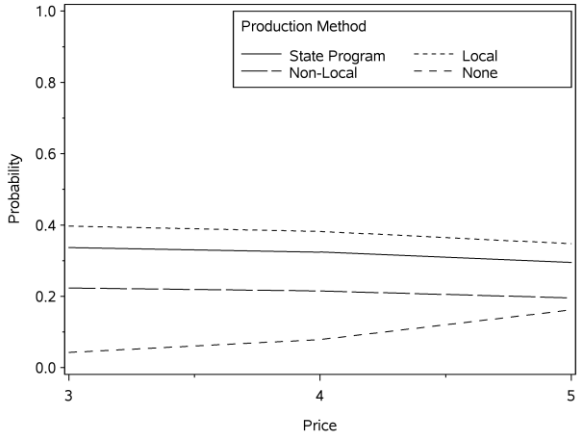


Figure 6.2c. New Jersey

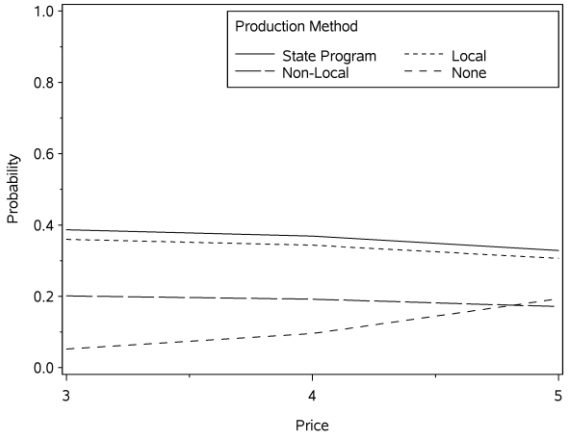


Figure 6.2d. Pennsylvania

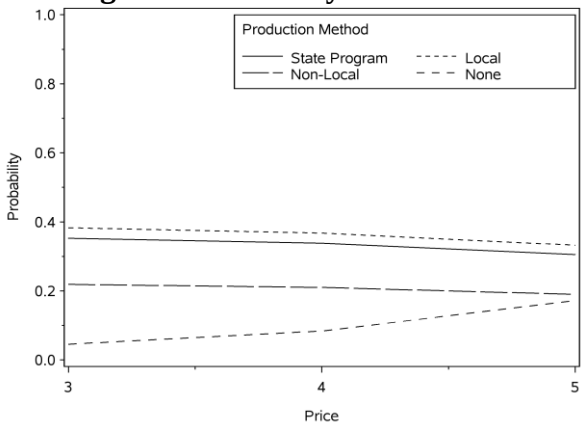
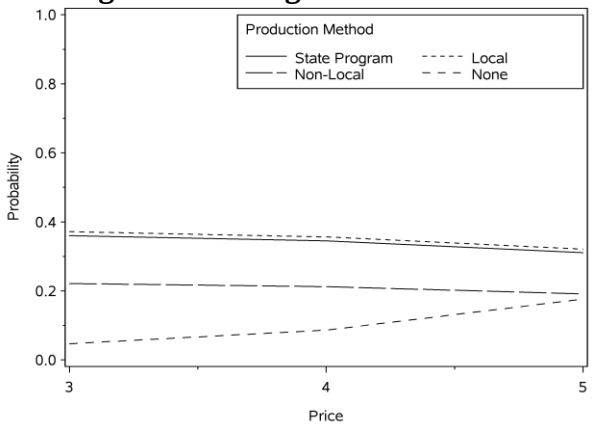


Figure 6.2e. Virginia



Figures 6.3a-6.3e. Probability of Choice by Price for Strawberry Preserves; Organic and Farmers' Market Attributes

Figure 6.3a. Delaware

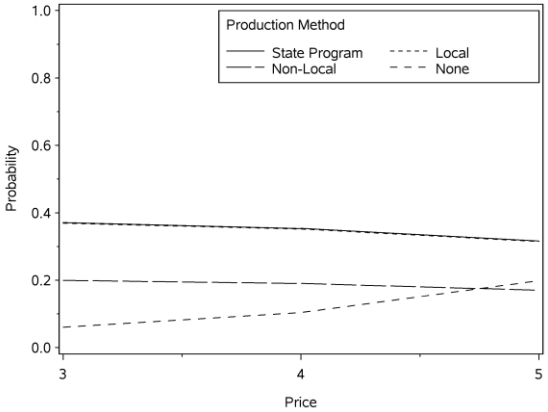


Figure 6.3b. Maryland

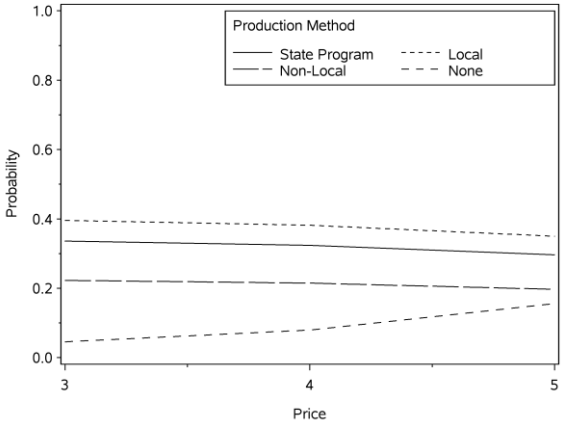


Figure 6.3c. New Jersey

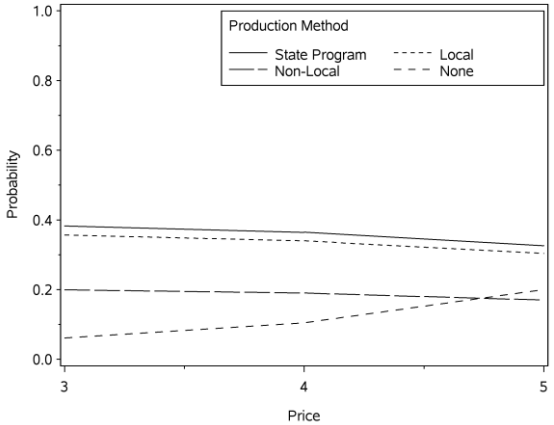


Figure 6.3d. Pennsylvania

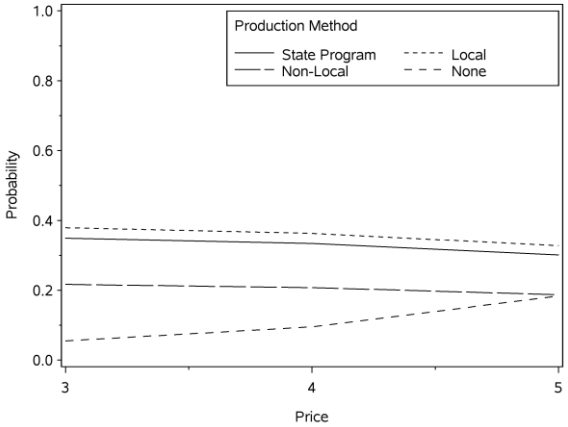
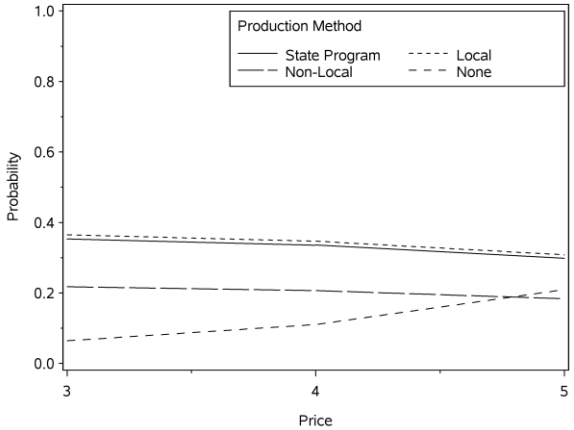


Figure 6.3e. Virginia



Figures 6.4a-6.4e. Probability of Choice by Price for Strawberry Preserves; Organic and Grocery Store Attributes

Figure 6.4a. Delaware

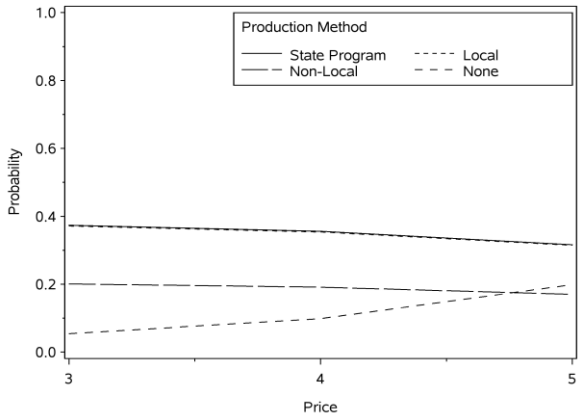


Figure 6.4b. Maryland

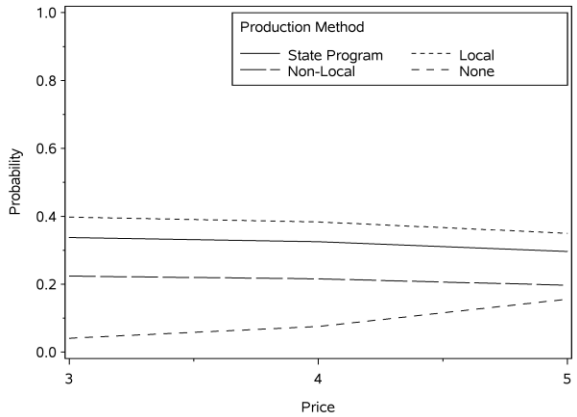


Figure 6.4c. New Jersey

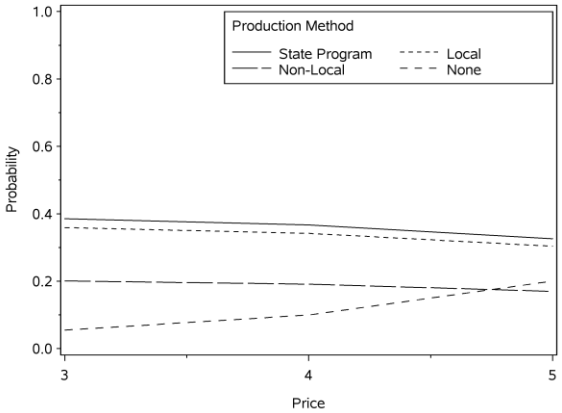


Figure 6.4d. Pennsylvania

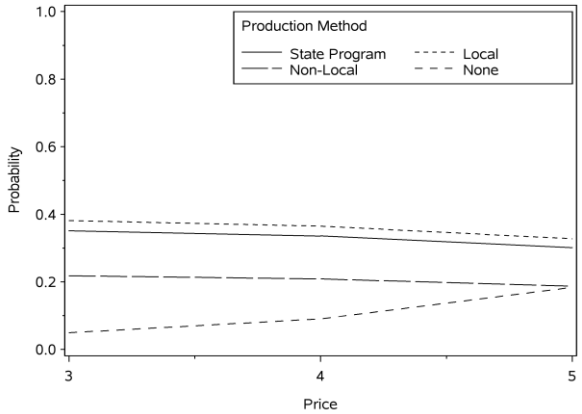
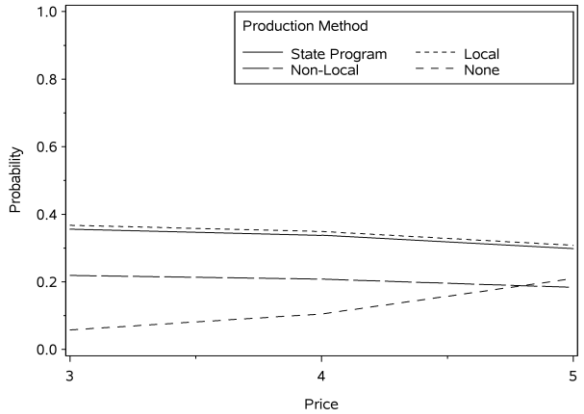


Figure 6.4e. Virginia



There has been some evidence that consumers may consider local to be an area smaller than just within a state's borders, such as a state county for example. Hu et al. (2010) suggested many consumers may define local to mean within less than 100 miles, and Brown (2003) found in Missouri that local was often viewed as a region smaller than within a state's border. Local may come across as more supportive of a consumer's area than a state-wide promotion for larger states would. Therefore, it may take additional effort for promotional programs in Maryland, Pennsylvania, and Virginia to effectively capture the local consumer.

The remaining elements of the probability graphs were more consistent. The probability of choosing the No Purchase option was less than 5% at the lowest price level for all cases shown. As expected, the probability of a no purchase did increase as price increases. By the time the upper price limit of five dollars was reached, the percentage of respondents selecting no purchase was consistently near 20%. For New Jersey and Delaware, the no purchase option even surpassed the option of purchasing non-local preserves. One reason for this occurrence may be that at those price levels, consumers in those states are expecting something extra from the product, such as being local.

6.2 Determining mWTP

When price and the effect for which willingness to pay is desired both have linear functional forms, the marginal willingness to pay (mWTP) is:

$$-\beta_{\text{effect}} / \beta_{\text{price}} .$$

(15)

This is the price increase needed to keep the utility of the good the same after a unit increase in effect. This mWTP depends neither on the current price nor the current level of effect. If price happens to have a quadratic functional form, as seen here, more care must be taken. In the

expression for utility let β_{price} and β_{price^2} be the coefficients for *Price* and *Price*^{2} respectively. Let C be the current price and let Δu be the change in utility caused by the changes in the other attribute. (This may be a unit change in a continuous attribute or perhaps a change from one level of a dummy variable to the other). The mWTP is the price change needed to equalize the utilities, and is a solution to the equation:

$$(\beta_{\text{price}}(C+\text{WTP})+\beta_{\text{price}^2}(C+\text{WTP})^2)-(\beta_{\text{price}}C+\beta_{\text{price}^2}C^2)=-\Delta u \quad .$$

(16)

This can be rewritten as the quadratic equation:

$$a\,\text{WTP}^2+b\,\text{WTP}+c=0$$

(17)

where $a=\beta_{\text{price}^2}$, $b=\beta_{\text{price}}+2C\beta_{\text{price}^2}$, and $c=\Delta u$. The quadratic formula gives:

$$m\,\text{WTP}=\frac{-b\pm\sqrt{b^2-4ac}}{2a} \quad .$$

(18)

Additionally, the mWTP equation can be written using the quadratic formula as:

$$mWTP=\frac{-(\beta_{13}+\beta_{14}+2\beta_{15}P_j)\pm\sqrt{(\beta_{13}+\beta_{14}+2\beta_{15}P_j)^2-4\beta_{15}U}}{2\beta_{15}} \quad .$$

(19)

where P_j is the price per jar of strawberry preserves, j= \$3.00, \$4.00 or \$5.00, and U is the calculated gain in utility determined by the coefficient estimates.

In the nested logit model, both β_{price} and β_{price^2} are negative. This implies that the desired solution is the one with the minus sign, as solutions with the positive sign before the terms are infeasible and therefore ignored. A table of computed mWTP values can be seen in Table 6.3. Quadratic functional forms such as this and mWTP have been considered before (see Roe et al., 2004).

The mWTP estimates in Table 6.3 show the different price amount a consumer would be willing to pay from the base price for the change in the given attribute. As expected, these mWTP estimates decline as the base price increases. For example, consider the mWTP to switch from non-local preserves to state program preserves, grocery store purchasing venue, for Delaware. At a base price of $3, the Delaware consumer would be willing to pay $1.33 more for this change, but is only willing to pay $0.90 more if the base price is $5. The proceedings below discuss these mWTP estimates in more detail.

6.3 mWTP Estimates, Grocery Store vs. Farmers' Market

Overall, the calculated mWTP estimates indicate a higher willingness-to-pay across all five states for preserves from the farmers' market purchasing venue, compared to the grocery store purchasing venue. Consumers appear willing to pay a price premium for preserves from a farmers' market location, as was earlier hypothesized. Possible explanations for this higher mWTP could be the ambiance of the farmers' market, as well as the ability to personally interact with local farmers. As previously discussed, prior research involving farmers' markets uncovered some intangible benefits to shopping at farmers' market venues (See Zepeda and Leviten-Reid, 2004, and Onianwa, Mojica, and Wheelock, 2006).

6.4 mWTP Estimates, Organic vs. Natural

With the exception of Maryland, all of the states surveyed failed to exhibit a higher mWTP for organic preserves compared to natural preserves. This finding was unexpected, as the opposite was earlier hypothesized. For the organic attribute, grocery store purchasing venue, Maryland respondents exhibited a mWTP of 2.7% more for preserves priced at $3.00, a mWTP of 1.5% more for preserves priced at $4.00, and a mWTP of 1% more for preserves priced at $5.00. For the organic attribute, farmers' market purchasing venue, Maryland respondents exhibited a mWTP of 3% more for preserves priced at $3.00, a mWTP of 1.8% more for preserves priced at $4.00, and a mWTP of 1% more for preserves priced at $5.00. While the price premium for organic was evident in Maryland, even here it was not especially high.

For Delaware, the attributes of natural and organic appear to be viewed about the same by consumers. This result seems to follow the earlier findings of Gifford and Bernard (2011), in that consumers cannot distinguish differences between these two. For Pennsylvania and Virginia respondents, the results of why natural was preferred over organic are more difficult to explain. Perhaps consumers simply prefer the more familiar natural product, or fail to see the advantage of buying an organic processed product. Or, even though an information sheet was included with the survey, they may still be confused as to the meanings of these two terms. Further investigation comparing these two attributes is needed.

Table 6.3. Marginal WTP by State and Price Level, Strawberry Preserves

	Delaware Price			Maryland Price			New Jersey Price			Pennsylvania Price			Virginia Price		
	$3.00	**$4.00**	**$5.00**	**$3.00**	**$4.00**	**$5.00**	**$3.00**	**$4.00**	**$5.00**	**$3.00**	**$4.00**	**$5.00**	**$3.00**	**$4.00**	**$5.00**
Grocery Store Purchasing Venue:															
Non-Local to State Program	1.33	1.10	0.90	0.93	0.75	0.63	1.39	1.15	0.97	1.06	0.86	0.72	1.08	0.88	0.73
Non-Local to Local	1.32	1.09	0.92	1.25	1.02	0.86	1.26	1.03	0.87	1.22	1.00	0.84	1.14	0.93	0.78
Local to State Program	0.02	0.02	0.01	-0.45	-0.34	-0.27	0.18	0.14	0.11	-0.22	-0.17	-0.14	-0.09	-0.07	-0.05
Natural to Organic	-0.02	-0.01	-0.01	0.08	0.06	0.05	-0.08	-0.06	-0.05	-0.15	-0.11	-0.09	-0.41	-0.31	-0.25
Farmers' Market Purchasing Venue:															
Non-Local to State Program	1.44	1.17	0.98	1.01	0.80	0.66	1.50	1.22	1.02	1.15	0.92	0.76	1.17	0.94	0.78
Non-Local to Local	1.43	1.16	0.97	1.35	1.09	0.91	1.36	1.10	0.92	1.32	1.06	0.89	1.23	0.99	0.83
Local to State Program	0.02	0.01	0.01	-0.52	-0.37	-0.29	0.20	0.15	0.12	-0.25	-0.18	-0.15	-0.10	-0.07	-0.06
Natural to Organic	-0.02	-0.01	-0.01	0.09	0.07	0.05	-0.09	-0.07	-0.05	-0.17	-0.12	-0.10	-0.46	-0.33	-0.26

6.5 mWTP Estimates, Local, Non-Local, and State Program Promoted

The mWTP estimates comparing local, non-local and state program promoted followed the earlier results examining the probabilities for these choices. Across all states, there was clearly a higher mWTP for the attributes local and state program over non-local, as was earlier hypothesized.

In Delaware, only negligibly higher mWTP estimates of $0.02, $0.01 and $0.01 are exhibited for preserves identified with the *Grown Fresh with Care in Delaware* slogan over preserves identified as local, for both purchasing venues. With Delaware respondents exhibiting a mWTP of only 0.67% more for state program preserves over local preserves priced at $3.00, for both purchasing venues, evidence in support of the program is not found. As Delaware's state marketing program was discontinued in early 2010, this decision would have been more than feasible looking at these estimates.

For the local attribute, grocery store purchasing venue, Delaware respondents exhibited a mWTP of 44% more for preserves priced at $3.00, a mWTP of 27.3% more for preserves priced at $4.00, and a mWTP of 18.4% more for preserves price at $5.00, compared to non-local preserves. For the local attribute, farmers' market purchasing venue, Delaware respondents exhibited a mWTP of 47.7% more for preserves priced at $3.00, a mWTP of 29% more for preserves priced at $4.00, and a mWTP of 19.4% more for preserves priced at $5.00, compared to non-local preserves.

Respondents in Maryland, Pennsylvania and Virginia all exhibited a higher mWTP for preserves identified as local compared to their state's marketing slogan, as well as compared to non-local preserves. As hypothesized, perhaps consumers in larger states such as these three fail to define local as within the borders of their state.

For the local attribute, grocery store purchasing venue, Maryland respondents exhibited a mWTP of 41.7% more for preserves priced at $3.00, a mWTP of 25.5% more for

preserves priced at $4.00, and a mWTP of 17.2% more for preserves price at $5.00, compared to non-local preserves. For the local attribute, farmers' market purchasing venue, Maryland respondents exhibited a mWTP of 45% more for preserves priced at $3.00, a mWTP of 27.3% more for preserves priced at $4.00, and a mWTP of 18.2% more for preserves priced at $5.00, compared to non-local preserves. Even though Maryland exhibited the lowest mWTP to move from local to non-local preserves, consumers were still willing to pay a premium of over 40% for preserves priced at $3.00.

Compared to local, for state program promoted, Maryland respondents exhibited a mWTP of 15% less for preserves priced at $3.00, a mWTP of 8.5% less for preserves priced at $4.00 and a mWTP of 5.4% less for preserves priced at $5.00, for the grocery store purchasing venue. For the farmers' market purchasing venue, Maryland respondents exhibited a mWTP of 17.3% less for preserves priced at $3.00, a mWTP of 9.3% less for preserves priced at $4.00 and a mWTP of 5.8% less for preserves priced at $5.00, for state program over local.

For the local attribute, grocery store purchasing venue, Pennsylvania respondents exhibited a mWTP of 40.7% more for preserves priced at $3.00, a mWTP of 25% more for preserves priced at $4.00, and a mWTP of 16.8% more for preserves price at $5.00, compared to non-local preserves. For the local attribute, farmers' market purchasing venue, Pennsylvania respondents exhibited a mWTP of 44% more for preserves priced at $3.00, a mWTP of 26.5% more for preserves priced at $4.00, and a mWTP of 22.3% more for preserves priced at $5.00, compared to non-local preserves.

Comparing state program to local, Pennsylvania respondents exhibited a mWTP of 7.3% less for preserves priced at $3.00, a mWTP of 4.3% less for preserves priced at $4.00 and a mWTP of 2.8% less for preserves priced at $5.00, for the grocery store purchasing venue. For the farmers' market purchasing venue, Pennsylvania respondents exhibited a mWTP of 8.3% less for preserves priced at $3.00, a mWTP of 4.5% less for preserves priced at $4.00 and a mWTP of 3% less for preserves priced at $5.00, again for state program over local.

For the local attribute, grocery store purchasing venue, Virginia respondents exhibited a mWTP of 38% more for preserves priced at $3.00, a mWTP of 23.3% more for preserves priced at $4.00, and a mWTP of 15.6% more for preserves price at $5.00, compared to non-local preserves. For the local attribute, farmers' market purchasing venue, Virginia respondents exhibited a mWTP of 41% more for preserves priced at $3.00, a mWTP of 24.8% more for preserves priced at $4.00, and a mWTP of 16.6% more for preserves priced at $5.00, compared to non-local preserves.

Lastly comparing mWTP for state program over local for Virginia, respondents exhibited a mWTP of 3% less for preserves priced at $3.00, a mWTP of 1.8% less for preserves priced at $4.00 and a mWTP of 1% less for preserves priced at $5.00, for the grocery store purchasing venue. For the farmers' market purchasing venue, Virginia respondents exhibited a mWTP of 3.3% less for preserves priced at $3.00, a mWTP of 1.8% less for preserves priced at $4.00 and a mWTP of 1.2% less for preserves priced at $5.00 for state program over local. Considering that Virginia's state marketing program *Virginia's Finest* has been in existence since the late 1980's, it was somewhat surprising to see that local was preferred over state program.

New Jersey was the only state with respondents clearly exhibiting a higher mWTP for preserves identified with the *Jersey Fresh* slogan compared to preserves identified as local or non-local, for both purchasing venues. In New Jersey, mWTP estimates of $0.18, $0.14 and $0.11 were exhibited for *Jersey Fresh* preserves over local preserves for the grocery store purchasing venue, with slightly higher estimates of $0.20, $0.15 and $0.12 for the farmers' market venue. In other words, for state program over local, New Jersey respondents exhibited a mWTP of 6% more for preserves priced at $3.00, a mWTP of 3.5% more for preserves priced at $4.00, and a mWTP of 2.2% more for preserves priced at $5.00, grocery store purchasing venue.

For the farmers' market purchasing venue, New Jersey respondents exhibited a mWTP of 6.7% more for preserves priced at $3.00, a mWTP of 3.8% more for preserves priced

at $4.00 and a mWTP of 2.4% more for preserves priced at $5.00 for state program over local. For the state program promoted attribute, grocery store purchasing venue, New Jersey respondents exhibited a mWTP of 46.3% more for preserves priced at $3.00, a mWTP of 28.8% more for preserves priced at $4.00, and a mWTP of 19.4% more for preserves price at $5.00, compared to non-local preserves. For the local attribute, farmers' market purchasing venue, New Jersey respondents exhibited a mWTP of 50% more for preserves priced at $3.00, a mWTP of 30.5% more for preserves priced at $4.00, and a mWTP of 20.4% more for preserves priced at $5.00, compared to non-local preserves. Considering that *Jersey Fresh* is one of the most well known state programs in the country, that state program was preferred over local was not a surprising result.

Section 7
RESULTS, TOMATOES CE

7.1 Mixed Logit Model Results, Tomatoes

Results from the mixed logit model can be viewed in Table 7.1, and show the attributes organic, local, and non-local having a significant effect on the probability of choice for fresh tomatoes. *Price* and *Price*^{2} also are exhibited having a significant effect on the probability of choice, following with standard economic theory. For Maryland, Pennsylvania and Virginia, state interactions with *Local* and *NonLocal* are exhibited as having a positive, significant effect on probability of choice.

Table 7.1. Mixed Logit Model Results, Tomatoes*

Variable	Coefficient	Standard Error	z-statistic	P-value
	Means of Random parameters in utility functions			
Organic	**-0.2378**	**0.0844**	**-2.818**	**0.0048**
Local	**-0.2264**	**0.0797**	**-2.842**	**0.0045**
NonLocal	**-2.2593**	**0.2200**	**-10.268**	**<0.0001**
NoPurchase	-0.0114	0.7915	-0.014	0.9885
	Nonrandom parameters in utility functions			
FarmMkt	-0.6460	0.3815	-1.693	0.0904
Price	**2.3739**	**0.4142**	**5.732**	**<0.0001**
Price^2	**-0.4527**	**0.2750**	**-8.231**	**<0.0001**
Price*FarmMkt	0.1604	0.0989	1.622	0.1048
NJ*FarmMkt	-0.0957	0.5704	-0.168	0.8667
NJ*Price	-0.2113	0.1288	-1.640	0.1010
NJ*Price^2	0.0223	0.0277	0.805	0.4206
NJ*Price*FarmMkt	0.1268	0.1483	0.855	0.3926

MD*FarmMkt	-0.3557	0.6212	-0.573	0.5669
MD*Price	-0.0958	0.1396	-0.686	0.4928
MD*Price^2	-0.0255	0.0304	-0.841	0.4004
MD*Price*FarmMkt	0.1544	0.1639	0.942	0.3459
PA*FarmMkt	1.0211	0.6180	1.652	0.0985
PA*Price	**-0.4864**	**0.1378**	**-3.530**	**0.0004**
PA*Price^2	**0.0659**	**0.0295**	**2.232**	**0.0256**
PA*Price*FarmMkt	-0.2256	0.1620	-1.392	0.1639
VA*FarmMkt	**1.2429**	**0.6294**	**1.975**	**0.0483**
VA*Price	**-0.4148**	**0.1363**	**-3.043**	**0.0023**
VA*Price^2	0.0362	0.0295	1.225	0.2205
VA*Price*FarmMkt	**-0.3550**	**0.1679**	**-2.114**	**0.0345**
NJ*Organic	-0.0205	0.1240	-0.166	0.8684
MD*Organic	**0.3757**	**0.1332**	**2.821**	**0.0048**
PA*Organic	-0.0471	0.1334	-0.353	0.7243
VA*Organic	-0.0187	0.1330	-0.141	0.8880
NJ*Local	-0.0784	0.1139	-0.688	0.4912
MD*Local	**0.5327**	**0.1287**	**4.139**	**<0.0001**
PA*Local	**0.5134**	**0.1269**	**4.045**	**0.0001**
VA*Local	**0.5194**	**0.1327**	**3.915**	**0.0001**
NJ*NonLocal	-0.2051	0.1551	-1.322	0.1860
MD*NonLocal	**0.3971**	**0.1635**	**2.429**	**0.0151**
PA*NonLocal	**0.4936**	**0.1653**	**2.986**	**0.0028**
VA*NonLocal	**0.8378**	**0.1710**	**4.898**	**<0.0001**
Derived standard deviations of parameter distributions				
Organic	**1.6099**	**0.1600**	**10.065**	**<0.0001**
Local	**1.2607**	**0.1888**	**6.679**	**<0.0001**

NonLocal	**1.4142**	**0.2794**	**5.062**	**<0.0001**
NoPurchase	0.3434	0.4683	0.733	0.4634

*Text in bold indicates the coefficient is significant at the 0.05 level.

7.2 Predicted Probabilities

As previously mentioned, it can be difficult to comprehend all of the relationships between the choices from the coefficients alone. By computing and graphing the predicted probabilities, these relationships become more evident. The formula for the predicted probability is more complex for the mixed logit model than for the CLM or Nested Logit model. Predicted unconditional probabilities are given by the multiple integral:

$$P(j\,|\,*) = \int_{V_q} P(j\,|\,*, v_q) g(v_q) dv_q$$

(20)

where the probability for the circumstances (* meaning the other covariates in the model) given that v_q occurs is:

$$P(j\,|\,*) = \frac{\exp(\beta_q' x_{jq})}{\sum_{m=1}^{J} \exp(\beta_j' x_{mq})}$$

(21)

(Because of the integral the IIA property does not hold for the mixed logit model.)

Just as the integrals involved in the model may be estimated by simulation, it is also possible to estimate the predicted probabilities by simulation. The fundamental result is that under certain conditions (Train, 2009) it is known that:

$$\text{plim}\frac{1}{R}\sum_{r=1}^{R} f(v_{qr}) = E[f(v_q)]$$

(22)

where $r = 1,\ldots, R$ indicates the R random simulations draws performed. Thus the unconditional probability above may be estimated using simulation. For more information concerning the simulation process see Caflisch (1998). Predicted probabilities were estimated for each of the choices. The probability of each choice was graphed against price for each state and each of four combinations of grocery store versus farmers' market and conventional versus organic. These twenty graphs can be viewed by state in Figures 7.1a-e.-7.4a-e.

Figures 7.1a-7.1e Probability of Choice by Price for Tomatoes; Conventional and Farmers' Market Attributes

Figure 7.1a. Delaware

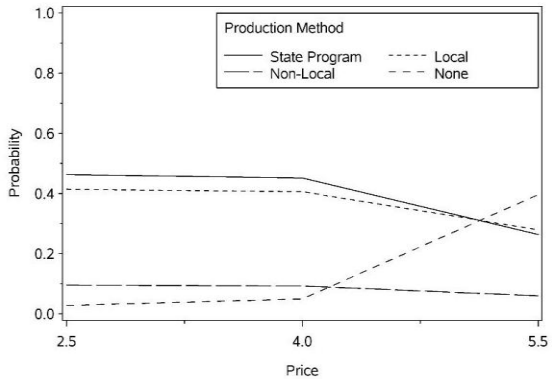


Figure 7.1b. Maryland

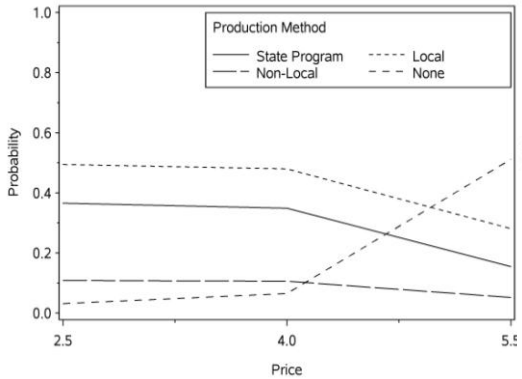


Figure 7.1c. New Jersey

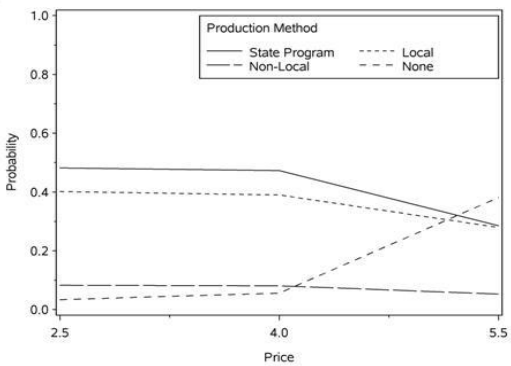


Figure 7.1d. Pennsylvania

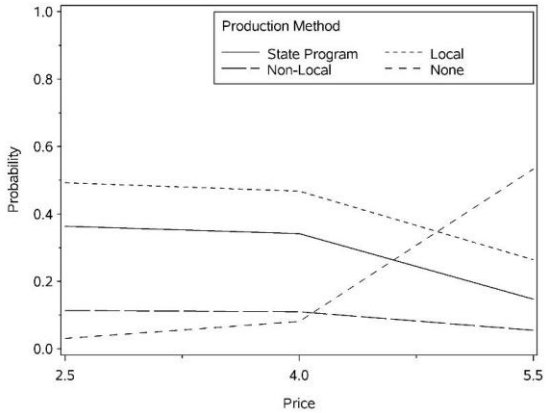
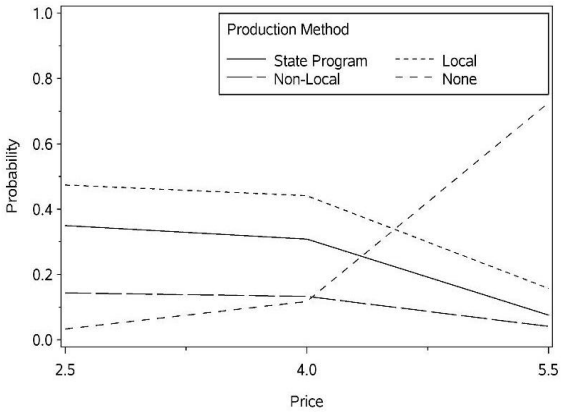


Figure 7.1e. Virginia



Figures 7.2a-7.2e Probability of Choice by Price for Tomatoes; Conventional and Grocery Store Attributes

Figure7.2a. Delaware

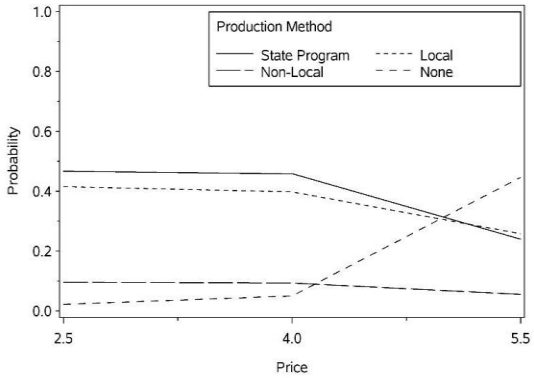


Figure 7.2b Maryland

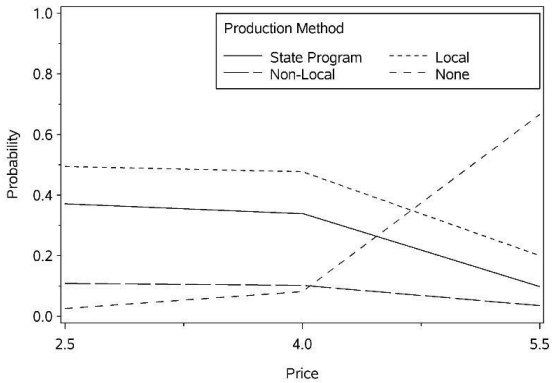


Figure 7.2c New Jersey

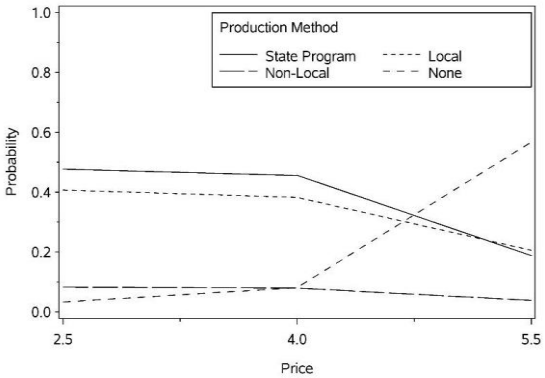


Figure 7.2d Pennsylvania

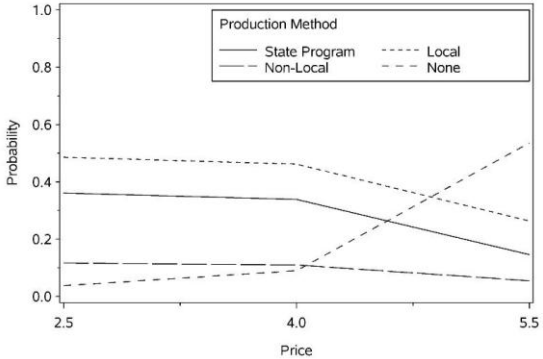
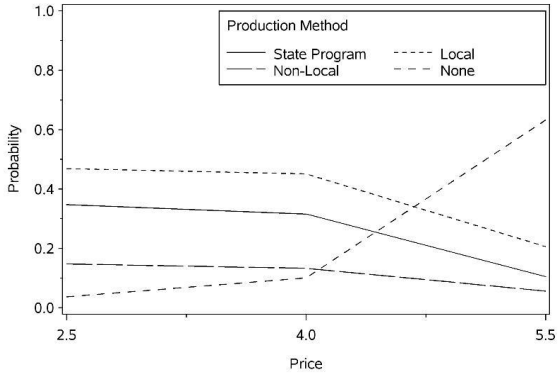


Figure 7.2e. Virginia



Figures 7.3a-7.3e Probability of Choice by Price for Tomatoes; Organic and Farmers' Market Attributes

Figure 7.3a. Delaware

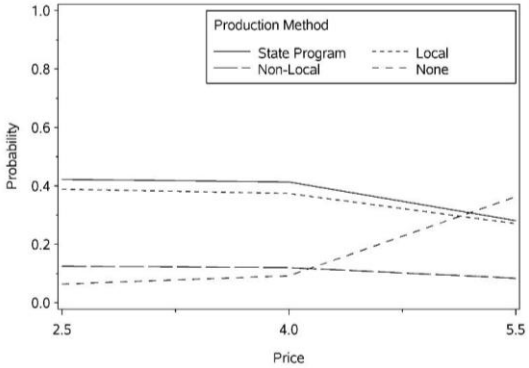


Figure 7.3b. Maryland

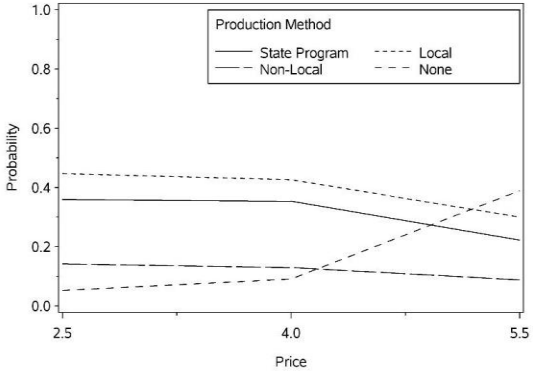


Figure 7.3c. New Jersey

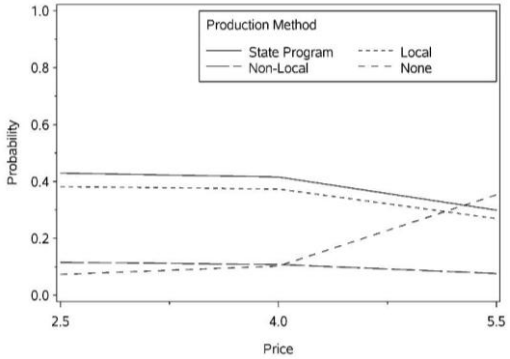


Figure 7.3d. Pennsylvania

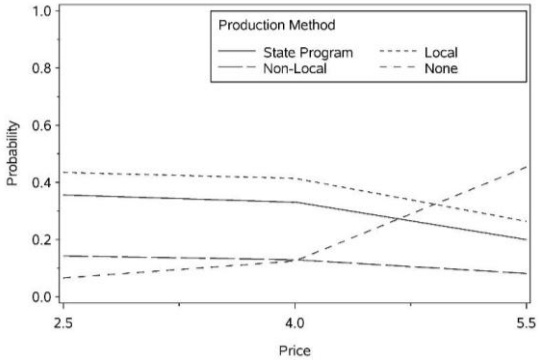
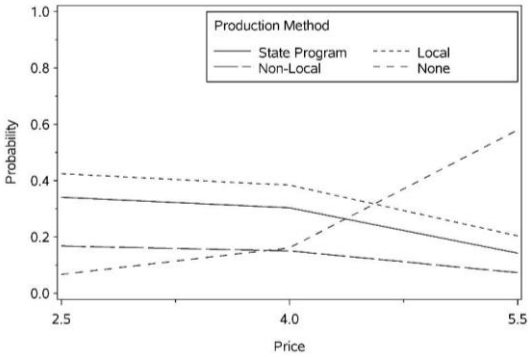


Figure 7.3e. Virginia



Figures 7.4a-7.4e Probability of Choice by Price for Tomatoes; Organic and Grocery Store Attributes

Figure 7.4a. Delaware

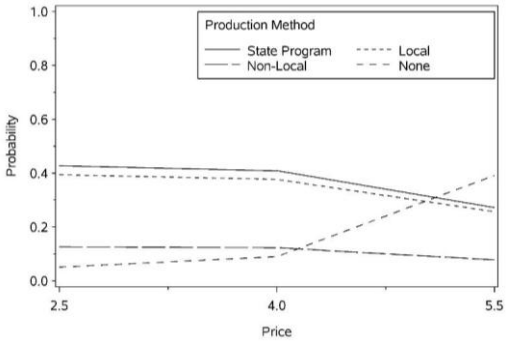


Figure 7.4b. Maryland

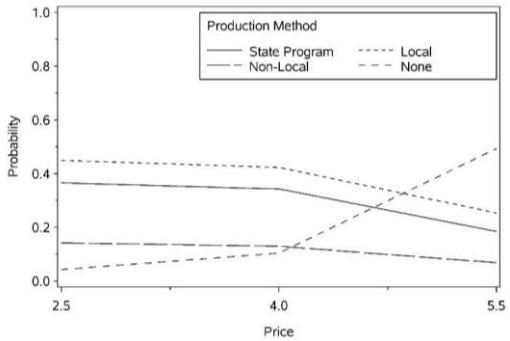


Figure 7.4c. New Jersey

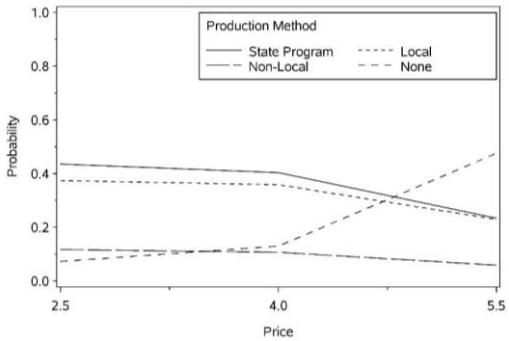


Figure 7.4d. Pennsylvania

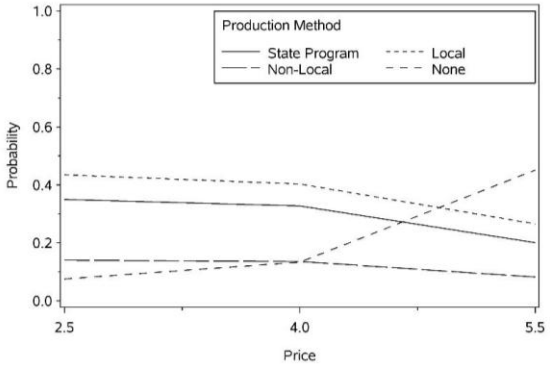
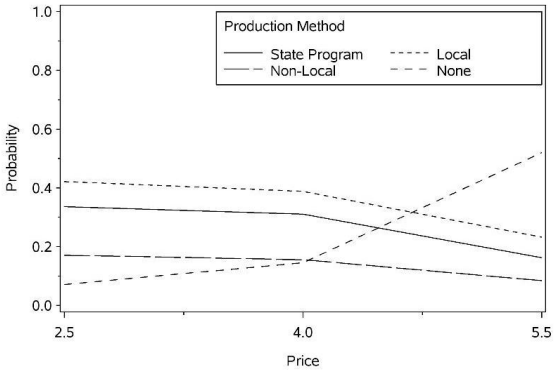


Figure 7.4e. Virginia



7.3 mWTP Estimates, Tomatoes

As earlier noted, it is necessary to integrate over the random terms to get a predicted probability for a choice under given circumstances. This is also appropriate in getting a willingness to pay (WTP) value for a population. However, since the functional form for price is quadratic, this means that there is a either minimum value or a maximum value to the utility and it may not be possible to equalize utilities as needed in finding WTP. This is not necessarily a problem with the model. In general it is required that utility decrease as price increases. However, this is required only over the price range (here $2.50 to $5.50) that the choice experiment measures. A quadratic functional form will always have a part that increases with price but any predictions made are extrapolations beyond the range of the data. Extrapolations should always be made carefully and especially with polynomial regression (Cohen et al., 2003).

For this study it seems to be the case that the utility for this tomato product falls off slowly from $2.50 to $4.00 and then more rapidly as the price increases to $5.50. The result is that for a number of circumstances the WTP does not exist. This makes it impossible to carry out the integration over the random effects. Accordingly it was decided to present the WTP values for the mean values of the distributions. The computations for WTP are described below.

As previously mentioned, if the effect for which willingness to pay is desired has a linear functional form and price also has the same form, then the marginal willingness to pay is $-\beta_{\text{effect}} / \beta_{\text{price}}$. This is the price change needed to keep the utility the same for a unit increase in the effect. It does not depend on the current level of the effect nor does it depend on the current price. If price has a quadratic functional form, then matters are more complex. Here there are two cases to consider. The first case is when we consider a change in choices such as from non-local to local or from conventional to organic. In the expression for utility, let β_{price} and β_{price^2} be the coefficients for price and price2 respectively (these will be different for each state). Let C be the current price, and let Δu be the change in utility made by the change in the effect.

The marginal willingness to pay is the price change needed to equalize the utilities. In particular it is a solution to the equation:

$$(\beta_{\text{price}}(C+\text{WTP})+\beta_{\text{price}^2}(C+\text{WTP})^2)-(\beta_{\text{price}}C+\beta_{\text{price}^2}C^2)=-\Delta u$$

(21)

This can be rewritten as the quadratic equation where $a=\beta_{\text{price}^2}$, $b=\beta_{\text{price}}+2C\beta_{\text{price}^2}$, and $c=\Delta u$. As previously mentioned, the quadratic formula gives:

$$\text{WTP}=\frac{-b\pm\sqrt{b^2-4ac}}{2a}.$$

(22)

In the model β_{price^2} is always negative. This implies that the desired solution is the one with the minus sign.

The second case is computing willing to pay when going from grocery store to farmers' market. Since there is a venue by price interaction, it is necessary to treat this somewhat differently. Let β_{price^2} be the coefficient for price^2. Let β_{price} be the coefficient for price for grocery store and let $\beta_{\text{price*venue}}$ be the interaction term for price by venue (grocery story is the reference level). Again let C be the current price and let Δu be the change in utility when going from grocery store to farmers' market. The marginal WTP then is a solution to the equation:

$$((\beta_{\text{price}}+\beta_{\text{price*venue}})(C+WTP)+\beta_{\text{price}^2}(C+WTP)^2)-(\beta_{\text{price}}C+\beta_{\text{price}^2}C^2)=-\Delta u$$

(23)

This can be rewritten as a quadratic equation where $a = \beta_{\text{price}^2}$, $b = \beta_{\text{price}} + \beta_{\text{price*venue}} + 2C\beta_{\text{price}^2}$ and $c = \Delta u + 2C\beta_{\text{price*venue}}$. As previously discussed above, the solution is given by the quadratic formula with the negative sign.

Marginal willingness to pay estimates for tomatoes by purchasing venue and state can be viewed in Table 7.2. For Delaware, New Jersey and Maryland, higher mWTP estimates were exhibited for tomatoes from a farmers' market venue compared to a grocery store venue, although the difference in the estimates are modest. This partially supports the earlier hypothesis that higher estimates would be exhibited overall for the farmers' market venue. This increased price premium however was not exhibited by consumers in Pennsylvania and Virginia.

Table 7.2 Marginal WTP by State and Price Level, Tomatoes[1]

	Delaware			New Jersey			Maryland			Pennsylvania			Virginia		
	$2.50	**$4.00**	**$5.50**	**$2.50**	**$4.00**	**$5.50**	**$2.50**	**$4.00**	**$5.50**	**$2.50**	**$4.00**	**$5.50**	**$2.50**	**$4.00**	**$5.50**
Farmers' Market Purchasing Venue:															
Non-Local to State Program	2.55	1.34	0.80	2.76	1.50	0.92	2.20	1.07	0.63	2.00	1.05	0.66	1.50	0.76	0.47
Non-Local to Local	2.44	1.23	0.73	2.61	1.37	0.82	2.35	1.20	0.72	1.83	0.92	0.56	1.68	0.89	0.56
Local to State Program	1.07	0.19	0.09	1.26	0.27	0.13	***	-0.28	-0.12	0.71	0.20	0.11	***	-0.20	-0.11
Conventional to Organic	***	-0.24	-0.10	***	-0.30	-0.12	0.79	0.11	0.05	***	-0.24	-0.12	***	-0.17	-0.09
Grocery Store Purchasing Venue:															
Non-Local to State Program	2.36	1.25	0.77	2.41	1.33	0.84	1.86	0.93	0.57	2.08	1.09	0.67	1.71	0.83	0.50
Non-Local to Local	2.24	1.15	0.70	2.25	1.20	0.75	2.01	1.06	0.66	1.91	0.95	0.58	1.89	0.97	0.60
Local to State Program	0.84	0.17	0.09	0.85	0.22	0.12	***	-0.21	-0.10	0.78	0.21	0.11	***	-0.23	-0.11
Conventional to Organic	***	-0.21	-0.09	***	-0.22	-0.10	0.43	0.09	0.05	***	-0.26	-0.12	***	-0.20	-0.10
Grocery Store to Farmers' Market:	***	-0.00	0.09	***	0.32	0.32	***	0.17	0.25	0.47	0.08	0.01	0.20	-0.11	-0.16

[1]Missing values indicated with asterisks were unable to be estimated due to extrapolation

For a few of the mWTP estimates at the $2.50 price level, the estimates were greater than $2.50, which is a problem of extrapolation. A brief discussion of the extrapolation issue was previously mentioned in the methods section above.

For all five states, a higher mWTP was exhibited for tomatoes identified as either state program or local, compared to non-local tomatoes, for both purchasing venues. In Delaware and New Jersey, consumers were willing to pay more than double for state program tomatoes priced at $2.50 from a farmers' market, compared non local tomatoes from the same purchasing venue. This supports the earlier hypothesis that local and state program tomatoes would be preferred over non-local, and provides continued support of the increased consumer interest in local food products within this region.

For consumers in Maryland and Virginia, the local attribute is preferred over each states' promotional marketing program, although higher estimates were exhibited in Maryland. Maryland consumers were willing to pay almost double for local tomatoes from a farmers' market priced at $2.50, compared to non local tomatoes. In Virginia however, consumers were willing to pay a premium of $1.68 for local farmers' market tomatoes priced at $2.50, compared to a non local version.

New Jersey, Delaware and Pennsylvania consumers exhibited an increased mWTP for tomatoes with their individual state marketing program slogan. mWTP estimates for strawberry preserves found that New Jersey was the only state where the state promotional program was preferred over the generic concept of local. This lends support to the idea that perhaps at this time, state promotional programs in some areas are associated by consumers with fresh produce items within the state. Additional marketing and effort is likely needed for these same promotional programs to be successful at increasing consumer WTP for value-added food products within their respective states. Lastly, Maryland was the only state that exhibited an increased mWTP for organic tomatoes compared to conventional tomatoes. For Organic tomatoes, Maryland consumers were willing to pay a premium of $0.79 for farmers' market

tomatoes priced at $2.50, and $0.43 for organic tomatoes from a grocery store. This result is likely contributed to the possible lack of understand among consumers as to the meaning behind the term organic.

Section 8
OTHER SURVEY QUESTION RESULTS

8.1. Purchasing Frequency of Food Products

The percentage of survey respondents who identified themselves as the primary purchaser of food products for their household can be viewed below in Table 8.1. Overall, about 78% of survey respondents were primary purchasers, with Delaware having the highest percentage of primary purchaser respondents averaging around 81%, and New Jersey the lowest at around 76%.

Table 8.1. Primary Purchaser of Food Products, by State

	Yes		No	
State	**Number**	**%**	**Number**	**%**
Delaware	325	80.85	77	19.15
Maryland	259	77.08	77	22.92
New Jersey	242	75.63	78	24.37
Pennsylvania	283	78.18	79	21.82
Virginia	241	76.02	76	23.98
Overall	1350	77.72	387	22.28

Respondents from each state additionally were asked how often in an average month they purchased food products from the following locations: grocery store and farmers' market, on a scale from 1 to 5 with 1 meaning never and 5 meaning very often. Across all five states, respondents on average purchased from a grocery store location 'often' or 'very often' and from a farmers' market location 'seldom' or 'occasionally', the results of which can be viewed in Table 8.2.

Table 8.2. Purchasing Frequency of Food Products by Venue[1]

	Grocery Store			Farmers' Market		
State	**Mean**	**Standard Deviation**	**Number**	**Mean**	**Standard Deviation**	**Number**
Delaware	4.45	0.77	405	2.53	1.13	383
Maryland	4.56	0.73	337	2.23	1.01	323
New Jersey	4.43	0.86	321	2.57	1.10	300
Pennsylvania	4.47	0.82	365	2.41	1.01	337
Virginia	4.52	0.75	320	2.21	0.97	284
Overall	4.49	0.79	1748	2.40	1.06	1627

[1]1 meaning never and 5 meaning very often

Expanding upon the purchasing frequency by venue question, respondents were next asked how often in an average month they purchased food products labeled or advertised as locally grown, organic, natural, and under each of the five states' promotional program slogan. Results from this question, by state and overall, can be viewed in Table 8.3. Respondents were asked again to respond on a scale from 1 to 5, with 1 meaning never and 5 meaning very often. Purchasing frequency of food products labeled or advertised as locally grown, organic, and natural were very similar across all five states. For locally grown and natural food products, respondents from all five states indicated in an average month that they purchased these products 'occasionally'. Organic food products were purchased slightly less frequent, with respondents from all five states indicating they purchased organic food products 'seldom' or 'occasionally' in an average month.

While the purchasing frequency of locally grown, organic and natural food products were consistent across all five states, this was not the case for food products identified under each state's promotional program slogan. Not surprisingly, purchasing frequency was highest for program promoted foods in the program's home state. *Jersey Fresh* food products had the highest purchasing frequency across all five states, with respondents indicating that products were purchased 'seldom'. New Jersey respondents though indicated purchasing *Jersey Fresh*

food products ‘occasionally’. It is important to note that this was also the highest purchasing frequency indicated for promotional program foods within a program’s home state. Delaware respondents indicated purchasing *Jersey Fresh* ‘seldom’, with Pennsylvania respondents indicating ‘never’ or ‘seldom’, and Maryland and Virginia respondents indicating a purchasing frequency of ‘never’. Considering that Maryland and Virginia are the two states that do not border New Jersey, this could help explain the above mentioned results.

Virginia’s Finest was the promotional program with the next highest overall purchasing frequency indicated at ‘seldom’ or ‘occasionally’. Perhaps since programs in both New Jersey and Virginia were established back in the 1980’s, they are more familiar and better known across this five state area. Virginia respondents indicated a purchasing frequency of ‘seldom’ or ‘occasionally’, with Delaware and Maryland respondents indicating ‘never’ or ‘seldom’, and New Jersey and Pennsylvania respondents indicating ‘never’.

For Delaware, Maryland, and Pennsylvania promotional programs, within each program’s home state, respondents on average purchased these food products ‘seldom’. For *Grown Fresh with Care in Delaware*, respondents that were not from Delaware on average indicated a purchasing frequency of ‘never’. Similarly for *PA Preferred*, respondents not from Pennsylvania also indicated a ‘never’ purchasing frequency. Lastly for *Maryland’s Best* food products, respondents from New Jersey, Pennsylvania, and Virginia indicated a purchasing frequency of ‘never’, with respondents from Delaware indicating ‘never’ or ‘seldom’. Additional results not mentioned here can be viewed in Table 8.3.

Table 8.3. Purchasing Frequency of Food Products in an Average Month[1]

Labeled or Advertised as….	Delaware			Maryland			New Jersey			Pennsylvania			Virginia			Overall		
	Mean	Standard Deviation	Number	Mean	Standard Deviation	Number	Mean	Standard Deviation	Number	Mean	Standard Deviation	Number	Mean	Standard Deviation	Number	Mean	Standard Deviation	Number
Locally Grown	3.24	0.98	373	3.13	1.03	327	3.08	1.03	304	3.19	0.95	340	2.96	1.04	285	3.13	1.01	1629
Organic	2.47	1.13	365	2.56	1.17	326	2.57	1.24	300	2.39	1.11	339	2.53	1.17	284	2.50	1.16	1614
Natural	2.98	1.09	365	2.89	1.16	322	3.00	1.13	297	2.86	1.09	334	2.92	1.07	282	2.93	1.11	1600
Grown Fresh with Care in Delaware	2.16	1.24	349	1.21	0.64	305	1.21	0.59	288	1.23	0.64	325	1.16	0.54	272	1.42	0.89	1539
Maryland's Best	1.54	0.91	350	2.10	1.25	320	1.18	0.51	290	1.29	0.68	328	1.34	0.76	274	1.50	0.93	1562
Jersey Fresh	2.04	1.14	353	1.29	0.75	306	3.16	1.09	302	1.65	1.04	329	1.17	0.50	271	1.88	1.18	1561
PA Preferred	1.39	0.77	348	1.21	0.62	303	1.20	0.53	290	2.08	1.26	327	1.23	0.61	275	1.44	0.88	1543
Virginia's Finest	1.42	0.80	348	1.39	0.83	305	1.18	0.51	290	1.25	0.63	328	2.56	1.20	283	1.54	0.96	1554

[1]1 meaning never and 5 meaning very often

8.2. State Marketing Program Awareness and Opinion Rating

In order to determine consumer awareness of each promotional program, respondents were asked first if they were aware of each program, and if they were their opinion of that promotional program. The percentage of respondents not aware of each program, by state and overall can be viewed in Table 8.4. Overall, the percentage of respondents not aware of the *Grown Fresh with Care in Delaware* program was greatest averaging 77%. *Jersey Fresh* was the program with the highest overall consumer awareness, with respondents not aware averaging 58%.

Interestingly Delaware was the only state surveyed where respondents from that state were more aware of another program, *Jersey Fresh*, than their own state's program. This could be because the *Grown Fresh with Care in Delaware* program was the youngest program out of the five. In Maryland, New Jersey, Pennsylvania, and Virginia, each state's home program had the most consumer awareness, across all five programs.

Respondents who had awareness of a state program were asked to rate their opinion of that program on a scale from 1 to 5, with 1 meaning 'very poor' and 5 meaning 'excellent'. The results of this question, by state and overall, can be viewed in Table 8.5. Excluding Virginia, in each state consumers indicated their opinion rating was highest for the *Jersey Fresh* program, with a rating of 'fair' or 'good'. In Virginia, the program with the highest opinion rating was their own *Virginia's Finest*, also with a rating of 'fair' or 'good'. Overall respondents had the highest opinion of the *Jersey Fresh* program, with the *Virginia's Finest* program receiving the second highest overall opinion rating, both with a rating of 'fair' or 'good'.

Delaware respondents indicated an opinion rating of their own state's program of 'fair' or 'good'. They also indicated an average opinion rating of 'fair' for Maryland, Pennsylvania, and Virginia's promotional programs. Maryland respondents indicated on average an opinion rating of 'fair' for all five programs. New Jersey respondents on average rated their

opinion of *Jersey Fresh* to be ‘fair’ or ‘good’, with an opinion rating on average of ‘fair’ for the remaining four programs. Pennsylvania respondents had an average opinion of ‘fair’ for every program but *Jersey Fresh*, which as previous mentioned received a rating of ‘fair’ or ‘good’. Lastly, Virginia respondents similarly rated every program excluding Virginia’s Finest as ‘fair’, and rated their own *Virginia’s Finest* as ‘fair’ or ‘good’.

Table 8.4. Percentage Not Aware of State Marketing Programs, by State

State Marketing Program	Delaware		Maryland		New Jersey		Pennsylvania		Virginia		Overall	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Grown Fresh with Care in Delaware	196	49.62	271	86.86	246	82.55	289	85.25	263	89.15	1265	77.18
Maryland's Best	263	67.78	162	49.09	245	82.21	273	80.77	216	73.47	1159	70.33
Jersey Fresh	180	45.92	255	81.73	51	15.94	231	66.96	254	85.52	971	58.28
PA Preferred	285	73.64	271	87.42	245	82.49	183	51.40	257	86.24	1241	75.30
Virginia's Finest	285	73.64	234	75.24	247	83.16	279	82.54	97	31.60	1142	69.63

Table 8.5. Opinion Rating of State Marketing Programs[1]

State Marketing Program	Delaware			Maryland			New Jersey		
	Mean	Standard Deviation	Number	Mean	Standard Deviation	Number	Mean	Standard Deviation	Number
Grown Fresh with Care in Delaware	3.43	1.10	199	3.19	1.05	41	2.75	1.17	52
Maryland's Best	3.15	1.02	125	3.27	1.10	168	2.89	1.09	53
Jersey Fresh	3.59	0.96	212	3.33	1.08	57	3.83	0.91	269
PA Preferred	2.84	1.07	102	2.90	1.05	39	2.73	1.12	52
Virginia's Finest	3.09	1.05	102	3.26	1.01	77	2.78	1.09	50

Pennsylvania			Virginia			Overall		
Mean	Standard Deviation	Number	Mean	Standard Deviation	Number	Mean	Standard Deviation	Number
3.18	1.02	50	3.16	0.85	32	3.25	1.10	374
3.15	1.00	65	3.22	0.98	78	3.17	1.05	489
3.57	0.98	114	3.09	1.13	43	3.63	0.98	695
3.33	1.11	173	3.02	0.65	41	3.06	1.08	407
2.86	0.96	59	3.77	0.95	210	3.35	1.07	498

[1]1 meaning very poor and 5 meaning excellent

8.3 Comparing State Program, Organic, and Local Foods

Respondents were asked on a scale from 1 to 5, with 1 meaning strongly disagree and 5 meaning strongly agree, to rate their agreement with several statements comparing organic foods with state program foods using their state's program slogan. Results from this question can be viewed in Table 8.6. These statements included more nutritious, safer to consume, better tasting, of higher quality, and more environmentally friendly. Using these same statements, respondents were also asked to similarly compare local foods with organic foods, the results of which can be viewed in Table 8.7.

When asked to compare organic foods with their state's promotional program foods, respondents in all five states agreed most with the statement that organic foods are more environmentally friendly than state program foods, with an average rating between 'neutral' and 'agree'. After more environmentally friendly, respondents from each state next agreed strongest with the statement that organic foods are safer to consume than state program foods, again with an average rating between 'neutral' and 'agree'. For the remaining statements, respondents from each state averaged a rating slightly above 'neutral', suggesting that across this five state region, consumers compare organic with state program foods in a similar manner. Perhaps perceived safety and environmental friendliness are two additional attributes needing to be explored further when attempting to target this Mid-Atlantic region.

Comparing local foods with organic foods, using the same set of statements mentioned above, respondents from each state agreed strongest with the statement that local foods are better tasting than organic foods with a rating between 'neutral' to 'agree'. Respondents from each state next agreed strongest with the statements that local foods were of higher quality, and more environmentally friendly than organic foods, with ties for these two statements in the case of two states. Similar to the results from comparing organic foods to state program foods, respondents across all states averaged a rating of 'neutral' for the remaining

statements. Overall, the two statements that received the highest agreement when comparing local foods to organic were better tasting and of higher quality. Stakeholders marketing and promoting local food products within this region no doubt could use these two characteristics to their advantage when targeting the local foods consumer.

Table 8.6. Compared with State Program Foods[1], Organic Foods[2] are…..

	Delaware			Maryland			New Jersey			Pennsylvania			Virginia			Overall		
	Mean	**Standard Deviation**	**Number**	**Mean**	**Standard Deviation**	**Number**	**Mean**	**Standard Deviation**	**Number**	**Mean**	**Standard Deviation**	**Number**	**Mean**	**Standard Deviation**	**Number**	**Mean**	**Standard Deviation**	**Number**
More nutritious	3.10	0.94	349	3.18	0.83	301	3.10	0.95	301	3.16	0.93	318	3.03	0.88	279	3.11	0.91	1548
Safer to consume	3.36	0.95	349	3.32	0.86	302	3.33	1.01	302	3.28	0.93	317	3.26	0.90	279	3.31	0.93	1549
Better tasting	3.10	0.93	348	3.11	0.82	303	3.01	0.94	300	3.10	0.92	318	3.07	0.88	280	3.08	0.91	1549
Of higher quality	3.18	0.93	349	3.24	0.82	303	3.20	0.97	300	3.25	0.93	317	3.13	0.86	280	3.20	0.91	1549
More environmentally friendly	3.50	0.95	349	3.49	0.88	302	3.58	1.00	298	3.53	0.98	317	3.47	0.91	278	3.51	0.94	1544

[1]State program foods referring to each state's individual state marketing program
[2]1 meaning strongly disagree and 5 meaning strongly agree

Table 8.7. Compared with Organic Foods, Local Foods are[1]….

	Delaware			Maryland			New Jersey		
	Mean	**Standard Deviation**	**Number**	**Mean**	**Standard Deviation**	**Number**	**Mean**	**Standard Deviation**	**Number**
More nutritious	3.02	0.86	364	3.05	0.85	313	2.96	0.83	301
Safer to consume	3.00	0.86	364	3.03	0.88	315	2.91	0.86	299
Better tasting	3.28	0.87	361	3.35	0.86	312	3.18	0.92	301
Of higher quality	3.12	0.82	362	3.17	0.85	310	3.08	0.91	301
More environmentally friendly	3.15	0.93	360	3.17	0.96	310	3.04	0.91	300

Pennsylvania			Virginia			Overall		
Mean	**Standard Deviation**	**Number**	**Mean**	**Standard Deviation**	**Number**	**Mean**	**Standard Deviation**	**Number**
3.14	0.90	336	2.94	0.86	286	3.03	0.86	1600
3.14	0.91	338	2.98	0.91	283	3.01	0.89	1599
3.41	0.87	337	3.21	0.92	286	3.29	0.89	1597
3.24	0.90	337	3.11	0.93	280	3.15	0.88	1590
3.24	0.94	334	3.03	0.90	281	3.13	0.93	1585

[1]1 meaning strongly disagree and 5 meaning strongly agree

8.4 Defining Local

Another area of considerable interest was how Mid-Atlantic consumers defined local, in terms of distance and geographical location, as well as what percentage of product ingredients need to be local for the product itself to be consider local. Respondents were asked to identify the percentage that a product needs to be produced and/or grown locally for them to consider it to be a local food product, the results of which can be viewed in Table 8.8.

Across all five states, the majority of consumers identified that 81-100% of a product must be locally produced and/or grown for it to be local. An average of 77% of Delaware respondents identified the 81-100% percentage for local, making up the largest percentage of respondents across states within this category. Pennsylvania respondents made up the smallest percentage of respondents within this 81-100% local percentage averaging 67%. Overall an average of 72% of respondents identified the 81-100% category for a product to be considered local, with 15% of respondents identifying the 61-80% category for local ingredients.

Also of interest was determining from how many miles away a food product could originate from for it still to be considered local. Results from this question can be viewed in Table 8.9. Maryland and Virginia respondents provided the largest mileage distance averaging 84 miles, with Delaware respondents having the next largest mileage distance averaging 78 miles. As Pennsylvania respondents reported a mileage averaging 75 miles, it is difficult to make a generalization between mileage and state size from these results. New Jersey respondents reported the smallest mileage distance averaging 68 miles. Overall, across all five states the average mileage distance reported was around 78 miles.

Table 8.8. "For you to consider a food product to be "local", what percentage of that product needs to be produced and/or grown locally?"

	0-20%		21-40%		41-60%		61-80%		81-100%	
State	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Delaware	6	1.49	12	2.99	20	4.99	55	13.72	308	76.81
Maryland	0	0.00	8	2.42	25	7.58	47	14.24	250	75.76
New Jersey	3	0.96	11	3.53	23	7.37	53	16.99	222	71.15
Pennsylvania	6	1.68	10	2.8	40	11.2	61	17.09	240	67.23
Virginia	7	2.27	8	2.6	36	11.69	48	15.58	209	67.86
Overall	22	1.29	49	2.87	144	8.43	264	15.45	1229	71.96

Table 8.9. "I consider a food product to be local if it is ____ miles away."

Respondents	**Mean**	**Standard Deviation**	**Number**
Delaware[1]	78.10	74.45	376
Maryland	83.83	57.35	308
New Jersey	67.71	50.08	285
Pennsylvania	75.10	78.38	344
Virginia	83.72	66.34	301
Overall[1]	77.76	67.27	1614

[1] 1Outlier with a value of 3,000 removed

In addition to defining what is local from a mileage standpoint, it was of importance to determine whether other geographical boundaries such as state, county and nearby states could be used to help define local. Respondents were asked to rate their agreement with a series of statements on a scale from 1 to 5, with 1 meaning strongly agree and 5 meaning strongly disagree, for the question "I consider a food product produced and/or grown within this area to be 'local'". These statements, as well as results by state and overall, can be found in Table 8.10.

For each state, respondents exhibited the strongest agreement for a food product from 'in my county' as being local with an average response of 'agree'. For every state but Delaware, respondents next agreed strongest with the statement 'up to 100 miles away in my state' for a food product to be considered local, again with an average rating of 'agree'. Delaware respondents, however, agreed the next strongest with the statement 'anywhere in my state regardless of distance' with a rating of 'agree'. As Delaware is the smallest state out of the five surveyed, it makes sense that respondents from this state might consider a food product from anywhere in the state as local. For every state but Pennsylvania, respondents gave the statements 'in my county', 'up to 100 miles away in my state', and 'anywhere in my state regardless of distance' an average rating between 'neutral' and 'agree'.

For the statement 'up to 100 miles away in a surrounding state', respondents across all five states on average were neutral as to whether food products from this geographical location were local. Respondents from each state additionally gave a rating of 'disagree' to 'neutral' for the statement 'anywhere in a surrounding state regardless of distance'.

An additional component to this question was whether or not respondents considered a food product to be local if it came from any of the other four individual states included. Delaware respondents gave the highest agreement rating for 'in Maryland' with an average agreement of 'neutral' for food products from in Maryland. As Maryland is the state which primarily borders the largest geographical area of Delaware, this result is not surprising. Delaware respondents also gave an average rating of 'neutral' to food products being considered

local from New Jersey and Pennsylvania, which are Delaware's other two neighboring states, and an average rating of 'disagree' for food products from Virginia being local.

Respondents from the four remaining states exhibited a slightly lower agreement for each state than was seen in Delaware. Maryland, New Jersey, and Pennsylvania respondents on average rated their agreement with food products being local from each of the listed states between 'disagree' to 'neutral'. Virginia respondents exhibited some of the lowest agreement ratings for each state, averaging around 'disagree' when asked to consider whether food products from within these states were local.

Table 8.10. "I consider a food product produced and/or grown within this area to be 'local'…."[1]

	Delaware			Maryland			New Jersey		
	Mean	Standard Deviation	Number	Mean	Standard Deviation	Number	Mean	Standard Deviation	Number
In my county	3.85	1.32	368	3.90	1.41	322	3.75	1.38	299
Up to 100 miles away, in my state	3.62	1.08	361	3.63	1.20	318	3.65	1.09	298
Anywhere in my state, regardless of distance	3.75	1.06	370	3.26	1.24	324	3.46	1.16	299
Up to 100 miles away, in a surrounding state	3.13	1.19	363	3.12	1.28	322	2.91	1.13	295
Anywhere in a surrounding state, regardless of distance	2.50	1.02	365	2.50	1.14	319	2.44	1.00	295
In Delaware	……	…….	……	2.47	1.24	319	2.20	1.02	294
In Maryland	2.90	1.11	365	……	……	……	2.00	0.89	293
In New Jersey	2.83	1.16	364	2.13	1.06	318	……	……	……
In Pennsylvania	2.79	1.12	365	2.40	1.18	319	2.34	1.02	293
In Virginia	2.40	1.03	365	2.60	1.24	319	1.99	0.89	293

Pennsylvania			Virginia			Overall		
Mean	**Standard Deviation**	**Number**	**Mean**	**Standard Deviation**	**Number**	**Mean**	**Standard Deviation**	**Number**
3.83	1.33	341	3.95	1.33	287	3.85	1.35	1617
3.63	1.07	338	3.75	1.10	286	3.65	1.11	1601
2.83	1.09	339	3.06	1.12	290	3.28	1.18	1622
2.99	1.18	337	2.85	1.22	284	3.01	1.21	1601
2.36	1.05	335	2.27	1.00	289	2.42	1.05	1603
2.28	1.11	334	1.85	0.95	282	2.21	1.11	1229
2.22	1.06	336	2.21	1.14	285	2.36	1.11	1279
2.38	1.16	337	1.80	0.93	283	2.32	1.15	1302
……	……	……	1.88	0.98	283	2.38	1.13	1260
2.10	1.01	336	……	……	……	2.28	1.08	1313

[1]1 meaning strongly disagree and 5 meaning strongly agree

8.5 Health and Diet

Lastly, it was of interest to determine how healthy consumers in this region considered their diet. The results of this question can be viewed in Table 8.11, as well as broken down by percentages in Table 8.12. Respondents were asked to rate how healthy they considered their diet on a scale from 1 to 4, with 1 meaning poor and 4 meaning excellent. Respondents from each state were very similar in that on average they rated their diet as being 'good'. While the majority of respondents from each state rated their diet within the 'good' category, the next largest percentage of respondents for each state rated their diets to be within the 'poor' category.

Looking at individual differences between states, Virginia was the state with the highest percentage of respondents within the 'poor' category, as well as the largest percentage within the 'excellent' category. It appears Virginia consumers display the widest variation when it comes to the health of their diet. Additionally, New Jersey respondents had the highest percentage of ratings within the 'good' category.

Table 8.11. "How healthy do you consider your diet?"[1]

Respondents	Mean	Standard Deviation	Number
Delaware	2.88	0.63	381
Maryland	2.90	0.68	334
New Jersey	2.88	0.61	305
Pennsylvania	2.88	0.63	348
Virginia	2.88	0.70	304
Overall	2.88	0.65	672

[1]1 meaning poor and 4 meaning excellent

Table 8.12. "How healthy do you consider your diet?" (Breakdown of responses)

	Poor		Fair		Good		Excellent	
State	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Delaware	4	1.05	88	23.10	239	62.73	50	13.12
Maryland	6	1.80	78	23.35	193	57.78	57	17.07
New Jersey	6	1.97	59	19.34	205	67.21	35	11.48
Pennsylvania	2	0.58	85	24.42	213	61.21	48	13.79
Virginia	8	2.63	73	24.01	171	56.25	52	17.10
Overall	26	1.56	383	22.91	1021	61.06	242	14.47

Section 9
DISCUSSION AND CONCLUSIONS

9.1 Conclusions and Implications

Undoubtedly consumer preference for local exists in the Mid-Atlantic region. The results from this study suggest that consumer preference for state marketing program promoted food products and purchasing venue may vary within the same region, depending on whether a fresh or value added product is investigated. The CE results of this study indicate that for value added products, more generalized buy local promotions would be more effective than state specific promotions, and could be targeted by county and/or state region. The results also suggest that for fresh produce, state marketing programs may be more successful than their value added counterparts at increasing consumer WTP for produce from within their state. For these same promotional programs to attract increased premiums for value added food products, additional marketing and promotion, and attention to increasing consumer awareness will be needed.

While an increased mWTP for value added products was exhibited overall for the farmers' market venue, this same premium for produce items was only present in three of the five states examined. While it appears that an increased premium can be obtained for value added products at a farmers' market venue, the same cannot be concluded for produce items in the Mid-Atlantic region. Consumers in this region then may feel that local or state program produce purchased from either venue is comparable. However, the novelty of a value-added food product at the farmers' market location may help explain this result. As many grocery stores continue to feature and promote locally grown produce at their locations, consumers may instead be visiting farmers' market locations in search of local products not found at area grocery stores. This may also be an indication that local farmers' within this region have been successful at promoting their produces at both purchasing venues. Farmers' markets may have to continue

to search for new and interesting ways to attract consumers to their location, such as providing unique programs or opportunities for learning that their grocery store counterparts do not.

Other survey question results suggest that the Mid-Atlantic consumer considers an area in their county, as well as up to 100 miles away in their state, to be local. This supports earlier findings by Hu et al. (2010) who found consumers considered local to be an area less than 100 miles, as well as previous work by Brown (2003) who also uncovered that consumers consider an area smaller than the borders of their state to be local.

This study suggests that especially for larger states, consumers' definition of what they consider to be local is likely a region smaller than just the borders of their state. Delaware, the smallest state surveyed (and second smallest in the country) had a higher agreement rating with anything in their state being local, regardless of distance. This suggests that for many larger states, state promotional promotions may not be effectively capturing the local foods consumer. It would be more beneficial for these state marketing agencies then to focus on local promotions on a county and regional level rather than just statewide. Perhaps in the future more county promotional programs will be seen than statewide promotional programs.

Additional findings from this study suggest programs in Delaware, Maryland, and Pennsylvania would need to focus on consumer awareness if their programs were to succeed. There is an additional opportunity for state promotional programs in all five states to improve Mid-Atlantic consumers' opinion of them. Delaware's state marketing agency is likely headed in the right direction by choosing to discontinue their program, as the results of this study would have supported their earlier decision. State marketing agencies in these three states then may decide their programs are not worth continuing, as was the case in Delaware.

The results of this study also suggest an additional challenge for programs in Maryland, Pennsylvania, and Virginia. With respondents from these states exhibiting a smaller preference difference between state program and non-local than was seen in the other two states,

it will be difficult for these programs to succeed. As consumer interest in local continues, it will be interesting to follow whether these state marketing programs do as well.

As New Jersey's program *Jersey Fresh* is well established and more heavily promoted than programs in other states, New Jersey will likely continue building off of their program's current success. The results of this study suggest New Jersey is presently the only Mid-Atlantic state with a marketing program that is successfully capturing the local foods consumer. Producers and marketers eligible to use the *Jersey Fresh* slogan on their food products would be wise to do so when targeting the New Jersey consumer. Whether or not consumers in other Mid-Atlantic states would be willing to pay a price premium for *Jersey Fresh* products would be useful information for producers and marketers both.

Only one state in this study, Maryland, exhibited a higher consumer preference for organic over natural or conventional, indicating consumers in the Mid-Atlantic region likely lack a full understanding as to the meaning behind these terms. Consumer preference for organic over natural or conventional could be seen in the future as interest in organic continues to grow, however, consumers would first need to be better educated as to the definitions of these terms. In this study, consumers did agree the most with organic foods being more environmentally friendly and safer to consume than state program foods. These two product attributes could be important when marketing organic products to the Mid-Atlantic consumer. Producers and marketers looking to gain a price premium for their organic products would need to incorporate some type of educational component into their promotional activities.

Additionally, this study suggests that there is an opportunity for farmers' markets to capture more shoppers than they are presently. The results of this survey indicate that consumers across all five states consider their diet to be of 'good' health. Therefore, the Mid-Atlantic consumer might be particularly drawn to the types of fresh, unprocessed products that farmers' market venues typically purvey. Similarly, the findings here indicate higher price premiums for products identified as local at farmers' market venues, compared to grocery store venues.

Producers and marketers then should be actively targeting farmers' market venues in the Mid-Atlantic region. State marketing agencies likewise should also be promoting local products at these venues, as well as actively encouraging the establishment of such farmers' markets within their state borders. It would also be wise for state marketing agencies to focus on the promotion and consumer awareness of farmers' markets within their state.

If the intangible benefits consumers associate with the farmers' market venue can be uncovered, perhaps grocery stores could better appeal to these same consumers. For example, if consumers are attracted to farmers' markets because of the opportunity to meet area farmers, grocery stores in this same area could similarly host local producers whose products they carry in-store. Farmers' markets in many areas of the country are often seasonal venues with limited hours and/or days of operation. It would be helpful information then for grocery store venues, which are open to consumers year round and with more extended hours, to be able to take advance of this increased price premium. It is also quite possible that consumers in this region associate an aspect of health with products from a farmers' market venue.

The results of this study indicate a price premium is present for value-added products purchased at a farmers' market venue, and that a similar premium may be exhibited for produce items at a farmers' market within certain states.

9.2 Limitations

Although a definition for the term 'state marketing program' was included on the information sheet accompanying the survey, it could have been more helpful for respondents if the logo for each state program had been included as well. Unfortunately, approval from each state agency for including such logos was not able to be obtained. In addition, in attempting to define locally grown, a more detailed study focusing on just this might yield additional results.

9.3 Suggestions for Future Research

Whether or not state marketing programs in larger states, such as Maryland, Pennsylvania, and Virginia should be continued is a topic open for debate. Certainly *Jersey Fresh* has been the most successful Mid-Atlantic program in terms of both consumer awareness and preference. However, they seem to be the exception rather than the norm. It would be wise for states to explore whether their own promotional program should be continued, or if a county and/or regionally specific local program would be more effective. In addition, whether or not consumers in other Mid-Atlantic states are willing to pay a price premium for *Jersey Fresh* products is an area in need of current exploration.

The results of this study indicate that a majority of consumers consider a product to be local if it is between 81-100% locally grown and/or processed. Whether or not consumers are more stringent or lenient with this percentage, based on whether the product in question is fresh or value-added, is an area requiring further research.

Investigating whether consumers are more interested in locally grown, as opposed to organic and/or natural could also be a natural extension of this study and potentially useful contribution. In the future, as consumers become more educated as to the meaning behind organic, a price premium for a product both local and organic could be seen. If such a finding was evident in the future, it would be of importance to a variety of stakeholders in the Mid-Atlantic region.

While previous research has been conducted on the advantages of farmers' markets (Zepeda and Leviten-Reed, 2004), uncovering exactly what benefits consumers are responding to would be an area in need of further investigation. Once uncovered, the door opens for a multitude of research opportunities, one of which is whether these same benefits can be captured in a grocery store setting.

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Publications and Presentations Generated (as of August 2011)

Publications and Working Papers

1. Onken, Kathryn A. and John C. Bernard. (2010). "Catching the "Local" Bug: A Look at State Agricultural Marketing Programs." *Choices* 25(1): 1-7.

2. Onken, Kathryn A., John C. Bernard, and John D. Pesek, Jr. (2011). "Comparing Willingness to Pay for Organic, Natural, Locally Grown and State Marketing Program Promoted Foods in the Mid-Atlantic Region." *Agricultural and Resource Economics Review* 40(1): 33-47.

3. Onken, Kathryn A., John C. Bernard, and John D. Pesek, Jr. "The Influence of Locally Grown and Purchasing Venue on Mid-Atlantic Consumers' Preference for Fresh Produce." *Working Paper.*

Presentations

1. Onken, Kathryn A., John C. Bernard, and John D. Pesek. "Preferences for Local, Organic, and State Marketing Program Promoted Foods: A Choice Experiment of Mid-Atlantic Consumers." *Northeastern Agricultural and Resource Economics Association, Workshop on the Economics of Local Food Markets*, Atlantic City, New Jersey, June 2010. (poster presentation)

2. Onken, Kathryn A., John C. Bernard, and John D. Pesek. "Comparing Preferences for Local and State Marketing Promoted Foods by Venue and State: A Choice Experiment of Mid-Atlantic Consumers." *Food Distribution Research Society*, Sandestin, Florida, October 2010. (selected paper presentation)

Appendix I
SURVEY COVER LETTER

November 2, 2009

Dear [redacted]

I am writing to ask for your assistance in a study I am conducting with my graduate student, Kathryn Onken, as part of a United State Department of Agriculture (USDA) grant. The purpose of this study is to determine consumer willingness to pay for locally grown, organic and natural foods, as well as gather other useful information for both producers and state-sponsored agricultural marketing programs. The data collected from this study will be used by Kathryn for her thesis. Enclosed with this letter you will find a survey being sent to consumers in five states in the Mid-Atlantic region. Your name was one of these 5,000 randomly selected residents from the following five states: Delaware, New Jersey, Pennsylvania, Virginia and Maryland.

As a consumer, you are constantly faced with willingness-to-pay decisions every time you purchase food from your local grocery store or farmers market. We are interested in whether your decision to purchase food products is affected by it being labeled as local, organic or natural, or whether the price of the product affects your decision, or if you are affected by a combination of both.

Your responses to this survey are voluntary and completely confidential. The number appearing on the return envelope is only for the purpose of allowing us to check you off our mailing list as a respondent, and in no way will it be used to personally identify you. Once you return your completed survey, your name will be deleted from our mailing list and never connected to your answers in any way. If we do not receive a response from you, we will be sending out another copy of the survey. A reminder postcard will also be sent to this same address.

In addition to the survey, we have enclosed a small token of our appreciation for your help in our study. Also enclosed you will find an informational sheet with definitions for several types of foods. Please read this sheet before completing the survey. After completing the survey, please fold and return it in the postage-paid envelope provided. If you prefer not to complete the survey for any reason, please indicate this on the survey, and return it in the enclosed postage-paid envelope.

We would be happy to answer any questions or concerns you may have about this study. We can be reached by email at jbernard@udel.edu or by phone at (302) 831-1380. You can also write us at the address indicated on the letterhead.

Thank you in advance for your assistance in this important study.

Sincerely,

John Bernard

John C. Bernard
Associate Professor

Appendix II
SURVEY QUESTIONS AND INFORMATION SHEET

Please read this sheet before completing our survey.
It will help you better understand the
questions being asked and save you time!

Below you will find explanations for some labels and wording that will appear throughout the survey:

IMPORTANT TERMS:

"Organic" - contains no synthetic pesticides, hormones or antibiotics, no irradiation, no genetically modified (GM) ingredients, and no petroleum or sewage sludge fertilizers. Organic also means access to pasture (ex: cows) or the outdoors (ex: chicken). Products are inspected and certified by the USDA, and must be at least 95% organic.

"Natural" - contains no artificial ingredients or coloring, and has been minimally processed (the raw product has not been fundamentally altered during processing). The label must explain the use of the term natural (ie. no added colorings or artificial ingredients; minimally processed).

"Conventional" -most food fits into this category, which means it is not certified organic, is not irradiated, and many contain GM ingredients. It may also have been produced using antibiotics, pesticides, hormones and chemical fertilizers within government standards and limits.

"Local" - the definition of local is flexible and has different meaning for each person. Whether or not someone views a food as "local" is often determined by distance traveled from where it was grown, produced or processed. Some interpret local to mean a very small area (such as a city and its surroundings) while others interpret it to mean the borders of their state and/or region.

"State Marketing Programs"- these agricultural marketing programs are designed to help identify state-specific products, as well as increase consumer demand for them. While program components vary by state, each currently has at least one state-specific logo in place as a way to gain recognition for their state's products.

SURVEY BLOCK 1

What Are YOUR Preferences For Local, Organic and Natural Foods?

Please complete the following survey, answering as many questions as possible. Your answers will remain anonymous.

1) On a scale from 1 to 5, how often in an average month do you purchase food products from the following locations? (Circle one each):

Never	Seldom	Occasionally	Often	Very Often
1	2	3	4	5

a) Grocery Store	1	2	3	4	5
b) Farmers' Market	1	2	3	4	5

2) On a scale from 0 to 5, please rate your opinion of the following state marketing programs. (Circle one each):

Not Aware of Program	Very Poor	Poor	Fair	Good	Excellent
0	1	2	3	4	5

a) "Jersey Fresh"	0	1	2	3	4	5
b) "Grown Fresh with Care in Delaware"	0	1	2	3	4	5
c) "PA Preferred"	0	1	2	3	4	5
d) "Virginia's Finest"	0	1	2	3	4	5
e) "Maryland's Best"	0	1	2	3	4	5

3) On a scale from 1 to 5, how often in an average month do you purchase food products labeled or advertised as…….

Never	Seldom	Occasionally	Often	Very Often
1	2	3	4	5

a) Locally Grown?	1	2	3	4	5
b) Organic?	1	2	3	4	5
c) Natural?	1	2	3	4	5
d) "Jersey Fresh" ?	1	2	3	4	5
e) "Grown Fresh with Care in Delaware" ?	1	2	3	4	5
f) "PA Preferred"?	1	2	3	4	5
g) "Virginia's Finest"?	1	2	3	4	5
h) "Maryland's Best"?	1	2	3	4	5

4) On a scale from 1 to 5, please rate your agreement with the following statement, for each statement listed below:

"Compared with GROWN FRESH WITH CARE IN DELAWARE foods, ORGANIC foods are……"

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

a) More nutritious	1	2	3	4	5
b) Safer to consume	1	2	3	4	5
c) Better tasting	1	2	3	4	5
d) Of higher quality	1	2	3	4	5
e) More environmentally friendly	1	2	3	4	5

5) On a scale from 1 to 5, please rate your agreement with the following statement, for each statement listed below:

"Compared with ORGANIC foods, LOCAL foods are....."

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

a) More nutritious	1	2	3	4	5
b) Safer to consume	1	2	3	4	5
c) Better tasting	1	2	3	4	5
d) Of higher quality	1	2	3	4	5
e) More environmentally friendly	1	2	3	4	5

6) On a scale from 1 to 5, please rate your agreement with the following statement, for each area listed below: *"I consider a food product produced and/or grown within this area to be "local""*

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

a) In my county	1	2	3	4	5
b) Up to 100 miles away, in Delaware	1	2	3	4	5
c) Anywhere in Delaware, regardless of distance	1	2	3	4	5
d) Up to 100 miles away, in a surrounding state	1	2	3	4	5
e) Anywhere in a surrounding state, regardless of distance	1	2	3	4	5
f) In New Jersey	1	2	3	4	5
g) In Maryland	1	2	3	4	5
h) In Pennsylvania	1	2	3	4	5
i) In Virginia	1	2	3	4	5

7) Please complete the statement below:

I consider a food product to be "local" if it is ***within*** _____ ***miles*** away.

8) For you to consider a food product to be "local", what *percentage* of that product needs to be produced and/or grown locally?

☐ 0-20% ☐ 41-60% ☐ 81-100%
☐ 21-40% ☐ 61-80%

9) Which choice would you purchase for each food product?
(Please note prices and attributes vary.)

SAMPLE:

SET #5

	"Grown Fresh with Care in Delaware" Conventional Grocery Store $5.49	Local Conventional Farmers Market $3.99	Non-Local Organic Grocery Store $2.49	None
CHECK ONE	☐	☒	☐	☐

9a) FOOD PRODUCT #1: One quart (about 5) of medium-sized **Red Tomatoes**. For **EACH** of the 6 choice sets below, please check one box per set :

SET #1

	"Grown Fresh with Care in Delaware" Conventional Grocery Store $5.49	Local Conventional Farmers Market $3.99	Non-Local Organic Grocery Store $2.49	None
CHECK ONE	☐	☐	☐	☐

SET #2

"Grown Fresh with Care in Delaware" Conventional Grocery Store $2.49	Local Organic Farmers Market $2.49	Non-Local Organic Grocery Store $5.49	None
CHECK ONE ☐	☐	☐	☐

SET #3

"Grown Fresh with Care in Delaware" Conventional Farmers Market $2.49	Local Conventional Grocery Store $5.49	Non-Local Organic Farmers Market $5.49	None
CHECK ONE ☐	☐	☐	☐

SET #4

"Grown Fresh with Care in Delaware" Conventional Farmers Market $5.49	Local Conventional Grocery Store $2.49	Non-Local Organic Farmers Market $2.49	None
CHECK ONE ☐	☐	☐	☐

SET #5

"Grown Fresh with Care in Delaware" Organic Farmers Market $2.49	Local Organic Grocery Store $5.49	Non-Local Conventional Farmers Market $3.99	None
CHECK ONE ☐	☐	☐	☐

SET #6

"Grown Fresh with Care in Delaware" Organic Grocery Store $3.99	Local Conventional Farmers Market $5.49	Non-Local Conventional Grocery Store $2.49	None
CHECK ONE ☐	☐	☐	☐

9b) FOOD PRODUCT #2: One 18 oz. jar of **Strawberry Preserves.**

For **EACH** of the 6 choice sets below, please check one box per set :

SET #1

"Grown Fresh with Care in Delaware" Natural Grocery Store $4.99	Local Natural Farmers Market $3.99	Non-Local Organic Grocery Store $2.99	None
CHECK ONE ☐	☐	☐	☐

SET #2

"Grown Fresh with Care in Delaware" Natural Grocery Store $2.99	Local Organic Farmers Market $2.99	Non-Local Organic Grocery Store $4.99	None
CHECK ONE ☐	☐	☐	☐

SET #3

"Grown Fresh with Care in Delaware" Natural Farmers Market $2.99	Local Natural Grocery Store $4.99	Non-Local Organic Farmers Market $4.99	None
CHECK ONE ☐	☐	☐	☐

SET #4

"Grown Fresh with Care in Delaware" Natural Farmers Market $4.99	Local Natural Grocery Store $2.99	Non-Local Organic Farmers Market $2.99	None
CHECK ONE ☐	☐	☐	☐

SET #5

"Grown Fresh with Care in Delaware" Organic Farmers Market $2.99	Local Organic Grocery Store $4.99	Non-Local Natural Farmers Market $3.99	None
CHECK ONE ☐	☐	☐	☐

SET #6

"Grown Fresh with Care in Delaware" Organic Grocery Store $3.99	Local Natural Farmers Market $4.99	Non-Local Natural Grocery Store $2.99	None
CHECK ONE ☐	☐	☐	☐

10) What is your gender?

☐ Male ☐ Female

11) What is your current age?

☐ Under 25 ☐ 45-54 ☐ 65-69 ☐ 80 or above
☐ 25-34 ☐ 55-59 ☐ 70-74
☐ 35-44 ☐ 60-64 ☐ 75-79

12) How healthy do you consider your diet?

☐ Poor ☐ Fair ☐ Good ☐ Excellent

13) What is the highest level of education you have completed?

☐ Less than high school graduate ☐ Associate degree
☐ High school graduate ☐ Bachelor degree
☐ Some college, no degree ☐ Graduate or professional degree

14) Are there any children under the age of 18 living in your household?

☐ Yes ☐ No

15) What is your race or nationality? (Check one or more)

- ☐ White
- ☐ Black, African American
- ☐ Hispanic or Latino
- ☐ American Indian or Alaskan
- ☐ Asian
- ☐ Native Hawaiian/Other Pacific Islander
- ☐ Other

16) Are you the primary purchaser of food products in your household?

☐ Yes ☐ No

17) Which of the following categories best describes your total household income annually? (Check one)

- ☐ Less than $10,000
- ☐ $10,000 to $14,999
- ☐ $15,000 to $24,999
- ☐ $25,000 to $34,999
- ☐ $35,000 to $49,999
- ☐ $50,000 to $74,999
- ☐ $75,000 to $99,999
- ☐ $100,000 to $124,999
- ☐ $125,000 to $149,999
- ☐ $150,000 to $199,999
- ☐ $200,000 to $249,999
- ☐ $250,000 or more

Thank you for your participation!

If you have any comments, please write them in the space below:

Please return your completed survey in the enclosed envelope to:

Dr. John C. Bernard
Department of Food and Resource Economics
University of Delaware
229 Townsend Hall
Newark, DE 19716

Additional questions about this survey may be directed to Kathryn Onken at konken@udel.edu

SURVEY BLOCK 2

7) Please complete the statement below:

I consider a food product to be "local" if it is *within* _____*miles* away.

8) For you to consider a food product to be "local", what *percentage* of that product needs to be produced and/or grown locally?

☐ 0-20% ☐ 41-60% ☐ 81-100%
☐ 21-40% ☐ 61-80%

9) Which choice would you purchase for each food product?
(Please note prices and attributes vary.)

SAMPLE:

SET #5

	"Grown Fresh with Care in Delaware" Conventional Grocery Store $5.49	Local Conventional Farmers Market $3.99	Non-Local Organic Grocery Store $2.49	None
CHECK ONE	☐	☒	☐	☐

9a) FOOD PRODUCT #1: One quart (about 5) of medium-sized Red Tomatoes. For EACH of the 6 choice sets below, please check one box per set :

SET #1

	"Grown Fresh with Care in Delaware" Conventional Farmers Market $2.49	Local Conventional Grocery Store $5.49	Non-Local Organic Grocery Store $2.49	None
CHECK ONE	☐	☐	☐	☐

SET #2

"Grown Fresh with Care in Delaware" Organic Grocery Store $5.49	Local Conventional Grocery Store $2.49	Non-Local Organic Farmers Market $3.99	None
CHECK ONE ☐	☐	☐	☐

SET #3

"Grown Fresh with Care in Delaware" Organic Farmers Market $5.49	Local Organic Grocery Store $3.99	Non-Local Conventional Grocery Store $5.49	None
CHECK ONE ☐	☐	☐	☐

SET #4

"Grown Fresh with Care in Delaware" Conventional Grocery Store $3.99	Local Organic Farmers Market $2.49	Non-Local Conventional Farmers Market $5.49	None
CHECK ONE ☐	☐	☐	☐

SET #5

"Grown Fresh with Care in Delaware" Organic Grocery Store $2.49	Local Organic Farmers Market $5.49	Non-Local Conventional Farmers Market $2.49	None
CHECK ONE ☐	☐	☐	☐

SET #6

"Grown Fresh with Care in Delaware" Organic Farmers Market $5.49	Local Conventional Farmers Market $2.49	Non-Local Conventional Grocery Store $3.99	None
CHECK ONE ☐	☐	☐	☐

9b) FOOD PRODUCT #2: One 18 oz. jar of Strawberry Preserves.

For EACH of the 6 choice sets below, please check one box per set :

SET #1

"Grown Fresh with Care in Delaware" Natural Farmers Market $2.99	Local Natural Grocery Store $4.99	Non-Local Organic Grocery Store $2.99	None
CHECK ONE ☐	☐	☐	☐

SET #2

"Grown Fresh with Care in Delaware" Organic Grocery Store $4.99	Local Natural Grocery Store $2.99	Non-Local Organic Farmers Market $3.99	None
CHECK ONE ☐	☐	☐	☐

SET #3

"Grown Fresh with Care in Delaware" Organic Farmers Market $4.99	Local Organic Grocery Store $3.99	Non-Local Natural Grocery Store $4.99	None
CHECK ONE ☐	☐	☐	☐

SET #4

"Grown Fresh with Care in Delaware" Natural Grocery Store $3.99	Local Organic Farmers Market $2.99	Non-Local Natural Farmers Market $4.99	None
CHECK ONE ☐	☐	☐	☐

SET #5

"Grown Fresh with Care in Delaware" Organic Grocery Store $2.99	Local Organic Farmers Market $4.99	Non-Local Natural Farmers Market $2.99	None
CHECK ONE ☐	☐	☐	☐

SET #6

"Grown Fresh with Care in Delaware" Organic Farmers Market $4.99	Local Natural Farmers Market $2.99	Non-Local Natural Grocery Store $3.99	None
CHECK ONE ☐	☐	☐	☐

10) What is your gender?

☐ Male ☐ Female

11) What is your current age?

☐ Under 25 ☐ 45-54 ☐ 65-69 ☐ 80 or above
☐ 25-34 ☐ 55-59 ☐ 70-74
☐ 35-44 ☐ 60-64 ☐ 75-79

12) How healthy do you consider your diet?

☐ Poor ☐ Fair ☐ Good ☐ Excellent

13) What is the highest level of education you have completed?

☐ Less than high school graduate ☐ Associate degree
☐ High school graduate ☐ Bachelor degree
☐ Some college, no degree ☐ Graduate or professional degree

14) Are there any children under the age of 18 living in your household?

☐ Yes ☐ No