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Comparing Willingness to Pay for Organic, Natural, Locally Grown, and State Marketing Program Promoted Foods in the Mid-Atlantic Region

Kathryn A. Onken, John C. Bernard, and John D. Pesek, Jr.

A choice experiment of Mid-Atlantic consumers was conducted to determine marginal willingness to pay for the attributes organic, natural, locally grown, and state marketing program promoted for strawberry preserves. The influence of purchasing venue on willingness to pay was also examined. Results indicated a price premium when purchased at a farmers market across all five states and versions. Organic was preferred to natural in only one state. Preference ordering between local and state program promoted varied. Consumers in Maryland and Pennsylvania clearly preferred local, while those in New Jersey seemed most likely to prefer the state program version.

Key Words: organic, natural, locally grown, state marketing program, choice experiment

Increases in the total sales of organic and natural food products, 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. Of these, the organic food sector appears to be the fastest growing and most promoted. This has mostly occurred since the 2002 establishment of the USDA's National Organic Program (NOP). The NOP created a system for certifying organic products, providing labels and standardization (USDA 2010a). As evidence of growth in the sales of organic-labeled products, from 1990 to 2009, sales grew $23.8 billion, with sales up 5.1 percent in 2009 (Organic Trade Association 2010).

Unlike USDA-certified organic products, products designated as "natural" are not subject to an official 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 (USDA 2010b). According to research conducted by the Nielsen Company (2009), food products designated as "natural" experienced a 37 percent increase in sales from 2004 to 2008. It reported that 55,000 food products currently feature labeling identifying them as natural.

Local foods have also seen a dramatic increase in availability and demand. The increase can at least partly be seen in the increase in farmers markets, which heavily feature products that are locally grown and/or locally made. Such markets witnessed a 201 percent increase from 1994 to 2009 (USDA 2009). Increased demand has been evident in sales projected to reach $7 billion by 2011 (Packaged Facts 2007). Unlike products designated as "organic" or "natural," there is no USDA definition for "local." The term remains 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 a state, or a region encompassing several states.

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As interest in locally grown foods continues to rise, state-sponsored marketing campaigns have responded by increasing in number. Not surprisingly, many states have attempted to take advantage of this increased interest by marketing products from within their own borders. At some point, every state has had in place some type of marketing campaign, including logos, slogans, and a variety of promotional activities (Onken and Bernard 2010).

Understanding these growing trends and how they interact is an area in need of additional examination. Comprehending consumer attitudes towards and preferences between these four trends, as well as determining willingness to pay (WTP), would be of importance to producers, marketers, and state marketing agencies. For state marketing programs, evidence of effectiveness could be crucial for deciding if their programs are worth continuing. Marketers in the food industry could gain information that would help them better reach and promote to their targeted audience. Producers could use this information to help plan what areas of the food industry they need to be producing for, and whether or not the attributes of their products are meeting the needs of their consumers.

The primary goal of this research was thus to determine consumer preferences and WTP for the attributes organic, natural, locally grown, and promoted by a state marketing campaign. Along with this goal were two key objectives. First was to determine if these preferences and WTP varied across the Mid-Atlantic region, where state size and differences in state marketing programs may have an influence. The second key objective was to explore whether the results varied depending on whether products were purchased at a grocery store or at a farmers market. As organic and local products become more available in traditional grocery outlets, it becomes important to see if the premiums they can gain match those in farmers markets.

To accomplish these goals a large-scale mail survey was targeted to consumers from five states in the Mid-Atlantic region: Delaware, Maryland, Virginia, New Jersey, and Pennsylvania. Respondents were presented with explanations adapted from formal USDA definitions for the terms “organic” and “natural” in order to clarify the distinction between the two terms. The key part of this survey was a choice experiment (CE) for strawberry preserves. The details of the design will be discussed below. First, though, it is important to understand the various state marketing programs across the region.

Literature Review

State Programs

While organic and natural standards would be consistent across states, individual state programs may vary considerably [for more details, see Onken and Bernard (2010)]. The five state marketing programs in the Mid-Atlantic region examined here vary in terms of program length, level of establishment and promotion, and certification and percentage requirements. The region contains perhaps the best known program, New Jersey’s *Jersey Fresh* campaign, established in 1983. Seen as a benchmark, it prompted many other states to begin their own efforts. In order to use the logo, parties must register and pay a $30 fee. The program has a formal certification process and requires that 100 percent of a product’s ingredients come from within the state (State of New Jersey 2009). The next oldest program in the region is *Virginia’s Finest*, begun in 1989. Parties using the logo must be a Virginia agricultural producer, or food processor, with a product that meets the program’s quality standards. While there is no program fee, participants must meet their industry’s standards and receive certification. Processed food products must be approved by a special review committee. There is no set minimum percentage requirement of local content for a product to bear the program logo (Commonwealth of Virginia 2009).

The other programs are much newer. *PA Preferred*, Pennsylvania’s marketing logo, was established in 2004. Processed products must receive their final packaging and processing in the state, 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. Although there is a minimum percentage requirement, there is no formal certification process (Commonwealth of Pennsylvania 2009). Although discontinued in 2010, the *Grown Fresh with Care in Delaware* program was launched in 2007 and in operation at the time of this research. The logo was allowed on products with ingredients that originated from within Delaware, although an actual percentage of ingredients were not defined (State of Delaware 2009). The *Maryland's Best* program was created in 2002. Similar to Delaware's former program, there is no certification process, nor is there any minimum percentage requirement for products bearing the program's logo (State of Maryland 2009).

Consumer Preference and WTP

Previous research investigating consumer preference and WTP for natural food has not been especially prevalent, leaving room for contribution in the area of consumer preference for natural compared to organic. Gifford and Bernard (forthcoming) found that many consumers have little knowledge of what the term "natural" entails. Their study showed that, prior to information on the standards for "natural" and "organic," many consumers believed both had the same requirements.

In contrast, interest in organic foods has prompted numerous consumer studies. Yiridoe, Bonti-Ankomah, and Martin (2005) conducted a literature review of some and concluded that consumer WTP for organic products appears to decrease with premium level. Hughner et al. (2007) performed a similar review, and argued that consumer interest in organic products varied much, in part due to a lack of basic understanding of what "organic" means. More recently, Batte et al.'s (2007) study in Ohio found that consumers were willing to pay price premiums for organic products, while Bond, Thilmany, and Bond (2008) concluded that consumers place a value on organic production, and may view organic as being higher quality.

Several studies have been conducted concerning consumer preferences for organic and locally grown foods. In a small pilot study conducted in Georgia, organic products were found by Stegelin (2008) to make up a significant portion of local products purchased by consumers. Thilmany, Bond, and Bond (2008) concluded that consumers often placed a greater value on local production over organic production, using data from a national survey conducted in 2006. Hu, Woods, and Bastin (2009) investigated Kentucky consumers' WTP for processed blueberry products using a choice experiment and found consumer preference strongest for products identified as local as opposed to products identified as organic. Additionally, Loureiro and Hine (2002) surveyed Colorado consumers and concluded that they were willing to pay a higher premium for potatoes designated as *Colorado Grown* than for potatoes identified as organic or GMO-free.

Other studies have focused more on local foods alone. Darby et al. (2008) found that Ohio consumers preferred foods marketed as locally grown over those identified as grown in the United States. They suggested that for larger states, such as Ohio, state boundaries may serve as natural borders for consumers when it comes to defining "local." In an earlier study conducted in Arizona, Patterson et al. (1999) similarly concluded that consumers prefer to purchase local products, in particular those identified under the *Arizona Grown* logo, compared to products from other regions. Schneider and Francis (2005) determined that some Nebraska consumers were willing to pay at least a 10 percent price premium for products from within their county, suggesting a smaller scope for local. 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 specialty food products produced within their state.

According to Jekanowski, Williams, and Schiek (2000), perceived quality of a local product had the strongest impact on Indiana consumers' purchasing likelihood. Their results suggested a demand for local products that a well-planned state marketing program could capture. However, they emphasized that if a state program allowed its quality standards to fall below those of competing states, such a state would essentially be branding its products as lower quality. Thus, with studies showing consumer preference for local, the next question is whether states can capture this interest with state marketing programs.

Existing studies suggest that some state marketing programs have been successful at increasing consumer demand for and sales of state products. Carpio and Isengildina-Massa (2009) evaluated South Carolina's *SC Grown* program and found that consumer demand for South Carolina grown produce had risen 3.4 percent one year after the program's inception. The California Department of Agriculture and the Buy California Marketing Agreement found that sales of California agricultural products had increased 7.1 percent since the start of the *CA Grown* program in 2002, amounting to almost $900 million (State of California 2009). Govindasamy et al. (2004) estimated that for the year 2000, the *Jersey Fresh* program had increased sales of fresh produce by $36.6 million. Hanagriff, Lau, and Rogers (2009) conducted a study of the Texas wine industry, mainly supported under the *Go Texan* program. They found that in 2007, for each dollar spent on promoting Texas wine, sales increased by $2.16.

Survey and Choice Experiment Design

The key part of the survey for this study was a choice experiment designed to determine consumer preferences and WTP. Lusk and Hudson (2004) noted that choice experiments, which are prominently used in marketing research, are useful because they closely mimic actual consumer shopping behavior. However, there is the concern of potential hypothetical bias when using choice experiments. Lusk and Schroeder (2004) tested for hypothetical bias utilizing a CE featuring beef ribeye steaks. They concluded that while hypothetical choices overestimated total WTP, marginal WTP (mWTP) was not statistically different between hypothetical and non-hypothetical settings. Carlsson and Martinsson (2001) used a CE of donations for different types of environmental projects to examine hypothetical bias in mWTP estimates. They too failed to uncover a statistically significant difference between hypothetical and actual mWTP. Choice experiments therefore likely provide good estimates of real mWTP. The choice experiment was constructed as a D-optimal design using SAS software programs developed by Kuhfeld (2009). Strawberry preserves were chosen since they were a familiar product available locally in each state and under each state's promotional slogan.

The experimental design featured four product attributes, displayed in Table 1. They include purchasing venue, production method, price, and location. The attribute price had three levels determined using current market prices from a wide range of purchasing venues. Purchasing venue and production method both had two levels. For production method, "natural" was viewed as the appropriate base, as most non-organic strawberry preserves available on the market are identified as natural (e.g., Smuckers). Lastly, "location" had three levels, which included local, non-local, and the appropriate state slogan.

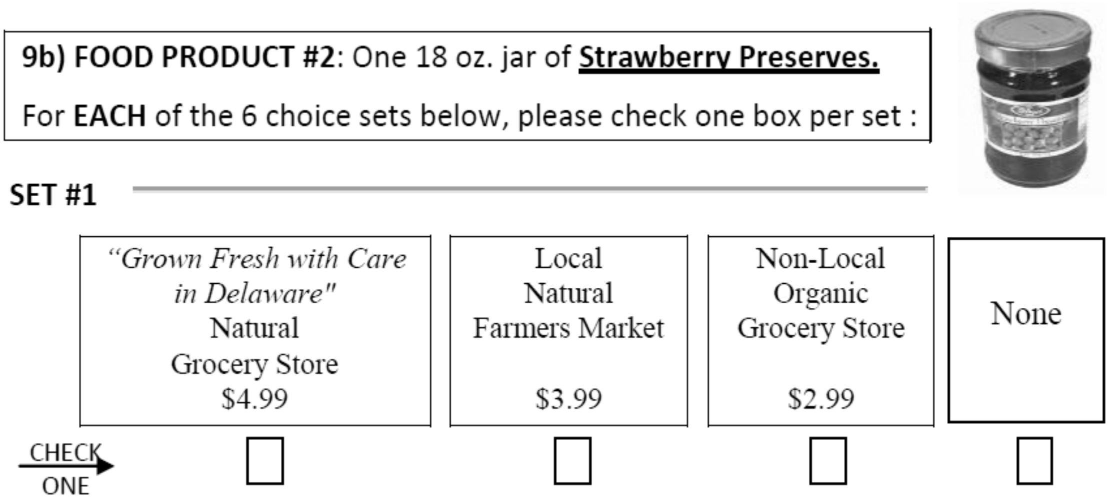
Table 1. Choice Experiment Attributes and Levels

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
Purchasing venue	grocery store, farmers market
Price	$2.99, $3.99, $4.99

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

In designing the experiment, two competing criteria had to be considered (Lusk and Norwood 2005). The first was to include all the terms in the model that might be important. The second was to restrict the number of choice sets to avoid respondent fatigue. It was decided to limit the choice sets for each respondent to six. The terms chosen for the model included a quadratic functional form for price, the effects of purchasing venue and production method, as well as the interactions price by purchasing venue, price by production method, and purchasing venue by production method. To do this, at least twelve choice sets are required. Therefore an additional block factor was added so that at random one-half of the respondents would receive six of the twelve choice sets and the rest of the respondents would receive the remaining half dozen. This was accomplished by mailing two versions of the survey for each state.

A sample choice set is given in Figure 1. Since there are three prices, two venues, and two production methods, there are $3 \times 2 \times 2 = 12$ possibilities for each of the choices of state program, local, and non-local, and, of course, just one no-purchase option. Thus there are $12^3 \times 1 = 1{,}728$ possible choice sets. A computer search algorithm was done using the D-optimality criterion for the conditional logit model (CLM) with the terms noted above to find the twelve choice sets used in the design out of the 1,728 mentioned above. This was done using SAS macros created by Kuhfeld



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 →

Figure 1. Sample Choice Set

(Kuhfeld 2009). Unlike least squares, the D-optimal design for a conditional logit model depends on the coefficients of the model. The design was optimized under the assumption that all coefficients were zero since there was no reason to assume any other values. The D-optimality criterion minimizes the generalized variance of the parameter estimates and is the most widely used design criterion since it has a number of attractive properties such as scale invariance (Atkinson and Donev 1992).

In addition to the choice experiment, the survey contained several other questions to gain a better understanding of consumer preferences. These included questions regarding consumers' 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. Lastly, the survey contained standard demographic questions to judge the sample. Accompanying the survey was an information sheet respondents were asked to read prior to completing the survey. This sheet contained definitions for the terms "organic" and "natural," and can be viewed in Table 2. Prior to mailing the survey, it was piloted in two undergraduate classes totaling 50 students. The feedback received mainly concerned the presentation of the choice experiment portion. Therefore the layout of this section was slightly altered, and each set numbered to make the section easier for respondents to navigate.

Table 2. Terms Included on Information Sheet Accompanying Survey

Term	Definition / Explanation
Organic[a]	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 (e.g., cows) or the outdoors (e.g., chicken). Products are inspected and certified by the USDA, and must be at least 95 percent organic.
Natural[b]	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" (i.e., no added colorings or artificial ingredients; minimally processed).

[a] Adapted from formal USDA definition (USDA 2010a).
[b] Adapted from formal USDA definition (USDA 2010b).

Mailing lists of 1,000 households from the five states—Delaware, Maryland, Virginia, New Jersey, and Pennsylvania—were purchased through USAData, for a total potential sample of 5,000 (4,661 after bad addresses were removed). Following the guidelines of Salant and Dillman (1994), a Tailored Design consisting of five separate contacts with respondents was used. An advance postcard announcing the survey was mailed the third week in October 2009. A first mailing of the survey was then sent the first of November. This included a cover letter explaining the survey, a survey and information sheet, a stamped return envelope, and a $1 token of appreciation. The information sheet contained definitions of terms in the study, with explanations for "organic" and "natural" from USDA sources and local and state marketing programs briefly covered. 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 response rate was 39.6 percent. Response rates by state were 45.5 percent for Delaware, 39.1 percent for Maryland, 36.7 percent for New Jersey, 40.5 percent for Pennsylvania, and 36.3 percent for Virginia. Demographics of the respondents were compared to the population of each state according to the 2000 Census. While the population of each state was fairly well represented by the survey, the sample did tend to display less racial diversity and slightly higher education and income levels. Such issues are typical with mail surveys and were not considered to be an issue.

Data Analysis

There are a number of possible methods to analyze data from choice experiments. The simplest approach is the conditional logit model (CLM). However, this model assumes the independence of irrelevant alternatives (IIA). Here, the no-purchase option is very different from the options where preserves are purchased, and it seems unlikely that IIA would hold. Instead, a two-level nested logit was chosen where state program, local, and non-local were in one nest, and no-purchase was in the other. This allowed choices within nests to be correlated and is a partial relaxation of the IIA assumption. These two nests, or branches, are identified as "Purchase" and "No Purchase." The terms "nest" and "branch" are used here interchangeably.[1]

According to Hensher and Greene (2002), care must be taken in normalizing a nested model. They present three possible normalizations called RU1, RU2, and RU3. RU1 normalizes the lowest-level parameters, referred to as "elemental alternatives," which in the model presented here are the four choices. RU2 normalizes the upper-level parameters, which here are the two branches Purchase and No Purchase. Lastly, the RU3 normalization is identical to RU2, but proposes a slight transformation on the parameters. Of these three, Hensher and Greene (2002) argue that RU2 is the best approach, especially when the nested logit has a degenerate branch (one in which there is only one choice) such as the No Purchase nest. Accordingly, a nested model with an RU2 normalization was fitted. As dictated by the design the original model included a quadratic functional form for price, the effects of purchasing venue, and production method, as well as interactions with price and purchasing venue and price and production method. There was also an interaction term for purchasing venue and production method. Then interactions of state with each of price, price squared, purchasing venue, and production method were included. A series of likelihood ratio tests showed that a number of these terms were not significant and 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 were not significant. The utilities for the final model are given by:

$$\begin{aligned} U(\text{State Program}) = \beta_{12}\,&\text{FarmMkt}_i \\ &+ \beta_{13}\,\text{Price}_i\,\text{FarmMkt}_i \\ &+ \beta_{14}\,\text{Price}_i + \beta_{15}\,\text{Price}_i^2 \\ &+ \beta_{16}\,\text{Organic}_i \\ &+ \beta_{17}\,\text{MD}_i\text{Organic}_i \\ &+ \beta_{18}\,\text{NJ}_i\text{Organic}_i \\ &+ \beta_{19}\,\text{PA}_i\text{Organic}_i \\ &+ \beta_{20}\,\text{VA}_i\text{Organic}_i, \end{aligned}$$

$$\begin{aligned} U(\text{Local}) = \beta_1\,&\text{Local}_i + \beta_2\,\text{MD}_i\text{Local}_i \\ &+ \beta_3\,\text{NJ}_i\text{Local}_i + \beta_4\,\text{PA}_i\text{Local}_i \\ &+ \beta_5\,\text{VA}_i\text{Local} + \beta_{12}\text{FarmMkt}_{ii} \\ &+ \beta_{13}\,\text{Price}_i\,\text{FarmMkt}_i + \beta_{14}\,\text{Price}_i \\ &+ \beta_{15}\,\text{Price}_i^2 + \beta_{16}\,\text{Organic}_i \\ &+ \beta_{17}\,\text{MD}_i\text{Organic}_i + \beta_{18}\,\text{NJ}_i\text{Organic}_i \\ &+ \beta_{19}\,\text{PA}_i\text{Organic}_i + \beta_{20}\,\text{VA}_i\text{Organic}_i, \end{aligned}$$

$$\begin{aligned} U(\text{Non}-\text{Local}) = \beta_6\,&\text{NonLocal}_i \\ &+ \beta_7\,\text{MD}_i\text{NonLocal}_i \end{aligned}$$

---

[1] Following Hensher and Greene (2002), the tree is assumed to branch downward, so the lowest levels are the individual choices.

$$
\begin{aligned}
&+ \beta_8 \,\mathrm{NJ}_i \mathrm{NonLocal}_i \\
&+ \beta_9 \,\mathrm{PA}_i \mathrm{NonLocal}_i \\
&+ \beta_{10} \,\mathrm{VA}_i \mathrm{NonLocal}_i \\
&+ \beta_{12} \mathrm{FarmMkt}_i \\
&+ \beta_{13} \,\mathrm{Price}_i \,\mathrm{FarmMkt}_i \\
&+ \beta_{14} \,\mathrm{Price}_i + \beta_{15} \,\mathrm{Price}_i^2 \\
&+ \beta_{16} \,\mathrm{Organic}_i \\
&+ \beta_{17} \,\mathrm{MD}_i \mathrm{Organic}_i \\
&+ \beta_{18} \,\mathrm{NJ}_i \mathrm{Organic}_i \\
&+ \beta_{19} \,\mathrm{PA}_i \mathrm{Organic}_i \\
&+ \beta_{20} \,\mathrm{VA}_i \mathrm{Organic}_i ,
\end{aligned}
$$

$$U(\text{No Purchase}) = \beta_{11} \mathrm{NoPurchase}_i ,$$

where the variables are defined in Table 3.

To give a complete model description, it is necessary to define how the probabilities of the choices are computed from the utilities. Let the choices State Program, Local, Non-Local, and No Purchase be represented by $k = 1, 2, 3$, and 4, respectively. According to Hensher and Greene (2002), these choices are called "elemental alternatives." The elemental alternatives level, or lowest level probabilities, are given by:

$$\mathrm{P}(k \mid i) = \frac{\exp\left(\mu(i) U(k)\right)}{\sum_1^{K_i} \exp\left(\mu(i) U(k)\right)} = \frac{\exp\left(\mu(i) U(k)\right)}{\exp(\mathrm{IV}(i))},$$

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

$$IV(i) = \ln\left(\sum_1^{K_i} \exp(\mu(i) U(k))\right)$$

is the inclusive value for branch i. The model consists of two branches, Purchase and No Purchase, represented by $i = 1, 2$, respectively. The branch-level, or upper-level, probabilities are given by:

$$p(i) = \frac{\exp(\mathrm{IV}(i) / \mu(i))}{\sum_1^2 \exp(\mathrm{IV}(i) / \mu(i))}.$$

The probabilities of choices $k = 1, 2, 3, 4$ are given by $\Pr(k) = \mathrm{P}(k \mid i) p(i)$. These predicted probabilities of the choices comprise the dependent variable in the nested logit model.

Computations were done using NLOGIT 3.0 (Greene 2003). In order to get convergence, price was scaled by dividing by 5 so that it varied between 0 and 1 like the dummy variables. In the results, table scaling was restored to the original.

Table 3. Description of Variables

Variable Name	Description
Local	1 if the respondent selected the local choice option[a]
NonLocal	1 if the respondent selected the non-local choice option[a]
NoPurchase	1 if the respondent selected the no purchase choice option[a]
FarmMkt	1 if the respondent chose the farmers market venue[a]
Price	Price for an 18-oz. jar of strawberry preserves
Organic	1 if the respondent chose the organic attribute[a]
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

[a] Dummy variable where value is zero otherwise.

Marginal Willingness to Pay

When price and the effect for which willingness to pay is desired both have linear functional forms, the marginal willingness to pay is $-\beta_{\text{effect}} / \beta_{\text{price}}$. This is the price increase needed to keep the utility of the good the same after a unit increase in effect. It depends on neither the current price nor the current level of effect. If price has a quadratic functional form, 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 marginal willingness to pay is the price change needed to equalize utilities. In particular it is a solution to the equation:

$$
\begin{aligned}
&[\beta_{\text{price}} (C + \mathrm{WTP}) + \beta_{\text{price}^2} (C + \mathrm{WTP})^2] \\
&- (\beta_{\text{price}} C + \beta_{\text{price}^2} C^2) = -\Delta u.
\end{aligned}
$$

This can be rewritten as the quadratic equation $a\text{WTP}^2 + b\text{WTP} + c = 0$, where $a = \beta_{\text{price}^2}$, $b = \beta_{\text{price}} + 2C\beta_{\text{price}^2}$, and $c = \Delta u$. The quadratic formula gives:

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

In the model both β_{price} and β_{price^2} are negative. This implies that the desired solution is the one with the minus sign. Quadratic functional forms and willingness to pay have been considered before (see Roe, Irwin, and Morrow-Jones 2004).

Hypotheses

Several hypotheses regarding the variables were made prior to modeling. First, it was assumed that consumers would have a higher WTP for an organic version relative to a natural version given the extra, and generally favorably viewed, requirements that organic imposes on production. However, while information was included on a sheet accompanying the survey, it may still be that consumer understanding of the differences in the categories could be limited, as seen in Gifford and Bernard (forthcoming). If full understanding is absent, it could be that no significant difference between the two 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 that 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 strawberry preserves purchased at a farmers market versus purchased at a grocery store. 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) noted similar advantages for farmers markets, such as their being seen as a form of entertainment or chance to interact with farmers.

Results

Table 4 shows the results of the nested logit model. The variable *Local* was significant when interacted with both Maryland and Pennsylvania. The variable *NonLocal* was by itself significant, as well as when interacted with Maryland, Pennsylvania, and Virginia. Also significant were the variables *FarmMkt*, *Price*^{2}, *Organic*, and the interaction term *Price*FarmMkt*. Since not all the normalization constants are equal to 1, the nested logit model as opposed to the CLM was a better fit, as it relaxes the IIA assumption.

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 4,, graphs were created by state for the probability of each choice by price, for both purchasing venues and both production methods. Figure 2 shows the probabilities of each choice by price for the natural attribute and farmers market purchasing venue, for New Jersey, Delaware, and Pennsylvania, respectively. The natural/farmers market combination was selected since, as will be seen, these attributes held the highest value for consumers. Graphs for the organic and grocery store combinations did not show any unique differences and are not displayed.

As hypothesized, local and state program preserves were clearly preferred over non-local for all five states. The two former choices each were typically the preference of over 35 percent of consumers, with non-local the choice of only around 20 percent, across most price levels. However, the ranking between local and state program did vary by state. As can be seen in the first panel of Figure 2, New Jersey was the only state with respondents exhibiting a stronger preference for preserves identified by 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 percent level, it did lend weight to the notion that suggesting that the *Jersey Fresh* program, one of the most established and longest-running programs, has been able to successfully

Table 4. Nested Logit Results[a]

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	**<0.0001**
*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	**<0.0001**
FarmMkt	-0.2886	0.1133	**0.0108**
*Price*FarmMkt*	0.0579	0.0301	**0.0543**
Price	-0.0608	0.2168	0.7794
Price[b]	-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	**<0.0001**
NoPurchase[b]	1.0000	……….	………

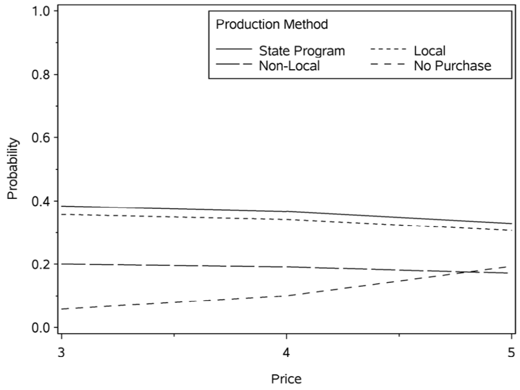
[a] Dependent variable is comprised of the predicted probabilities of choices $k = 1, 2, 3, 4$ given by $\text{PR}(k) = \text{P}(k|i)p(i)$.
[b] Normalization constants for a branch with one choice are fixed at 1.

Note: Variables in bold are significant at the 10 percent level or better.

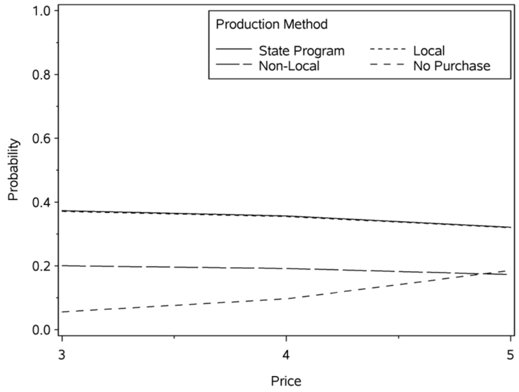
attract consumers and be competitive with the generic concept of local.

Delaware, in contrast, 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 the second panel of Figure 2, 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 effort would have been able to create the preference seen for the state program as witnessed for New Jersey.

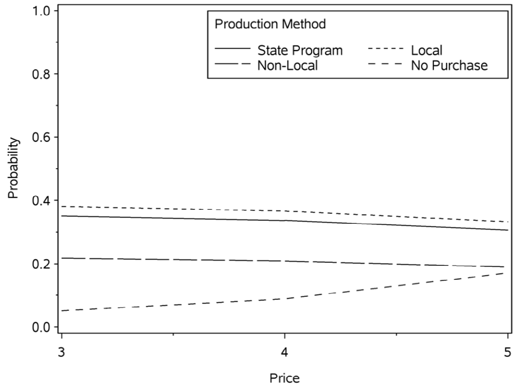
The opposite case of New Jersey was evident in Maryland, Pennsylvania, and Virginia, where respondents exhibited a stronger preference for preserves identified as "local" compared to those identified under each states' marketing program. As with the other states, these relationships held across purchasing venues and production methods. Pennsylvania, displayed graphically in the third panel of Figure 2, was a good example of



New Jersey



Delaware



Pennsylvania

Figure 2. Probability of Choice by Price: Natural and Farmers Market Attributes

these three, as consumer probability of purchase for local compared to state program preserves in that state was a near average of the probabilities for Maryland and Virginia. 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 policymakers. Virginia was perhaps the biggest surprise since, like New Jersey, its state program has existed a long time. Other factors, such as the effort at promotion, likely account for some of the differences between the two older programs.

Another key element in the above comparisons may be the size of the states. As previously hypothesized, the larger the state, the more likely consumers may view only a portion of the state to be local, and the more difficult it may be for state marketing programs to compete with local on just state identification alone. The two state programs that held up the best relative to local—Delaware and New Jersey—were also the two smallest Mid-Atlantic states. With Hu et al. (2010) suggesting that many consumers view "local" to mean within less than 100 miles, and Brown (2003) finding that in Missouri "local" was often viewed as a region smaller than the state's border, "local" may seem more supportive of a consumer's area than a state-wide promotion in larger states. It may then take additional effort for programs in Maryland, Pennsylvania, and Virginia to effectively capture local consumers.

Remaining elements of the graphs were more consistent. The probability of choosing the No Purchase option was less than 5 percent at the lowest price level for all cases. As expected, though, the probability did increase as price increased. By the time the upper price limit of five dollars was reached, the percentage of consumers selecting not to purchase was consistently near 20 percent. For New Jersey and Delaware, this option even surpassed the option of purchasing non-local preserves. One reason for this may be that at those price levels, consumers in those states in particular expect something extra from the product, such as being local.

Marginal Willingness to Pay

Marginal WTP (mWTP) estimates for all five states can be viewed in Table 5. These numbers show the amount a consumer would be willing to

Table 5. Marginal WTP by State and Price Level

	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

pay different from the base price for the given attribute change. Note first that, as should be expected, the mWTP numbers decline as the base price increases. As an example, consider consumer WTP to switch from non-local preserves to state program preserves at the grocery store for Delaware. At a base price of $3, the consumer would be willing to pay $1.33 more for the change, but willing to pay only $0.90 more at a base price of $5.

In terms of common findings, overall these estimates indicated a higher WTP across all five states for preserves from the farmers market than from the grocery store. Matching the original hypothesis, it appeared that consumers see extra intangible benefits to shopping at farmers markets, such as the ambiance of the farmers market and the ability to personally interact with farmers, as noted by Onianwa, Mojica, and Wheelock (2006) and Zepeda and Leviten-Reid (2004). Another possible explanation for this finding, although it is an area requiring further research, could be consumers' desire to support locally owned farms and businesses. Henneberry and Agustini (2004) surveyed consumers at 21 farmers markets in Oklahoma, and uncovered that one of the most important reasons cited by consumers for shopping at this venue was their desire to "support local farmers and businesses."

One fairly consistent, and unexpected, finding was a higher mWTP for natural preserves than for organic. With the exception of Maryland, all states failed to match the hypothesis of higher consumer WTP for organic. Even for Maryland, the premiums for organic were not especially large, with averages across the purchasing venues around 2.9 percent for preserves priced at \$3, 1.7 percent for those priced at \$4, and 1 percent for those price at \$5. For Delaware, natural and organic appeared to be viewed about the same, which would follow Gifford and Bernard (forthcoming) in the finding that consumers cannot tell the two categories apart. Results in Pennsylvania and, especially, Virginia, were more difficult to explain. It may be that many consumers prefer the more familiar natural option or do not see an advantage in organic for a processed product. Considering again the definitions from Table 2, organic features a number of attributes that are not relevant to strawberry preserves (e.g., GMO-free, no hormones and antibiotics, access to outdoors), and consumers may not be especially interested in these aspects. In contrast, the definition for "natural" focuses on attributes that may have had greater meaning to consumers when assessing strawberry preserves, such as the lack of artificial colors.[2] Further investigation comparing these attributes is warranted, including how presentation of their definitions matter.

Other results matched well with the findings from the analysis of the probabilities discussed above. For all states there was clear evidence of higher WTP over non-local for both local and state program. Even in Maryland, which exhibited the lowest mWTP to move from non-local preserves, consumers were willing to pay premiums of over 40 percent from a base price of \$3. Again, though, differences were between local and state programs. Similar to the earlier evidence, New Jersey was the only state with respondents clearly exhibiting a higher mWTP for preserves identified with the *Jersey Fresh* program compared to those identified as local. In terms of percentages, New Jersey respondents exhibited a mWTP of 6 percent more for state program over local preserves priced at \$3, 3.5 percent more at \$4, and 2.2 percent more at \$5. These numbers were very close between purchasing venues, with only slight extra premiums for farmers markets. In Delaware, only negligibly higher mWTP estimates of \$0.02, \$0.01, and \$0.01 were exhibited for preserves identified with the *Grown Fresh with Care in Delaware* program over those identified as local, for both purchasing venues.

Respondents in Maryland, Pennsylvania, and Virginia all exhibited a higher mWTP for preserves identified as local compared to their state's marketing program. At the extreme of the three, Maryland respondents exhibited an mWTP of 15 percent less for state program preserves priced at \$3, 8.5 percent less when priced at \$4, and 5.4 percent less when priced at \$5.00, for the grocery store venue. For the farmers market venue the gap was wider, with the corresponding numbers being 17.3 percent less, 9.3 percent less, and 5.8 percent less. In Pennsylvania, the differences were also largest for farmers market purchasing, with respondents exhibiting an mWTP of 8.3 percent less for state program preserves when priced at \$3, 4.5 percent less when priced at \$4, and 3 percent less when priced at \$5. These show that, at least for these states, state marketing programs need to do a much better job at promotion.

Conclusion

This study used a large-scale mail survey of the Mid-Atlantic states to examine consumer preferences and WTP for strawberry preserves that were either natural or organic and either local, state marketing program promoted, or non-local, across two purchasing venues. For the first comparison, only one state in this study, Maryland, exhibited a higher consumer preference for organic over natural. Either consumers in the Mid-Atlantic region lacked a full understanding of the meanings behind these terms or they were not interested in the attributes of organic, at least for strawberry preserves. Whether increasing interest in organic alone would alter this relationship was unclear. Producers and marketers looking to gain a price premium for organic products may need to incorporate some type of educational component into their promotional activities.

Undoubtedly, though, consumer preference for local existed in the Mid-Atlantic region. Both local and state program promoted versions had much greater WTP than non-local versions. A consumer ranking between the two non-local versions was much less clear. For the larger three states—Maryland, Pennsylvania, and Virginia—local appeared to be the preferred option for consumers. Whether or not the corresponding state programs are worth continuing may be a topic open for debate. Results here indicate that more generalized "buy local" promotions would be more effective, and could be targeted by county and/or state region. These findings also suggested that for larger states, consumers' definition of "local" is likely a region smaller than just the geographical borders of their state. It could be more beneficial then for these state marketing agencies to focus on local promotions on a county and state region level rather than just statewide.

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[2] While artificial ingredients and colors are also not allowed under organic, this part of the definition is not typically stressed and was therefore not included in the survey.

State marketing agencies in these three states may then decide that their programs are not worth continuing, such as was the case in Delaware. While there was virtually no difference in preferences for local or state program, Delaware's state marketing agency may have made a good decision by choosing to discontinue its program, as no premium for the state label was found to exist. As consumer interest in local continues, it will be interesting to follow whether state marketing programs will flourish or if many will follow Delaware's lead in disbanding. As New Jersey's program is well established and more heavily promoted than programs in other states, the state will likely continue building the program. The results of this study suggested that New Jersey was the only Mid-Atlantic state with a marketing program that could compete with a generic local claim. Producers and marketers eligible to use the *Jersey Fresh* logo 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, and is an area in need of further investigation.

Lastly, findings here back earlier research showing that farmers markets have an advantage in terms of consumer preferences and WTP. Specifically, results here indicated higher price premiums for products identified as local or state program promoted at farmers market venues than at grocery store venues. Producers and marketers then should be actively targeting farmers market venues in the 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. On the other side, it would be beneficial for grocery stores to try and better appeal to such consumers. For example, if consumers are attracted to farmers markets because of the opportunity to meet area farmers, grocery stores in the same area could similarly host local producers whose products they carry in-store.

An important extension of this research would be to consider fresh products. The relationships discovered here may or may not be the same with different classes of products. For example, knowing whether or not similar price premiums exist for fresh products at a farmers market venue as compared to value-added products would be helpful information for both marketers and producers. A study with a direct comparison, incorporating both fresh and value-added products, would also be a useful expansion of the research conducted here. Lastly, it may be useful to extend this research to other states or regions.

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