# Do Local Production, Organic Certification, Nutritional Claims, and Product Branding Pay in Consumer Food Choices?

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***Selected Paper prepared for presentation at the Agricultural & Applied Economics Association 2010 AAEA,CAES, & WAEA Joint Annual Meeting, Denver, Colorado, July 25-27, 2010***



This research was supported in part by the National Research Initiative of the USDA, CSREES, grant number 2005-35618-15646, and the Fred N. VanBuren Program in Farm Management at The Ohio State University.

Consumer interest in locally-grown food continues to grow, perhaps accelerating in the past few years with strong consumer food spending, high energy prices, greater recognition of the role of greenhouse gases in global warming, concern about the local and national economies as result of the recent recession, and a rapidly expanding promotional effort by local food producers and merchandizers. The number of farm and farmers markets increased by 167 percent from 1994 to 2008 (AMS, U.S. Department of Agriculture 2009). Food retailers, ranging from small local groceries to national chains, increasingly are marketing produce that is differentiated as produced locally. Whole Foods, the leading natural foods retailer in the United States, touts a variety of social, environmental and quality benefits (Whole Foods 2006). Forty-four state departments of agriculture administer programs that attempt to stimulate demand for foods produced or processed within the state's boundaries through state-sponsored labeling and promotion activities.[1] The trend is equally pronounced in the restaurant trade where 'locally grown produce' heads the list of 208 products and attributes ranked by U.S. chefs in 2009 (National Restaurant Association 2009).

Prior work by Ernst and Darby (2008) indicated that, not only did locally grown produce capture a consumer premium, but that an *Ohio Proud* label was a useful proxy for locally-grown products and created significant influence in consumer choice when comparing both to U.S. product and imported products. Similar work by Darby and Ernst (2007); and McNaull (2007) also illustrated premiums to local labeling in both fresh and processed berries. Complimentary trends were illustrated in a pilot study of willingness to pay for breed preservation through the purchase of Heritage Pork products (Sanders 2008).

The purpose of this paper is to further the assessment of consumer demand for locally produced foods, along with a host of other food attributes that may interact to influence consumer utility. Specifically, we evaluate a number of different measures of local production, assessing the potential for complementarity among these product attributes. We also consider a product that is processed rather than fresh, allowing judgment about whether or not local production is valued for such items, and what the extent of local for such products. Using stated preference data from a choice-based conjoint analysis survey instrument, we estimate willingness-to-pay for processed food products (using blackberry jam as a representative product) that are differentiated with respect to their branding, the location of their production, certification as organically produced, branding as a product of a small family farming association, and carrying a *State Proud* certification. These estimates provide insight into the value that households place on each attribute, allow us to estimate the impact of "state proud" programs on the buy local movement, and to assess sub-state regional food identities as they influence consumer choice.

The rest of the paper is organized as follows: The next section offers a brief review of the conjoint methodology and develops a utility-theoretic model of product choice from which a measure of compensating variation is derived. Following this is a description of the sample, survey and experimental design, and the empirical model. Next, we report the results from the estimation of the utility model and the resulting compensating variation estimates. The final

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[1] Based on the authors' survey of 50 state agricultural department's websites during August, 2006.

section is a discussion of the implications of our results on the marketing of locally produced foods.

## Conjoint Analysis

Conjoint analysis (CA) is a term given to a suite of stated preference elicitation methods in which the researcher identifies key attributes of a product of interest that are believed to influence respondent preferences, formulates numerous profiles of the product featuring permutations of key attribute levels according to an experimental design, prompts respondents to evaluate various product profiles, analyzes respondents' evaluations of the product profiles to draw inferences concerning preferences over attributes, and uses the estimated preference structure to evaluate scenarios of interest (Hensher, Louviere, and Swait, 2000).

The application of conjoint analysis, sometimes also referred to as a choice experiment, has become increasingly popular in studies on food marketing. Hu, Adamowicz, and Veeman (2006) examined tradeoffs consumers make between nationally- and store-branded products. Loureiro and Umberger (2007) looked at the issue of food safety, country of origin and traceability in beef. Nganje showed that perceptions of food safety vary based on income, age, and urban residence. Scarpa found unobserved heterogeneity in a latent class model of Region of Origin labeling on olive oil and grapes in Italy. Darby et al. (2008) and Hu, Woods and Bastin (2009) focused on consumer preferences for locally produced food. Bond, Thilmany and Bond (2008) investigated the role of nutrition and health claims in consumer choices. Darby (2008) found that gender and age are significant sources of heterogeneity in willingness-to-pay for locally-grown food. Carlsson, Frykblom and Lagerkvist (2007) assessed consumer willingness to pay for product features that are linked to animal welfare. Many of the above studies also examined consumer preference for organic food.

## Conjoint Modeling

In our model of product choice we assume the individual's indirect utility functions can be approximated as a linear function of net income, product attributes and interaction terms:

$$(1) \qquad V_j^i(M^i - P_j, \mathbf{A_j}, \mathbf{S_j}^{\mathbf{i}}, e_j^i) = \boldsymbol{\alpha L} + e_j^i$$

where $V_j^i$ denotes individual $i$'s indirect utility from choosing product $j$; $M^i$ is respondent $i$'s annual household income; $P_j$ is the price of product $j$; $\mathbf{A_j}$ denotes a column vector of attributes associated with product $j$; $\mathbf{S_j^i}$ denotes a column vector of interaction terms, which may include interactions between product attributes as well as interactions between product $j$'s attributes and household $i$'s characteristics; $\boldsymbol{L}=[M^i - P_j \;\; \mathbf{A_j}^T \; (\mathbf{S_j^i})^T\,]^T$ is a column vector of regressors; superscript $T$ denotes the transpose operator;

$\boldsymbol{\alpha} = [\alpha_M \; \boldsymbol{\alpha_A} \; \boldsymbol{\alpha_S}]$ is a row vector of coefficients to be estimated; and $e_j^i$ denotes a disturbance term.

When faced with a choice of two products, the individual chooses the one expected to provide the highest utility. Here each individual's choice set contains two products so we model the choice decision based on the difference in utility. Thus framed, the utility difference between product *x* and *y* is:

(2) $$dV_{xy}^{i} = \boldsymbol{\alpha}\Delta(\mathbf{L}) + \varepsilon_{xy}^{i} = -\alpha_M\Delta(P) + \boldsymbol{\alpha_A}\Delta(\mathbf{A}) + \boldsymbol{\alpha_S}\Delta(\mathbf{S^i}) + \varepsilon_{xy}^{i}$$

where $\Delta(k) = k_x - k_y$, $\varepsilon_{xy}^{i} = (e_x^i - e_y^i)$ and $\varepsilon_{xy}^{i}$ is assumed to be normally distributed. Following Johnson and Desvousges (1997), we include interaction terms between product attributes and households; this allows for measurement of differences in preferences for product attributes across different types of households. When $dV_{xy}^{i} > 0$ respondent *i* chooses product *x*, and the probability that respondent *i* chooses product *x* rather than product *y* is

(3) $$\text{prob}(dV_{xy}^{i} > 0) = \Phi(\boldsymbol{\alpha}\Delta(\mathbf{L})),$$

where Φ(.) is the normal cumulative distribution function.

We implicitly define the willingness-to-pay (compensating variation in our case), *C*, for a change in attributes from $\mathbf{A_x}$ to $\mathbf{A_y}$ for individual *i* as:

$$V_x(M^i - P_x, \mathbf{A_x}, \mathbf{S_x^i}) = V_y(M^i - P_y - C, \mathbf{A_y}, \mathbf{S_y^i}),$$

where $\mathbf{S_x^i}$ and $\mathbf{S_y^i}$ are the vectors of interaction terms corresponding to the vectors of product attributes $\mathbf{A}_x$ and $\mathbf{A}_y$ respectively. That is, if *C* was subtracted from the income of an individual evaluating a product *y* with attributes $\mathbf{A}_y$ and price $P_y$, the individual's expected utility would equal that from product *x* with attributes $\mathbf{A}_x$ and price $P_x$. In other words, if the change in attributes from $\mathbf{A}_x$ to $\mathbf{A}_y$ were welfare increasing, an individual would be willing to pay *C* more than $P_y$ to bring about the change in the attributes. Alternatively, if the change in attributes were welfare decreasing, an individual would have to be paid *C* to accept the change in attributes.

Given the functional form in (2), a closed-form solution for *C* can be derived:

(4) $$C = -[\boldsymbol{\alpha_A}\Delta(\mathbf{A}) + \boldsymbol{\alpha_S}\Delta(\mathbf{S^i})]/\alpha_M + \Delta(P).$$

We use the expressions for compensating variation in (4) to estimate individuals' willingness-to-pay for the key product attributes. For simplicity, we will assume during these calculations that the price of the base and alternative products are equal (e.g., $\Delta(P) = 0$).

**Survey and Empirical Methods**

The data used in this paper are drawn from responses to a survey instrument administered to random samples of 3,000 residents, aged 18 and older, in each of the states Ohio and Kentucky, USA. The mailing list was purchased from Survey Sampling International. The study employed a mailed survey, was conducted during the period October - December 2008, and followed best survey practices (Dillman 2006). In order to guarantee sufficient representation of respondents in each of three regions in each state, 1,000 contacts were made in each region (figure 1). Sample responses were then post-stratified by respondent gender and age based on the 2000 decennial census. We received an overall response rate of 34.5 percent. A total of 1,972 respondents are included in the results reported herein. Descriptive statistics for the sample, with comparisons to the 2007 American Community Survey (U.S. Census Bureau), are reported in table 1. Results suggest that our post-stratified sample had an appropriate number of male and female respondents, but somewhat under-represented non-white residents. Respondents in the youngest age category were somewhat under-represented in both states, and consumers older than 65 years were modestly over-represented. As is typical for mailed survey respondents, average age was higher for the sample than for the census. Still, we judge the sample to be a reasonable representation of the population of the two states.

*Survey and Question Design*

The survey began with the conjoint experiment. Specifically the preface to the conjoint question (figure 2) asks the respondent to suppose they were choosing between two 12 ounce jars of blackberry jam that were equivalent in all aspects except those attributes subsequently described. Two product profiles, presented side-by-side, provide information on seven attributes: the brand of jam, presence/absence of organic certification (four levels), presence/absence of a *state proud* logo, presence/absence of a (fictitious) small family farming association logo, presence of nutritional claims, identification of the sub-state region of production, and purchase price ($3.00, $3.25, $3.60, $4.10 or $5.00). The full listing of attributes and their experimental levels are listed in table 2.

Respondents were asked to state whether they: preferred product 1, product 2, or indicated an unwillingness to purchase either product. The survey also elicited key demographic variables including household income, typical food expenditure levels, education, and age. A list of the definitions of variables included in the final model is provided in table 3.

*Experimental Design*

To generate the product profiles used in the survey we use a variation of a standard full-factorial design. A standard full-factorial approach (see Hensher, Louviere, and Swait, 1999 for an overview) begins by generating a pool of product profiles that includes all possible permutations of attribute levels. If this number is small, a respondent is asked to evaluate all permutations; analysis of the resulting choices allows for inference concerning the main effects of all attributes of the respondent's preferences as well as all possible interactions among attributes (i.e., first-order as well as all higher-order interactions).

As the number of attributes and attribute levels increase, however, the number of profiles grows exponentially and no single respondent can evaluate all permutations. Hence, the researcher randomly assigns subsets of profiles from the full factorial design to each respondent. If the researcher wants to infer individual preference structures, each respondent is typically assigned a large enough subset of profiles such that the main effects of attributes on preferences can be recovered. Such a subset is typically generated by an orthogonal fractional factorial design (Green and Srinivasan 1990). If respondents can effectively evaluate larger numbers of profiles, the design can be augmented such that key first-order interaction terms can also be consistently estimated.

If, as in our case, individual level full preference structures are not obtainable (e.g., if each respondent can only be asked to evaluate a limited number of profiles), then each respondent is randomly assigned several profiles from the full factorial design. Because a common utility function is assumed for all respondents, all levels of interaction terms can be estimated for the common utility function.

A total of 3,600 product profiles (5 price levels x 3 brand descriptions x 5 regional locations x 4 organic certification levels x 2 State Proud levels, x 2 small family farm producer association levels x 3 nutritional claim levels) were generated. Three pairs of product profiles were randomly selected to be presented to each survey recipient. To make the design more efficient, product profile pairs were individually checked; we removed pairs that featured identical profiles or pairs that featured one dominating profile (e.g., all attributes were equal except for price).[2] The average values of the differences in these attributes for the pair of products presented are summarized in table 3 for the observations used in estimation. The experimental design was implemented in the mailed survey using variable printing techniques: Each survey printed was unique with respect to the three experiment replications. Hence, every respondent viewed a unique set of products.

*Model Estimation*

Each respondent was asked to cast three decisions during the conjoint questioning for a potential of 5,916 usable responses. Some respondents failed to complete one or more experiments, for a total of 145 missing experimental responses. Furthermore, for 865 conjoint choices, individuals answered that they would not select either of the products; these responses were omitted from the analysis. This yielded 4,906 usable conjoint choices for analysis. Statistical analysis of the model proceeds by estimating the utility difference model using a binomial probit estimator. We model the probability that the respondent chooses the product shown on the left side of the conjoint graphic (figure 2).

## Results

Our sample of consumers was drawn randomly, but from two neighboring states. Because consumers in these two states may differ in culture, experiences, and other unmeasured features, it is possible that these consumer groups will differ in important ways regarding food product preferences. Additionally, there are significant known cultural differences between cities and rural/agrarian communities, Appalachian regions and the Ohio River Valley in both states. To test the regularity of preferences between these sub-samples, models were estimated separately and a likelihood ratio test was used to test for differences based on state of residency. Our results suggested that there is no systematic difference in response between consumers in the two states ($p \leq 0.10$), and thus we pool these groups and estimate a single model. Table 4 displays the results

[2] This procedure is referred to as creating Pareto optimal stimulus sets (see Krieger and Green, 1988, and Wiley, 1977). Huber and Hansen (1986) showed that using Pareto optimal stimulus sets improved predictive ability of the estimated preference model.

of the final probit model for the pooled sample. The model is highly significant, as indicated by the chi squared statistic of 1,919. The model correctly predicted 75.7 percent of the choices made by consumers in our experiments.

The price variable measures the price differential for the two products, ranging from $-2.00 to $2.00. As expected, this variable displays a negative sign and is statistically significant ($p \leq 0.01$). The marginal effects estimate suggests that an increase of $1 in the price of a blackberry jam product, with all else equal, will result in a 36.0 percentage point decrease in the likelihood that the blackberry jam product will be selected relative to an equivalent, but less expensive, competing product.

The brand name of the jam product was expected to influence consumers' choices. Three levels were identified for this attribute. In our model, national brands (e.g., Smucker's, Welsh's) and regional brands (e.g., Windstone Farms) were identified with binary variables, with store brands (e.g., Kroger, Wal-Mart) as the excluded attribute level. National brands were significant ($p \leq 0.01$) and positively signed, with a marginal effect estimate that suggests the national brand product was 16.1 percentage points more likely to be selected relative to the store branded product, with all else equal. The part-worth utility for regional brand products was not statistically different than zero ($p \leq 0.10$), thus suggesting no difference in preference between the regional brand and store brand products. The lack of statistical significance for the regional brand was somewhat of a surprise. We hypothesized that regional brands would signal local production, and would command a premium in the marketplace. Perhaps the negative (relative to national brands) impact is due to a lack of knowledge of the regional brands as being locally produced, per se, relative to the nearly universally known national brands which are supported by extensive promotion. On the other hand, a store brand may not provide the regional association but such a brand may also be well known to consumers who frequent the store. This suggests that risks associated with purchasing an unknown local processed food product, all else equal, may overwhelm the local signal that may be embedded in the regional product. Conversely it suggests that local branding efforts need to clearly identify their “locality” if to truly capture any local premiums. The results seem to suggest there may be a “stuck-in-the-middle” market positioning dilemma for smaller processors that are targeting a market catchment larger than their state but lacking ability to pursue national scale promotions.

Organic certification of the jam product was represented as an attribute with four levels. This attribute was represented with three binary variables. The USDA National Organic Program (NOP) logo can appear on the label of any product certified to contain at least 95 percent organic contents by volume (figure 3). The highest level of organic content was signified by the presence of the NOP organic seal, along with the words "100% organic". A third level was indicated by the words "made with organic blackberries" appearing on the label. The excluded attribute category was the absence of information regarding organic content (a blank label field).

The part-worth utility for 100% organic certification was significant ($p \leq 0.01$) and positive. With all else equal, presence of the 100% organic certification increased the probability that a product would be selected by 12.2 percentage points. Products "made with organic blackberries" also were significantly ($p \leq 0.05$) more likely to be selected; such products were 3.7 percentage points more likely to be selected that products with no information about organic content. Appearance only of the NOP seal (at least 95% organic) did not influence the choice among products. This suggests that consumers may not well understand the meaning of the NOP seal in the absence of words describing level of organic content. This result may also hold important implications for food processors that choose the level of organics for their multi-ingredient food products. To claim 100% organic content means that all ingredients must be sourced from organic providers. Some processor may stop short of the 100% organic claim either because of the heightened burden of documenting that all minor ingredients are organic, or because some minor ingredients may be difficult and costly to obtain. The fact that these results suggest consumer are substantially more likely to select products which are 100% organic, and willing to pay more for these products, may suggest that it may pay to source all ingredients organically. If it is not practical to source at the 100% organic level, a listing of key ingredients (e.g., made with organic blackberries) in addition to the NOP seal may be helpful.

Previous work by Darby *et al*. (2008) has suggested that consumers are more likely to select products produced by small family farms. To test this in the current experiment, a fictitious Small Family Farming Association (SFFA) Logo (figure 3) was either present or absent on the label. The part-worth utility estimate was significant ($p \leq 0.01$) and positive. The marginal effect estimate suggests that, with all else equal, presence of the SFFA logo on one product increased the likelihood that the product would be selected by 4.8 percentage points. Merchandising production as being tied to a small family farm in some fashion would seem to be a meaningful opportunity for some products.

Increasingly, consumers make their choice of foods based on known or suggested nutritional characteristics or health claims (Bond, Thilmany and Bond 2008; Lusk and Briggeman 2009). Firms have several options with which they can merchandise nutrition on their product labels. We test the impact with the inclusion of a three-level nutrition claim attribute in the experiment. A generic claim that (all) blackberry products "contain high levels of healthful Antioxidants" is represented by a binary variable. A firm-specific claim unique to their particular product stating that "our recipe results in higher levels of healthful Antioxidants" is represented as a second binary variable. These kinds of unique claims typically represent some sort of proprietary process protected by a particular firm. The excluded case in the model is the absence of a nutritional claim. Our results suggest that only the generic claim is statistically significant at the 0.10 level. The presence of the generic claim increased the likelihood that this product would be selected (relative to an identical product without the claim) by 3.0 percentage points. Somewhat surprising was the lack of significance of the firm specific claim. Perhaps this is due in part because the firm specific claim requires trust in that firm, whereas the generic claim simply is a statement of fact that is recognized by the consumer to be more readily validated by independent sources and relates to any blackberry product.

The remaining two attributes provide an indication of local production. One attribute indicates the presence or absence of a Kentucky (or Ohio) Proud logo. The presence of this logo signifies products that are "raised, grown or processed" within the named state. The Kentucky Department of Agriculture describes their program as a "buy local" initiative. This attribute was present at two levels -- state proud logo (the appropriate Kentucky or Ohio Proud logo was used for each corresponding state sample) was present or absent on the label.

A second location attribute was included with five levels represented to examine the scope of the impact of geographic indication on the consumer perception of value. Three regions were identified in each state, with names that were reflective of the location of that region. Regions were selected to approximate distinct cultural catchment areas within each state. Each was represented in the model as a binary variable. Region A represented the western 36 counties of Kentucky and the northwest 29 counties of Ohio. Region A in both states represents the Corn Belt region of each state, and tends to be rural in character. Region A represents 25% of Kentucky's population and 26% of the Ohio population. Region B represents the central (Bluegrass) region of Kentucky (46 counties) and the north-central 29 counties of Ohio. Region B includes the larger metropolitan areas of both states, and represents over half of the Kentucky (53%) and Ohio (54%) populations. Region C represents the Appalachian regions of both states (28 and 30 counties in Kentucky and Ohio, respectively). These regions have the lowest population density in both states, representing 22% of Kentuckians and 20% of Ohio's populations. In addition to the state regional identification, products also could be identified as a product of the Ohio Valley -- an undefined region that conceivably could include products of six states -- Pennsylvania, West Virginia, Ohio, Kentucky, Indiana, and Illinois. The excluded attribute level was the absence of product location information on the label.

The State Proud and product location attributes were independently drawn for the experiment. That is, the State Proud logo could appear or not appear with each location attribute level. To test for interaction of the impact of these two product attributes, interaction terms were included in preliminary models. These terms were not statistically significant and were excluded in the final model. The presence of the State Proud logo was significant ($p \leq 0.01$) and positive: The presence of this logo, with all else unchanged, resulted in a 4.7 percentage point increase in the likelihood that a given blackberry jam product would be selected.

Regional location of production was even more important. The part worth utility estimates for all three state regions and the Ohio Valley region were statistically different than zero ($p \leq 0.01$). Products identified with the Appalachian region (C) had the largest part-worth utility estimate, followed closely by region A. Products identified as produced in region A (C) were 11.5 (12.2) percent more likely to be selected than a product which contained no information about where it was produced. It is noteworthy that these two regions represent the most rural portions of both states. An indicator that a product was produced in region B of the state resulted in a 8.7 percentage point hike in the likelihood of selection relative to an identical product with no production location claim. Although substantially smaller than the state region indicator, products produced in the Ohio Valley also were 7.5 percentage points more likely to be selected ($p \leq 0.01$) than products with no production location. It is noteworthy that the part-worth utility of an Ohio Valley product is larger than that associated with the State Proud logo. We could hypothesize numerous reasons for this, but this finding does tend to very strongly support the need for clarity in any regionalized identity.

We also included an interaction term to test if the consumer was more likely to select a product produced in the region of the state in which they reside. This parameter estimate was not significantly different than zero ($p \leq 0.10$). Thus, consumers in this experiment did not particularly value products of their own region any more than those from another region or bearing no production location information. This reinforces the finding by Darby *et al* (2008) that for fresh strawberries, consumers viewed that fruit produced within the boundaries of the state was considered to be local.

Table 5 provides willingness-to-pay estimates for the various attribute levels. Following Louviere, Hensher and Swait (2000), these are calculated as the part-worth utility for the various attribute level divided by the negative of the marginal utility of income (negative of the regression coefficient for price). With all else equal, consumers were willing to pay $0.45 more per jar for nationally branded jam than for jam with a store brand. Jams labeled as 100% Organic were worth $0.34 more to the average consumer than an identical jam without organic certification; Jams "made with organic blackberries" would command a premium of 10 cents more per jar.

Our experimental results suggest that consumers are willing to pay modestly higher prices for foods clearly identified as produced by small family farms. The estimated WTP for this attributes was 13 cents per jar relative to jam that contained no such producer type information. Likewise, generic nutritional claims were worth 8 cents per jar more than jams without such claims.

A key focus of this experiment was to evaluate alternative signals of local production. Presence of the state proud logo was valued at 13 cents per jar, with all else equal. However, identification as a product of the Appalachian region was worth substantially more -- 34 cents per jar. Because these two attributes were independently displayed in the experiment, and there were no significant interaction effects for these attributes, these two values are additive. Thus, we estimate that consumers were willing to pay 47 cents more per jar for the jam product that displays both Appalachian region designation and the state proud logo.

**Summary and Conclusions**

This research provides an indication of the relative importance of a number of attributes on consumer choice for a processed, multi-ingredient food product -- blackberry jam. Price is the most important single attribute influencing consumer choice for our sample. National branding of the product also was relatively important in consumer choice. The presence of a national brand label resulted in significantly higher probabilities of product selection relative to either a store brand or a regional product brand identification. Previous studies (Darby et al 2006, Hu 2007) have shown that taste is the single most important attribute in repeated purchases of a food, and consumers are more likely to have had experience with a nationally branded food product than with a small distribution, regional brand. Our results also supported the notion that consumers are willing to support small family farms with purchases if the product is clearly labeled as a product of small farms. However, the presence of a small family farming association logo only resulted in small (4.8%) increases in the likelihood of purchase and very modest willingness to pay premiums (13 cents per jar).

Organic certification also proved to be relatively important: in our experiment, 100 percent organic content certification increased the likelihood that a product would be selected by 12.2 percentage points, with all else equal. We did not explain the NOP organic seal to our survey participants in prelude to our experiment. Thus, we relied on their prior knowledge of the symbol as they made their selection. The presence only of the NOP organic seal, which signifies a product of at least 95 percent organic content, was not significantly different from the product with no organic certification information. This, combined with the fact that products bearing the words "100% organic" or "made with organic blackberries", were statistically more likely to be selected, suggests that consumers may not understand the meaning of the NOP seal.

A key focus of this experiment was to evaluate alternative signals of local production. Three primary signals were tested as separate attributes. The first was a regional product name, which in our model was not statistically significant. The second was the presence of a *Kentucky Proud* or *Ohio Proud* logo. The presence of such a logo significantly increased the likelihood that a product would be selected -- to the tune of about five percentage points. More important still was a regional product identification. Knowledge that the product was produced within the state enhanced the likelihood that the product would be selected by as much as 12 percentage points. The typical consumer was willing to pay on the order of 34 cents more per jar of jam for a product labeled as produced in the Appalachian region of Kentucky or Ohio. Our results suggest that the respondent was no more likely to purchase a product that was produced in their region of the state than produced elsewhere in the state. This underscores the notion that production within the state is viewed as "local".

In today's world, as far as actual marketing practices and academic research go, beyond just the simple factor of price consumers are often confronted with alternate/competing food quality concepts such as branding, local production, organic, origin of product, and nutrition and health claims. Many of these quality attributes could also be presented in a variety of ways. These may not only generate comprehension issues for consumers, they pose a challenge to researchers to truly understand consumer preferences in this fast moving trend. This study fills the void in the literature by disentangling many of these attributes thus allows researchers to obtain their relative importance individually.

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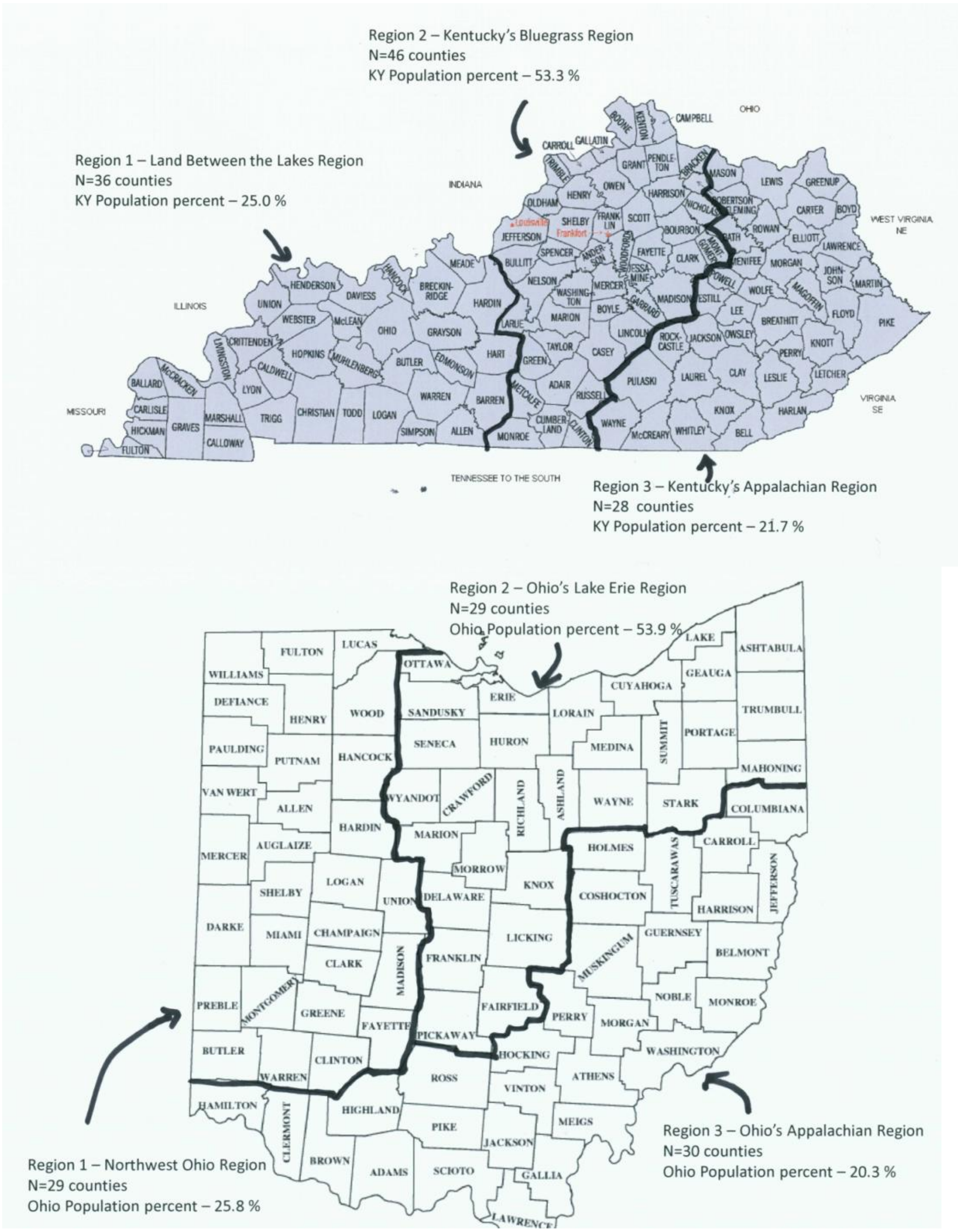


Figure 1. Regional maps of Kentucky and Ohio.

We would now like to ask you to make some product choices just as if you were shopping. In each case, there are two products and we ask you to select the one you most prefer, or indicate that you would not be willing to purchase either.

**Situation:** Imagine that you are shopping for groceries at your usual grocery store. One item that you plan to purchase is a jar of blackberry jam. On the grocery shelf you see two blackberry jam products. They are identical in size (12 ounces) -- the only differences are those identified on the label. We ask you to review these and indicate which of the products you would choose to purchase. Please remember that you, as do all consumers, have a limited amount of funds available for food purchases. Try to make your purchase decision just as you would in real life.

**Choice set 1**

| Jam A | Jam B |
| --- | --- |
| National Brand (e.g., Smucker's, Welch's) | Store Brand (e.g., Kroger, Wal-Mart) |
| Made with Organic Blackberries | USDA ORGANIC 100% Organic |
| OHIO PROUD Made in Ohio • Grown in Ohio | |
| | Small Family Farmers Association |
| A Product of Ohio's Lake Erie Region | A Product of Ohio's Appalachian Region |
| Our recipe results in higher levels of healthful Antioxidants. | Blackberries contain high levels of healthful Antioxidants. |
| $ 4.10 | $ 3.60 |

Given the information provided above, which of the jam products would you purchase (if any)? Check one.

☐ Jam A ☐ Jam B ☐ I would not purchase either product

Figure 2 - experiment scenario and choice options.

| | | | | |
|---|---|---|---|---|
| USDA ORGANIC 100% Organic | USDA ORGANIC | Kentucky Proud | OHIO PROUD Made in Ohio · Grown in Ohio | Small Family Farmers Association |
| NOP organic seal with 100% organic designation | NOP organic seal | Kentucky Proud logo | Ohio Proud logo | Small Family Farmers Association logo (fictitious) |

Figure 3 -- Logos appearing as attributes in the conjoint experiment.

Table 1. Demographic Characteristics of Representative Sample

| | Kentucky | | Ohio | |
|---|---|---|---|---|
| Variable | Sample | State | Sample | State |
| Number of respondents | 961 | 4,205,648 | 1011 | 11,463,403 |
| Female (%) | 52.7 | 51.1 | 51.8 | 51.3 |
| White (%) | 97.0 | 89.2 | 93.0 | 84.0 |
| Age | | | | |
| 20-24 | 8.0 | 9.0 | 3.2 | 9.2 |
| 25-34 | 18.9 | 18.5 | 18.9 | 17.3 |
| 35-44 | 21.4 | 19.7 | 22.5 | 19.5 |
| 45-54 | 18.8 | 20.0 | 19.9 | 20.7 |
| 55-64 | 12.9 | 15.2 | 13.2 | 15.0 |
| 65-74 | 10.1 | 9.4 | 10.9 | 9.3 |
| 75-84 | 7.1 | 6.0 | 8.3 | 6.6 |
| 85 and older | 2.8 | 2.2 | 3.2 | 2.5 |
| Population 25 years and over (distribution) | | | | |
| Less than 9th grade | 1.4 | 8.9 | 0.7 | 3.6 |
| 9th to 12th grade, no diploma | 5.6 | 11.8 | 4.4 | 10.1 |
| High school graduate (includes equivalency) | 24.4 | 34.8 | 23.4 | 36.9 |
| Some college, no degree | 21.5 | 18.5 | 21.4 | 19.1 |
| Associate's degree | 11.7 | 6.3 | 12.5 | 7.0 |
| Bachelor's degree | 21.7 | 11.7 | 23.1 | 14.8 |
| Graduate or professional degree | 13.7 | 8.0 | 14.5 | 8.5 |
| Household Income (distribution) | | | | |
| Less than $10,000 | 8.5 | 11.1 | 2.4 | 8.3 |
| $10,000 to $14,999 | 7.4 | 7.7 | 6.1 | 6.1 |
| $15,000 to $24,999 | 7.2 | 13.5 | 7.4 | 11.8 |
| $25,000 to $34,999 | 13.0 | 12.1 | 9.4 | 11.8 |
| $35,000 to $49,999 | 15.2 | 15.4 | 15.9 | 15.5 |
| $50,000 to $74,999 | 20.3 | 18.0 | 24.6 | 19.6 |
| $75,000 to $99,999 | 14.5 | 10.4 | 16.0 | 11.9 |
| $100,000 to $149,999 | 11.7 | 8.0 | 12.9 | 9.9 |
| $150,000 to $199,999 | 1.1 | 2.1 | 3.3 | 2.8 |
| $200,000 or more | 1.2 | 1.7 | 2.1 | 2.3 |
| Mean Household Income (dollars) | 57,760 | 53,337 | 70,573 | 60,224 |

Note: State population statistics are based on the 2005-2007 American Community Survey 3-Year Estimates (U.S. Census Bureau). Household income numbers are expressed in 2007 inflation adjusted dollars

Table 2. Product Attributes used as Variables in Conjoint Experiment

| Product Attribute | Levels |
|---|---|
| Brand | National Brand (e.g., Smucker's, Welch's) |
| | Store Brand (e.g., Kroger, Wal-Mart) |
| | Regional Brand (e.g., WindStone Farms, Dickinson's) |
| Organic certification | 100% organic |
| | At least 95% organic content |
| | Made with Organic Blackberries |
| | [blank] |
| State Proud | Ohio (or Kentucky) Proud Logo |
| | [blank] |
| Small firm claim | Small Family Farming Association logo |
| | [blank] |
| Regional claim | A Product of Ohio's Lake Erie Region (Kentucky's Land-Between-the-Lakes Region) |
| | A Product of Northwest Ohio (Kentucky's Bluegrass Region) |
| | A Product of Ohio's Appalachian Region (Kentucky's Appalachian Region) |
| | A product of the Ohio Valley |
| | [blank] |
| Nutritional claim | Blackberries contain high levels of healthful Antioxidants. |
| | Our recipe results in higher levels of healthful Antioxidants. |
| | [blank] |
| Price ($/12 ounce jar) | Five levels: 3.00, 3.25, 3.60, 4.10, 5.00 |

**Table 3. Summary Statistics for Model Variables (N = 4,906)**

| Variable | Definition | Mean | Std. Dev. | Min. | Max. |
|---|---|---|---|---|---|
| CHOICE | =1 if product displayed on left is preferred | 0.488 | 0.500 | 0 | 1 |
| Price | Price per 12 oz jar | 0.029 | 0.979 | -2 | 2 |
| National brand | =1 if a national brand (e.g., Smucker's, Welch's) | 0.011 | 0.679 | -1 | 1 |
| Regional brand | =1 if a regional brand (e.g., Windstone Farms) | -0.013 | 0.668 | -1 | 1 |
| 100% organic seal | =1 if 100% organic | -0.004 | 0.621 | -1 | 1 |
| 95% organic seal | =1 if organic logo (at least 95% organic) | 0.001 | 0.626 | -1 | 1 |
| Made with organic berries | =1 if "Made with Organic Blackberries" | 0.002 | 0.615 | -1 | 1 |
| Displays small family farm logo | =1 if displays Small Family Farming Association Logo | -0.001 | 0.716 | -1 | 1 |
| Generic nutrition claim | =1 if label states "Blackberries contain high levels of healthful Antioxidants" | 0.005 | 0.668 | -1 | 1 |
| Firm specific nutrition claim | =1 if label states "Our recipe results in higher levels of healthful Antioxidants" | 0.008 | 0.645 | -1 | 1 |
| Displays *State Proud* Logo | =1 if displays the Ohio (or Kentucky) Proud Logo depending on whether the survey was sent to an Ohio or Kentucky resident | 0.018 | 0.725 | -1 | 1 |
| Produced in state region A | =1 if labeled as a product of State Region A | 0.003 | 0.583 | -1 | 1 |
| Produced in state region B | =1 if labeled as a product of State Region B | -0.013 | 0.578 | -1 | 1 |
| Produced in state region C | =1 if labeled as a product of State Region C | -0.010 | 0.565 | -1 | 1 |
| Produced in the Ohio Valley Region | =1 if labeled as a product of the Ohio Valley | 0.006 | 0.549 | -1 | 1 |
| Produced in my region | =1 if the product is produced in region in which respondent lives | -0.009 | 0.569 | -1 | 1 |

Note: all variables are defined as the difference in the attributes between the product on the left and the one on the right.

**Table 4. Utility Function Parameter Estimates**

| Variable | Coefficient Estimate | Marginal Effect | P[\|Z\|>z] |
|---|---|---|---|
| Constant | -0.018 | -0.007 | 0.392 |
| Price | -0.904 | -0.360 | 0.000 |
| National brand | 0.403 | 0.161 | 0.000 |
| Regional brand | -0.035 | -0.014 | 0.327 |
| 100% organic seal | 0.306 | 0.122 | 0.000 |
| 95% organic seal | 0.044 | 0.018 | 0.272 |
| Made with organic berries | 0.094 | 0.037 | 0.021 |
| Displays small family farm logo | 0.121 | 0.048 | 0.000 |
| Generic nutrition claim | 0.076 | 0.030 | 0.032 |
| Firm specific nutrition claim | 0.047 | 0.019 | 0.202 |
| Displays *State Proud* Logo | 0.118 | 0.047 | 0.000 |
| Produced in state region A | 0.290 | 0.115 | 0.000 |
| Produced in state region B | 0.217 | 0.087 | 0.000 |
| Produced in state region C | 0.305 | 0.122 | 0.000 |
| Produced in the Ohio Valley Region | 0.170 | 0.068 | 0.000 |
| Produced in my region | 0.001 | 0.000 | 0.976 |
| N | | 4,906 | |
| Log Likelihood Function | | -2,440 | |
| Restricted Log Likelihood | | -3,399 | |
| Chi Squared | | 1,919 | 0.000 |
| Percent correct prediction | | 75.7 | |

Note: all variables are defined as the difference in the attributes between the product on the left and the one on the right

**Table 5. Willingness-to-Pay Estimates ($/Jar)**

| Attribute | Willingness-to-pay |
|---|---|
| National brand | 0.45 |
| Regional brand | 0.0[a] |
| 100% organic seal | 0.34 |
| 95% organic seal | 0.0[a] |
| Made with organic berries | 0.10 |
| Displays small family farm logo | 0.13 |
| Generic nutrition claim | 0.08 |
| Firm specific nutrition claim | 0.0[a] |
| Displays *State Proud* logo | 0.13 |
| Produced in state region A | 0.32 |
| Produced in state region B | 0.24 |
| Produced in state region C | 0.34 |
| Produced in the Ohio Valley Region | 0.19 |
| Produced in my region | 0.0[a] |

a The part-worth utility was not significantly different than zero.