# Evaluating the Marketing Impact of a Regional Branding Program Using Contingent Valuation Methods: The Case of the Appalachian Grown™ Branding Program

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## Introduction

Western North Carolina is home to nearly 12,000 farms, about one-quarter of the farms in the state. Due to the geography of the mountainous landscape, the farms of the region are small, on average 75 acres and more than half operate on less than 50 acres. The mountain geography has prohibited the farms of the region from achieving the scale required to compete in high-volume, low-price global markets. The survival of the region's farms is also challenged by market dynamics and the uncertainties of historically important crops like tobacco and apples. Between 1949 and 2007, Western North Carolina lost over 70 percent of its farmland, and according to recent Agricultural Census data, about half the farms in the region are not profitable. Many farms have a historical reliance on products such as dairy and tobacco, which are increasingly no longer economically viable due to global market forces and/or a changing regulatory environment. To survive, farms in the region need higher-value markets.

In 2007, the Appalachian Sustainable Agriculture Project (ASAP) completed a multiyear research project that identified abundant local market opportunities for the region's farms (Kirby, Jackson and Perret, 2007). Eighty-two percent of consumers surveyed indicated that they would buy more locally-produced food if it were labeled as local. In addition to the significant gap between production and consumption, ASAP research has also shown that food grown locally was not consistently distinguished in the marketplace. To take advantage of this opportunity, ASAP developed the Appalachian Grown™ regional branding program to identify products from local farms and to protect the integrity of the local market. The program certifies food and agricultural products grown or raised on farms in Western North Carolina and the Southern Appalachian Mountains. The overall goal of the program is to expand the market for area farms and help shoppers easily identify farm products grown or raised on local farms in Western North

Carolina and the Southern Appalachians. The Appalachian Grown logo can be found on produce, packaging, at restaurants, grocery stores and other businesses and helps to inspire confidence that the produce or product been bought was grown close to home.

While not as important in direct markets where consumers are interacting with farmers directly, labeling and marketing local farm products is critical in larger-scale markets to both enable consumers to readily find locally-grown products and to help producers benefit from any premium associated with locally-grown food. Thus, the main objective of this study was to develop and test effective messaging and marketing efforts for the Appalachian Grown™ regional branding program.

This study is part of a project intended to enhance and expand economic opportunities for small and medium-sized farmers in Western North Carolina. The project integrated research and extension based activities to determine the types of messaging that impact consumer purchasing decisions and assess the best ways to assist retailers to implement in-store promotions and messages and engage retailers and buyers in the Appalachian Grown branding program.

**Literature Review**

Local food has become an important category in food marketing in recent times (Martinez et al., 2010; Giovannucci et al., 2010). According to a 2014 Survey of U S grocery shopper behaviors and attitudes, more than 25% of shoppers reported purchasing food that was locally grown up from 13% in 2007 (FMI, 2014). Verification of the growing interest in local foods is evident in the increased number of famers' markets and the value of direct sales from farmers to consumers through farmers' markets, roadside stands, pick-your-own operations, community supported agriculture (CSA) arrangements and other channels (USDA-NASS, 2012). In 2012, the number of farmers markets (7,864) in the USDA National Farmers Directory were reported to have

“more than quadrupled” in comparison to 1994 figures (USDA - AMS, 2015). A more recent USDA report reveals that 8, 268 farmers markets were operating in 2014 in the United States which represents a 180% increase from 2006 figures (Low et al., 2015). Local food is available to consumers through other marketing channels including supermarkets, specialty stores, restaurants, schools and hospitals (Hand, 2010).

Several studies suggest that consumers’ preference for buying local is primarily attributable to product freshness, quality and taste (Conner et al., 2009; Brown, 2003; and Jensen & Denver, 2014). For example, 86% of grocery shoppers interviewed in the 2014 Survey of Grocery Shopper Behaviors and Attitudes cited freshness as a topmost reason for buying local food and 61% cited taste as a third reason (FMI, 2014). There are also social, environmental and economic motivations for the preference for local foods (Day-Farnsworth et al., 2009). Socially, farmers’ markets are said to provide an avenue for exchange of information, entertainment and fun (Conner et al., 2009) and a means to connect producers with consumers who are desirous of a connection with the source of their food (Day-Farnsworth et al., 2009). Environmentally, supporters of local food claim that procuring local food reduces the distance food travels and as a consequence there is reduced wear on roads and green house gas emissions (Conner et al., 2009; Edwards-Jones et al., 2008). From an economic point of view, it is argued that when production, processing and distribution activities occur within a local area, employment, wages and income grow within that area (Hand, 2010).

Labeling and marketing of local products enable consumers to easily locate locally-grown products and help producers benefit from any premium associated with the product. Labels provide customers with information on the origin of the product. Labels could be state labels, regional labels, etc. State labels such as Arizona Grown, Maryland’s Best, Jersey Fresh,

Dakota Pride, etc. are state-wide branding efforts promoting local food produced within the state (Patterson, 2006). Regional labels promote local food grown within a region usually covering several counties or states. For example, Piedmont grown promotes local food produced in the 37 counties of the North Carolina Piedmont Region (Piedmont Grown, 2015). The Pride of the Prairie promotes local food grown in southwest and West Central Minnesota (Buy Fresh Buy Local - Pride of the Prairie, 2015). The Appalachian Grown program covers the region from Western Northern Carolina and the Southern Appalachians (Appalachian Grown, 2015). Finally, some stores use their own definition of local to label and market local food products. Walmart, considers local as proximity to a distribution center (USSAC, 2012) and Dorothy Lane Market considers local as within an hour's drive or at maximum leaving the farm by breakfast and getting to the market by lunch time (Dorothy Lane Market, 2015). Marketing these local foods most times include branding it with an identity and having preprinted stick-on-labels that make it easily recognizable.

Only a few studies have evaluated the impact of local food marketing and campaign efforts. Carpio and Isengildina Massa (2010) combine contingent valuation methods with a partial displacement equilibrium model to evaluate the local food campaign in South Carolina. The study reports a 3.4% increase in consumer willingness to pay as a result of the first season of the campaign efforts. The study also estimates a $3.09 million increase in producer surplus and a benefit-cost ratio of 6.18. Another study on the *Arizona Grown* campaign carried out in stores during the winter of 1999 provided little evidence of the program increasing product sales (Patterson et al., 1999). Govindasamy et al. (2003) estimate that the *Jersey Fresh* program provided about $32 in return for fruit and vegetable growers for every dollar invested in the campaign. An earlier study using in-store experiments by Brooker et al. (1987) evaluate the use

of the Tennessee Country Fresh campaign (TCF) labels on tomatoes. Statistical analysis of the sales data suggest that the TCF logo did not have a significant positive effect on the sales of local tomatoes. In terms of the methods used to evaluate local food marketing campaign efforts, the studies described previously used a variety of methods. Both the Tennessee and Arizona local food campaign evaluations used in-store type of experiments and measure the effect of the campaign on actual sales (Brooker et al. ,1987; Patterson et al., 1999). The study in New Jersey used state level time series data of agricultural receipts and expenditures in the campaign (Govindasamy et al., 2003). Finally, the South Carolina study used consumers' willingness to pay measures for locally grown products obtained for state wide surveys of consumers before and after the campaign efforts (Carpio and Isengildina-Massa, 2010).

Given the objectives of this study and data availability,[1] the evaluation of in-store local food promotion efforts is also done comparing willingness to pay measures before and after the marketing campaign efforts. However, in contrasts to all the previous studies that focused on state level programs, we focus on marketing efforts of a regional local foods effort: the Appalachian Grown program. Another contribution of the study is the evaluation of alternative promotional materials and messages that resonate with consumers and which is not available in the literature.

## Conceptual Framework

The model used here is based on the framework developed by Johnson and Myatt (2006), who theoretically examined the effects of advertising, product design, marketing and sales advice on the shape of consumer demand; thus, this framework allows to consider both a shift in the

[1] Use of actual sales data was not possible due to the fact that the Supermarkets involved in the project did not use different price look-up (PLU) codes for local and non-local foods.

demand curve as well as rotation of the demand curve as a result of marketing efforts. According to Johnson and Myatt (2006), advertisements consists of both "hype" and "real information" at varying levels. Hype promotes the existence of a product, emphasizes any valuable feature with the objective of increasing the willingness to pay of all consumers and it shifts the demand curve outward. Real information on the other hand allows consumers evaluate their personal match to a products' features. Real information disperses consumer valuations leading to rotations in the products' demand curve thus changing its shape.

In our application of Johnson and Myatt's (2006) framework, we evaluate the marketing impact of a regional branding program for local food and observe how this impacts both the mean value and the dispersion of consumers' willingness to pay. This approach is more general than the model utilized previously for the evaluation of local marketing efforts using consumers' willingness to pay measures which only focused on the change in the mean WTP value (Carpio and Isengildina-Massa, 2010).

## Empirical Analysis

We followed a four step approach in the design and testing of the marketing efforts in three grocery stores selected for the study: a) Pilot consumer surveys to design and evaluate messages and promotional materials to be used in the marketing campaign; b) Pre-intervention consumer surveys in the grocery stores; c) Implementation of the marketing campaign; d) Post-intervention consumer surveys in the grocery stores.

### *Pilot survey*

The pilot survey was conducted at six farmers' markets located in rural (2 markets) and urban (4 markets) areas of Western North Carolina during the fall 2012. The survey asked

respondents about their demographic information, their preference for local versus non-local food, consumer motivations for buying local foods, consumers' definitions of local foods, familiarity with ASAP's "Appalachian Grown" label, and preferences for messages for the marketing of local products. A total of 180 responses were received. The information obtained in the pilot survey was used for the development of the promotional strategies and materials used in the in-store promotion interventions.

*Pre and Post-Intervention Surveys*

In order to evaluate the effectiveness of the marketing interventions the same survey instrument was used before and after the marketing interventions at three grocery stores located in the region. A total of about 65-120 surveys were collected from each store/instance. In Stores 1 and 2 the pre-intervention surveys were conducted in the summer of 2013. The post – intervention surveys were conducted in the summer of 2014 in the case of Store 1, and in the fall of 2014 in the case of Store 2. The pre-intervention survey for Store 3 was conducted in the winter of 2014 and the post intervention survey in the fall of 2014.

The survey instruments included questions about consumers' motivations to select a specific store, their perceptions about the quality of the stores, general food purchasing habits as well as local food purchasing habits, Survey questions also included questions about customers' perceptions and definition of local foods, familiarity and use of local food labels including the Appalachian Grown logo. Demographic questions included questions about primary residence, income, size of the household, age, gender and education level of the respondent. Finally, since the analysis of the effect of the marketing campaign advertising requires us to estimate changes in consumers' WTP for local products, we use contingent valuation methods. Therefore, the survey included hypothetical questions about their WTP for local products. The WTP questions

used a dichotomous choice format, where a responder is asked to identify his/her choice to buy or not to buy a product at a stated price. In addition, the WTP questions were asked using premiums expressed in percentage terms (relative to the current price) rather than dollar values. Percentage premiums were used since we are trying to measure the average premium across the aggregate categories of produce and animal products. Individuals were initially asked if they would purchase a locally grown food product over a non-local version at a bid price that was more expensive than the non-local product. If respondents indicated a preference for the local produce at that bid price, they were subsequently asked if they would be willing to pay a premium that was 10% higher than the initial bid to purchase the local product. If consumers did not indicate a preference for the local product at the initial bid price, a follow-up question with a lower price bid (10% lower) was asked subsequently. The initial bids used were 10%, 20%, 30% and 40% premium on local food relative to non-local products. The corresponding follow-up bids were 20%, 30%, 40% and 50% when the initial response was "yes," and 0%, 10%, 20%, and 30% when the initial response was "no." The different bids used were chosen based on previous studies measuring WTP premiums for products in the region (Carpio and Isengildina-Massa, 2009; Carpio and Isengildina-Massa, 2010).

*Stores Selection and Marketing Campaign.*

After conversations with several stores in the region, only three stores located in three cities in Western North Carolina agreed to participate in the study. Marketing efforts were carried out in two stores and one store was used as a "control." Two of the stores (Stores 1 and 2) were located in relatively small towns (population between 2,600 and 8,000), and another (Store 3) was located in a bigger city (population of about 84,000). Although not all the marketing interventions were conducted simultaneously, there was significant overlap in the timing of

observation/intervention for the three stores. Moreover, the marketing interventions were carried out almost immediately after the pre-intervention surveys were conducted.

The marketing interventions/campaign involved the placement of the Appalachian Grown logo throughout the store (walls, along the aisles and hung from ceilings), along with signage that depicted information about specific local products when they became available at the stores including farm name, location, and a brief description and picture of the farm/farmers. It is important to note that before the marketing campaign the only signage advertising local products in all three stores were a few store-made signs.

*Econometric Model*

The econometric model was developed using consumers' responses to the survey WTP and socio-demographic characteristics questions. The four possible responses to the bid scenarios are: (1) "yes – yes", a yes to the first bid followed by a yes to the second (i.e., preference for local produce if it was 10% more expensive than the non-local product initially and then if it was 20% more expensive), (2) "yes – no" a yes to the first bid followed by a no (i.e., preference for local over non-local at 10% premium but no preference at the 20% premium, (3) "no-yes", a no to the first bid followed by a yes to the second (i.e., no preference for local over non-local at 10% premium but preference at 0% premium), (4) "no-no", a no to both first and second bids (i.e., no preference for local over non-local at 10%, followed by no preference at 0% preference). Denoting $PD_I$, $PD_H$ and $PD_L$ as the initial bid, the higher follow-up bid, and the lower follow-up bid, respectively, the following four discrete outcomes of the bidding process are observable:

(1) $$D = \begin{cases} WTP \geq PD_H & (response\ outcome\ 1), \\ PD_I \leq WTP < PD_H & (response\ outcome\ 2), \\ PD_L \leq WTP < PD_I & (response\ outcome\ 3), \\ WTP < PD_L & (response\ outcome\ 4), \end{cases}$$

The impact of explanatory variables on consumer *WTP* can be analyzed using the function:

(2) $$WTP = X\beta + \varepsilon\ ,$$

where $X$ is a vector of explanatory variables, $\beta$ is a conformable vector of coefficients, and $\varepsilon$ is a random variable accounting for unobservable characteristics. Using equation (1) and assuming that $\varepsilon \sim H(0, \sigma^2)$, where $H$ is a cumulative distribution function with mean zero and variance $\sigma^2$, we derive the choice probabilities corresponding to expression (1) as:

(3.1) $$P(WTP \geq PD_H) = 1 - H(PD_H - X\beta)$$

(3.2) $$P(PD_I \leq WTP < PD_H) = H(PD_H - X\beta) - H(PD_I - X\beta)$$

(3.3) $$P(PD_L \leq WTP < PD_I) = H(PD_I - X\beta) - H(PD_L - X\beta)$$

(3.4) $$P(WTP < PD_L) = H(PD_L - X\beta).$$

The log-likelihood function is:

(4)

$$L = \sum_{D_1} ln[1 - H(PD_H - X\beta)] + \sum_{D_2} \ln[H(PD_H - X\beta) - H(PD_I - X\beta)\ ] + \sum_{D_3} ln[H(PD_I - X\beta) - H(PD_L - X\beta)] + \sum_{D_4} \ln[H(PD_L - X\beta)\ ],$$

where $D_j$ indicate the group of individuals belonging to the $j^{th}$ bidding process outcome from the survey (equations 1). The approach outlined in equation (4) is an adaptation of the censored regression estimation procedure based on “closed-ended” contingent valuation survey data proposed by Cameron and James (1987) and Cameron (1988) to the case when survey participants respond in dichotomous fashion (yes/no) to the double-bidding process.

Estimation of the parameters in equation (4) requires assuming a specific distributional form for *H*. The assumed distributions used in this study was the normal distribution (Cameron, 1988). The vector of explanatory variables in (2) included a dummy variable that differentiates the pre and post intervention data (= 1 if post-intervention, 0 otherwise) and which is used to measure and test the impact of the marketing efforts. All other variables in the empirical model account for differences in consumers' *WTP* for the campaign due to demographic characteristics (Boyle, 2003). Finally, to explore the effect of the marketing efforts on the variability of the WTP function, the variance $\sigma^2$was also parametrized as a linear function of the post intervention dummy. Thus, the variance function included an intercept and the post intervention dummy. Maximization of the log-likelihood functions was performed using MATLAB.

## Results and Discussion

### *Pilot Survey*

Table 1 presents the demographic characteristics of the pilot consumer survey. Out of the 180 respondents interviewed, 72% were female. The majority of the respondents (92%) were Caucasians while other ethnicities made up the remaining 8%. Regarding household income and education, the sample included households from several income levels and education levels but mostly concentrated in the higher levels. The pilot survey results (Table 2) revealed that respondents prefer logos for local products that identify the local farm name and specific location of the farm. In addition, the majority of the respondents (56%) cited supporting the local economy and preserving the environment (44%) as the main reasons they would offer when trying to convince someone else to buy locally grown food. Quality and health reasons were

mentioned by 38% and 19% of respondents, respectively. Regarding familiarity with the Appalachian grown logo, respondents reported to be very familiar with it. More than half of the respondents (65%) reported seeing the logo and using it to find local products and 13% mentioned that they had seen it but paid no attention to it. When offered the option to select their top two convincing taglines related to local foods, the majority of the respondents (49%) chose "Certified local" as their first choice followed by "Thousands of miles fresher" which was preferred by 21% of respondents.

*Willingness to Pay*

Results of the WTP model assuming a normal distribution are reported in Tables 4 and 5. First, Table 4 reports the overall mean willingness to pay premiums for each store for the pooled pre and post intervention datasets. Results indicates that across the three stores, consumers are willing to pay a 48% premium on average for locally grown products. However, there is variability in the mean willingness to pay premiums values across stores which could be due to factors related to differences in the overall household composition of store customers, store type or location. Store 2 is the store with the highest WTP premium for local foods (54.4%) while Store 3 has the lowest (39.3%).

Table 5 presents the results of the regression model that includes factors affecting the WTP value. Parameter estimates in Table 5 can be interpreted as marginal effects in the linear regression model. For example, in Store 1 females are willing to pay 13.8% more for locally grown products than males. However, in Store 3, females are willing to pay 6.4% less for locally grown products. Overall, the results identify age, gender and the respondent being the primary shopper as the main factors affecting willingness to pay for locally grown products in Western North Carolina; however, the sign and magnitude of the effects is not consistent across regions.

Household income and location of primary residence was insignificant across the three stores. However, it is surprising that possessing a college education had a negative effect on WTP in the only instance where it was found to be significant (Store 2).

Regarding the effect of the marketing campaign on the willingness to pay for locally grown products, as expected, we did not find evidence of an effect of the campaign in the control store (Table 5). Moreover, we only find evidence of a statistically significant positive effect in one of the two stores where the campaign was implemented (Store 3). In the store where the campaign was found to have a positive impact, the campaign was found to increase consumers' willingness to pay for local grown products by about 4%. We also find evidence that in the Store 3 the marketing campaign increase the variance of the WTP distribution. Thus, we find evidence of both a "hype" and "real information" type of effects due to the marketing campaign.

**Summary and Conclusions**

The main objective of this study was to develop and test effective messaging and marketing efforts for the Appalachian Grown™ regional branding program. Specific objectives included: 1) the design and evaluation of messages and promotional materials marketing Appalachian Grown Products, and 2) the evaluation of the impact of an Appalachian Grown marketing campaign in grocery stores in Western North Carolina. The design and testing of the marketing efforts in three grocery stores selected for the study included the following activities: 1) A pilot consumer surveys to design and evaluate messages and promotional materials to be used in the marketing campaign, 2) Pre-intervention consumer surveys, 3) Implementation of the marketing campaign, and 4) Post-intervention consumer surveys. Surveys were collected between the summer of 2013 and fall 2014. The evaluation of the impact of the marketing efforts

utilized contingent valuation methods. Consumers' change in willingness to pay (WTP) for the Appalachian Grown attribute before and after the marketing campaign was used to evaluate the impacts of the marketing campaign.

Consumer surveys used to design the marketing campaign and messaging revealed that: a) Most consumers are familiar with the Appalachian Grown logo but not all use it to find local products; b) Fresh and local were most common assumptions made about the logo; and c) Farm name and location were selected as the preferred information when advertising local products.

On average, consumers are willing to pay a 48% premium for locally grown products in the three stores. However, there is some variability in the mean willingness to pay across stores. We found evidence of a statically significant positive effect of the marketing efforts in one of the two stores where the campaign was implemented (Store 3). In the store where the campaign was found to have a positive impact, the marketing campaign was found to increase consumers' willingness to pay for locally grown products by about 4%.

Our results indicate that consumers' willingness to pay may be positively impacted by the implementation of in-store local food marketing campaigns. We also identified criteria of trustworthiness, including information about farm name and location, which local food marketing campaigns should consider implementing in the future.

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**Table 1: Demographic Characteristics of Pilot Survey Respondents**

| Variable name | Category | Category Percentage |
|---|---|---|
| Gender | Male | 28.40 |
| | Female | 71.60 |
| Education | Less than HS graduate | 1.15 |
| | HS | 2.30 |
| | Some College | 13.22 |
| | 2-year degree | 5.75 |
| | 4-year degree | 36.78 |
| | Master's degree | 33.91 |
| | Professional degree or Doctorate | 6.90 |
| Ethnicity | African American | 1.72 |
| | American Indian/Alaskan Native | 0 |
| | Asian/Pacific Islander | 0.57 |
| | Caucasian | 91.95 |
| | Hispanic | 1.15 |
| | Middle Eastern | 0.57 |
| | Other | 4.02 |
| Total Household Income | Less than $20,000 | 13.25 |
| | $20,000 - $39,999 | 22.89 |
| | $40,000 - $59,999 | 22.29 |
| | $60,000 - $79,999 | 16.87 |
| | $80,000 - $99,999 | 13.25 |
| | $100,000 - $199,999 | 7.83 |
| | $200,000+ | 2.41 |
| | Not applicable (e.g. students living with other students | 1.20 |

**Table 2: Result of Pilot Survey for Evaluation of Messaging and Promotional Materials**

| Variable name | Category | Category Percentage | Mean (SD) |
|---|---|---|---|
| What makes a sign or logo identifying local foods trustworthy to you? (Scale 1 to 5: 1=not believable, 5= very believable) | Identifies farm name | | 4.30 (1.00) |
| | Picture or story about the farm or farmer | | 3.89 (1.24) |
| | Identifies the location | | 4.35 (0.94) |
| | Part of a state marketing program | | 3.63 (1.27) |
| | Labelled with grocery store own signage | | 2.54 (1.25) |
| If you were trying to convince someone else to buy local food, what reasons would you given them?[a] | Quality (e.g. fresher) | 7.56 | |
| | Quality, Economy (e.g. support farmers or businesses) and Environment (e.g. less use of gas) | 16.86 | |
| | Quality, Economy, Environment and Health | 5.23 | |
| | Quality, Economy and Health | 1.74 | |
| | Quality and Environment | 2.33 | |
| | Quality, Environment and Health | 0.58 | |
| | Quality and Health | 4.07 | |
| | Economy | 12.79 | |
| | Economy and Environment | 12.79 | |
| | Economy, Environment and Health | 4.07 | |
| | Economy and Health | 2.91 | |
| | Environment (e.g. less use of gas) | 2.33 | |
| | Other | 1.74 | |
| Familiarity with Appalachian Grown logo | I have never seen it | 21.97 | |
| | I have seen it but don't pay attention to it | 13.29 | |
| | I have seen it and use it to find local products | 64.74 | |
| | Certified local | 48.55 | |
| Which taglines would most convince you to purchase the products they label? | Thousands of miles fresher | 21.97 | |
| | Food from our farms | 12.14 | |
| | Fresh from here | 13.04 | |
| | From Appalachian Farms | 18.01 | |
| | Who grows your food | 13.66 | |

[a] This question was asked as an open ended question, the results reported provide a summary of the reasons provided.

**Table 3: Characteristics of Respondents to Pre and Post-Intervention Surveys**

| Variable name | Category | Store 1 (Control) | Store 2 | Store 3 |
|---|---|---|---|---|
| | | | Proportion | |
| Age | Under 20 | 2.14 | 1.72 | 0.40 |
| | 20-29 | 5.35 | 8.58 | 10.04 |
| | 30-39 | 11.23 | 12.02 | 17.67 |
| | 40-49 | 18.18 | 14.16 | 19.68 |
| | 50-59 | 32.09 | 19.74 | 20.08 |
| | 60-69 | 20.32 | 24.46 | 28.92 |
| | 70+ | 10.70 | 19.31 | 3.21 |
| Income | Less than $20,000 | 37.22 | 26.20 | 17.01 |
| | $20,000-$39,999 | 26.67 | 20.96 | 23.24 |
| | $40,000-$59,999 | 18.33 | 18.34 | 18.67 |
| | $60,000-$79,999 | 11.67 | 14.41 | 17.43 |
| | $80,000-$99,999 | 3.89 | 8.73 | 9.13 |
| | $100,000+ | 2.22 | 11.35 | 14.52 |
| Gender | Male | 35.94 | 34.76 | 40.16 |
| | Female | 64.06 | 65.24 | 59.84 |
| Education | Less than High School graduate | 7.65 | 5.91 | 0.00 |
| | High school | 26.53 | 16.03 | 2.00 |
| | Some college | 35.20 | 19.41 | 18.00 |
| | College graduate | 20.92 | 28.69 | 41.60 |
| | Graduate school | 9.69 | 29.96 | 38.40 |
| Number of members in the household | 1-4 | 82.66 | 91.02 | 96.35 |
| | More than 4 | 17.34 | 8.98 | 3.65 |
| Primary residence is Western North Carolina | Yes | 96.97 | 94.04 | 97.20 |
| | No | 3.03 | 5.96 | 2.80 |
| Primary shopper for the household | Yes | 85.49 | 87.71 | 80.08 |
| | No | 14.51 | 12.29 | 19.92 |
| Has heard of the Appalachian Sustainable Agricultural Project | Yes | 32.99 | 43.46 | 71.84 |
| | No | 67.01 | 56.54 | 28.16 |

**Table 4: Mean Willingness to Pay Premiums for Locally Grown Products in Western North Carolina**

| | Store 1 (Control) | Store 2 | Store 3 |
|---|---|---|---|
| **Mean** | 51.3 | 54.4 | 39.3 |
| **95% Confidence Interval** | [45.8, 56.9] | [47.1, 61.7] | [36.6, 42.0] |

**Table 5. Estimation Results of the Willingness to Pay Models for Locally Grown Produce**

| Variable | Store 1 (Control) | Store 2 | Store 3 |
|---|---|---|---|
| **Mean** | | **Parameters** | |
| Intercept | 0.183 | 0.218 | 0.247 |
| Post-intervention (Yes=1, No=0) | 0.066 | -0.161 | 0.041** |
| Age (Years) | 0.016 | 0.033*** | -0.004 |
| $Age^2$ | -0.020* | -0.037*** | 0.004 |
| Household income ($10,000/year) | -0.001 | 0.001 | 0.004 |
| College education (Yes=1, No=0) | 0.034 | -0.172** | 0.109 |
| Gender (0=Male, 1=Female) | 0.138** | 0.008 | -0.064*** |
| Size of household | 0.014 | 0.004 | 0.017** |
| Primary residence in Western North Carolina (Yes=1, No=0) | 0.058 | -0.051 | 0.058 |
| Primary shopper (Yes=1, No=0) | -0.006 | 0.160*** | 0.054** |
| **Standard Deviation (σ)** | | | |
| Intercept | -1.107*** | -1.134*** | -1.905*** |
| Post-intervention (Yes=1, No=0) | -0.633** | -0.535* | |
| Log-likelihood | -118.17 | -129.38 | -292.96 |
| Sample size | 131 | 171 | 254 |

One asterisk (*) indicates significance at the 10% level, two asterisks (**) indicate significance at the 5% level, and three asterisks (***) indicate significance at the 1% level.