An Examination of Consumer Willingness to Pay for Local Products

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June 3, 2013

Selected Paper prepared for presentation at the Agricultural & Applied Economics Association's 2013 AAEA & CAES Joint Annual Meeting, Washington, DC, August 4-6, 2013

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Abstract. This paper uses stated and revealed preference data from a choice-based conjoint survey instrument to estimate willingness to pay for distance-based local food products. The survey was administered to three different groups of respondents: members of a consumer buying club, a random sample of Maryland residents, and suburban Maryland grocery store shoppers. We find that both the random sample of Maryland residents and the grocery store shoppers are willing to pay a premium for local products, but view locality and production method as substitutes. Conversely, more selective shoppers, members of a consumer buying club, are willing to pay less for local than their counterparts, but do not conflate local with other premium attributes, such as grass-fed production.

Keywords. conjoint analysis, field experiment, local, grass-fed, willingness to pay, beef

Recent years have seen resurgence in the marketing and consumption of local food products (USDA NASS 2009; USDA AMS 2009; Brown and Miller 2008). However, the precise definition and concept of local remains nebulous and consumers are left to project their own perceived attributes onto local products, often projecting positive attributes. In a recent publication, the United States Department of Agriculture [USDA] suggested that consumers choosing local food products are doing so because of perceived freshness, health benefits, environmental sustainability, and support for small farms and the local economy (Martinez et al. 2010). Given the recent increase in focus (USDA's Know Your Farmer Know Your Food campaign, farm-to-school programs, etc.) and apparent popularity and marketing surrounding local (Jersey Fresh, Maryland's Best, Pride of New York, California Grown, etc.), we undertook this study to quantify the premium on local products and to determine who is willing to pay for these products.

In order to best examine consumer preferences for the local attribute, we chose ground beef as our product of analysis because beef, unlike produce, conveys no obvious notion of "freshness" with distance traveled, and therefore distance conveys more signal and less noise in the measurement of preferences (Dentoni et al. 2009). A second advantage of ground beef is the limited spectrum of attributes that can vary, notably the leanness and the production method. We

focus solely on lean beef, defined as 90 percent lean, and use grass-fed beef production to address variation in production method. Grass-fed operations by definition have non-confined cattle, relatively high land demands per head, and are generally viewed positively in the sense that grass requires less input than grain to grow. Given the fact that consumers often project positive personal beliefs onto the local attribute of a product, we have attempted to use the grass-fed attribute to capture these positive associations, directly isolating the distance component of the local attribute. Additionally, because of the nature of the local label, we narrowed the definition by only referring to distance from producer to consumer.[1] All things held equal with regards to production method, if consumers value distance one might assume this is to contribute their food dollars to the local economy.

To estimate willingness to pay for ground beef, we collected preference data from a choice-based conjoint analysis survey from multiple populations, including more selective shoppers and the general population. To our knowledge, this study is the first to examine the extent to which information or experience of the food shopper impacts the willingness to pay for distance-based local products. We also examine the relationship between local products and the general population under both stated and revealed preference studies. We find that more selective food shoppers value the distance-based attribute much less than the general public, though both are significantly different from zero, and that the general public is willing to pay a premium for local products in both the stated and revealed preference applications. Also, contrary to common perceptions, we find this premium for local products exists across income levels and ages.

Lastly, we address possible substitution and complementarity between the production method and location attributes in our study (Onozaka and Thilmany McFadden 2011). It is

[1] In our surveys, we never refer to a product as local, instead we provide participants with information about the miles the product traveled.

plausible that the distance and grass-fed attributes may have overlapping values for consumers. This is especially likely in the circumstance where consumers are projecting personal positive notions of local which are embodied in grass-fed production explicitly. For example, because consumers may already associate local production with more "friendly" farming methods, it is likely that the grass-fed attribute may contribute little additional value to a locally-produced product. In this case grass-fed and local production are substitutes. On the other hand, local production may provide value independent of (or even enhance) the grass-fed attribute for consumers with a different set of beliefs.

Methods for Eliciting Willingness to Pay

In the last decade, a large literature has developed that aims to estimate consumers' willingness to pay [WTP] for various quality attributes. Most studies tend to use one of three basic methods to elicit WTP: choice-based conjoint analysis [CA], experimental auctions, or hedonic models. CA is widely used in consumer marketing (Green and Srinivasan 1990) and has also become a common tool used by environmental economists to evaluate nonmarket goods. This method typically uses a survey instrument, and the WTP measure is elicited from a hypothetical market scenario. The values elicited using stated preference data do not reflect actual market transactions and have thus been met with some skepticism among economists (Cummings, Brookshire, and Schulze 1986; Mitchell and Carson 1989; Adamowicz, Louviere, and Williams 1994; and many others).

To address this concern, researchers have devised incentive compatible field experiments with real money (List and Gallet 2001; Harrison and List 2004). In these cases, the method for eliciting WTP may involve an non-hypothetical CA or some type of experimental auction. Lastly, the use of hedonic models with revealed preference data (such as consumer scanner data)

offers an alternative to real experiments, but this method provides much less control, and the analysis is limited to existing products with available data.

Studies of WTP for Food Attributes

Food products are increasingly differentiated by quality attributes, some of which include environmental considerations, production methods, seed genetics, farm location, and other health-related factors. A considerable literature attempts to estimate consumers' WTP for food that contains genetically modified organisms [GMO]. In fact, Lusk, et al. (2005) identifies 25 separate studies that together provide 57 estimates of consumers' WTP for food containing GMOs.

For the present product under consideration, grass-fed production is a process trait that may encompass several quality attributes of ground beef. For example, grass-fed cattle are commonly associated with leaner beef (a taste/health quality), but also involve a different production method (pasturing) that may be inherently valuable to consumers. Lusk and Parker (2009) employ a CA design and find positive WTPs for beef with improved fat content, which is consistent with prior hedonic demand analysis of ground beef (Brester et al. 1993; Parcell and Schroeder 2007; Ward, Lusk, and Dutton 2008). Positive WTPs for grass-fed production distinct from fat content have also been measured using hypothetical CA (Abidoye et al. 2011), incentivized CA (Lusk, Fields, and Prevatt 2008), and experimental auctions (Umberger et al. 2002; Umberger, Boxall, and Lacy 2009). Recognizing the importance of leanness in the ground beef market, we control for this confounding effect by holding leanness constant across all of our choice sets.[2]

[2] Given the consumer backlash to the knowledge of lean finely texture beef [LFTB], a.k.a. "pink slime", that occurred during our study period our choice of 90/10 beef was fortuitous because both grass-fed and conventional beef can attain this level of leanness without using this additive. All beef in our study was free of LFTB.

Much of the literature on WTP for local production is based on hypothetical surveys, but we observe the same trend that consumers have a positive WTP for local food (Loureiro and Hine 2002; Brown 2003). Similar to grass-fed, local production may also span several quality attributes including product freshness, farm size, and actual production location. Darby, et al. (2008) estimates WTP for strawberries differentiated by production location, farm size, and freshness guarantee and finds that consumers' have a positive WTP for local production distinct from other attributes. An important consideration with regard to this product choice is the implied freshness attached to fruit and vegetables that were harvested nearby and thus more likely to have been harvested more recently. Ground beef avoids this critique.

Sampling and Data Collection

Our data are derived from three primary sources as follows:

(1) a survey of participants in a food buying club based in Maryland generating hypothetical conjoint responses (conducted fall of 2011);
(2) a survey of the general population of Maryland generating hypothetical conjoint responses (conducted fall of 2011);
(3) a field experiment in a suburban Maryland grocery store generating non-hypothetical conjoint responses (conducted fall of 2012).

The food buying club represents a set of shoppers with experience purchasing local and grass-fed food products, primarily meat, eggs, and dairy. The club has been in operation since 2004 and has delivery locations across the state of Maryland and expands to new members by word of mouth. Products are ordered via the internet and the orders are fulfilled by one of a handful of farmers in Maryland and southeastern Pennsylvania on a weekly basis. Members of the buying

club were approached for participation via email solicitation using the Listserv of the entire buying club which contained approximately 1,200 email addresses. The buying club is an important choice based sample because this group has self-selected themselves as focused on local food and have an expressed interest in grass-fed livestock.

The second sample is comprised of a random selection of Maryland residents over the age of 25 recruited by a web survey company. This sample was targeted to represent a baseline comparison population for the buying club sample. We administered the same survey instrument and conjoint analysis questions to this sample in the same time period as the buying club sample. The third sample is comprised of shoppers of a midsized, regional grocery chain in a Baltimore suburb. These shoppers were recruited over a weekend in fall of 2012. This sample received a shortened version of the survey instrument and a non-hypothetical version of the conjoint choice questions where they received actual ground beef and a coupon off their grocery bill based on their own choices.

Survey and Conjoint Choice Analysis

On-line survey questionnaires were administered to the first two groups of respondents. Upon consenting to participate, respondents completed a brief survey of food purchase behavior, followed by a series of four hypothetical ground beef choice experiments, and finally some demographic and socioeconomic questions. In total, 358 buying club members and 327 random Maryland residents completed the survey. Descriptive statistics for the two samples are reported in Table 1. As previously stated, the survey contains four ground beef conjoint choice questions. The instructions for the conjoint choice questions ask the respondent to choose between two hypothetical one-pound packages of ground beef that are identical in every way except for the attributes described. That is, two product profiles are presented side-by-side (Figure 1) and

information is provided on five different attributes: producer (farmer you know, farmer you do not know); distance traveled (100 miles, 400 miles, 1000 or more miles); use of antibiotics and hormones (USDA certified organic; not organic, but no use of antibiotics or hormones; not organic and use of antibiotics and/or hormones); livestock production (pastured zero to three months of the year, pastured three to six months of the year, pastured six or more months); and price ($4.00, $6.00, $8.00). All attribute levels are fully listed in Table 2. Respondents were then asked to state which of the two product profiles they would choose, Beef A or Beef B, or if they would not choose either option (Beef C).

To generate the experimental design, SAS software was used to create the different product profiles. A total of 162 product profiles (2 producer levels × 3 distance traveled levels × 3 antibiotic/hormone levels × 3 livestock production levels × 3 price levels) were generated. Four blocks with twenty paired product profile comparisons were then created using D-Optimal criteria with one restriction imposed: if the producer is not known, the price of organic ground beef must always exceed the price of ground beef produced with the use of antibiotics and/or hormones. This restriction was imposed to mimic prices normally observed in retail outlets. Each respondent was randomly assigned to one question from each block of the experimental design, with each respondent completing a total of four hypothetical choice experiments.

We use a random utility model to determine the WTP for the grass-fed and local attributes in one pound of ground beef. When an individual *i* chooses between *J* choices, suppose the utility of the choice *j* is

$$U_{ij} = \boldsymbol{x}_{ij}'\boldsymbol{\beta} + \varepsilon_{ij},$$

where $\boldsymbol{x}_{ij}$ is a vector of choice-specific attributes and ε_{ij} is a stochastic component of utility. The vector of coefficients $\boldsymbol{\beta}$ represents the change in utility associated with a unit change in a given attribute. If we observe that an individual chooses alternative j, we assume that

$$U_{ij} \geq U_{ik} \quad \text{for all } k \neq j, k \in J.$$

Let Y_i be a random variable indicating the alternative individual i chooses. If the J error terms for each individual are *iid* with Type 1 EV distribution, we can express the probability that choice j is made as

$$\begin{aligned} \text{Prob}(Y_i = j) &= \text{Prob}(U_{ij} \geq U_{ik}) \\ &= \frac{\exp(\boldsymbol{x}_{ij}'\boldsymbol{\beta})}{\sum_{j=1}^{J} \exp(\boldsymbol{x}_{ij}'\boldsymbol{\beta})}, \end{aligned}$$

which provides the basis for the conditional logit model (McFadden 1974; Louviere, Hensher, and Swait 2000). Each of our empirical specifications includes a cost attribute, and its coefficient β^{cost} is interpreted as the marginal utility of income. We calculate the WTP for a particular attribute as the compensating variation for a change in that attribute, which is simply the ratio $\beta^{\text{att}}/\beta^{\text{cost}}$ where β^{att} is the attribute coefficient.

Hypothetical Sample Results

The hypothetical sample participants differ on several demographic margins as shown in Table 1. The buying club sample is overwhelmingly female, younger, and slightly more educated; but there is no difference in income, household size, or households with children. We collect some background information about the knowledge and participation in a likely local food marketplace, a farmer's market, and see that 84.7 percent of the buying club members visit such markets an average of 21 times per year, while the numbers form the general population sample

are 67.3 percent and 13, respectively.[3] We also ask the participants an open-ended question which states: "Within how many miles of where you live would meat, poultry, and dairy products need to be raised to be considered local?". The median and mean responses from the buying club are 100 and 113 miles respectively, while the median and mean from the general population are 40 and 47 miles, respectively. See Figure 2 for the distribution of these responses. It is clear that the buying club responses are more realistic for the major metropolitan areas, like Washington, D.C., where sourcing food from within 40 miles would be very difficult. The average length of time participants have been members of the club is 2.83 years. In short, the experience and depth of exposure to the local attribute are obvious from the survey responses, but we are equally interested in how these groups are willing to trade off cost for these attributes.

We use a standard conditional logit model to analyze the hypothetical survey data and calculate marginal WTP estimates for the consumer buying club sample, the random sample of Maryland residents, and the pooled sample. Model estimates are presented in Table 3. The baseline product for comparison is one pound of ground beef, raised by an unknown farmer 1000 miles away, with the use of antibiotics and hormones, and pastured zero to three months. For the buying club sample, we estimate a WTP for beef raised within 100 miles of $1.21, which is less than half the estimate for the general population sample of $2.71. Interestingly, the buying club does not have a significant WTP for beef raised 400 miles away, while the other sample exhibits a large WTP estimate of $2.39. We view this as further confirmation that the buying club has well-formed views on the meaning of local and value of distance as an attribute. On the other hand, the buying club members are willing to pay $2.65 for beef pastured six or more months, nearly twice that of the general population sample at $1.63.

[3] A *t*-test of a difference of the means confirms these differences are statistically significant.

While these results are revealing with regard to direct effects, we wish to unpack the relationship between the attributes from the responses. Do these attributes act as substitutes or complements? To address this question we estimated significant interactions between the attributes pastured six or more months and raised 100 miles away, as presented in Table 4.[4] In the case of the general population sample, we estimate a WTP for the interaction of -$2.46. This effectively mitigates the value of one of the attributes, implying that they are substitutable to these consumers. Intuitively, this is evidence that consumers view local production and grass-fed production methods as having overlapping benefits (e.g. perhaps some notion of sustainability) and therefore do not view the attributes independent of one another. The interesting comparison is, of course, with the buying club. The buying club exhibited markedly different behavior with a positive WTP estimate for the interaction of $1.28. For these consumers, the two attributes are complementary which reinforces the notion that these selective shoppers are valuing the attributes and not their perception of the attribute.

To better understand the differences in WTP across samples, we compared the WTP estimates with the consumers' self-reported importance of each attribute from a follow-up question on the survey where we asked respondents to rank how important each attribute was in their decision. The first 6 rows of data in Table 5 display the percentage of "very important", "important", and "not important" responses by sample. It is clear the buying club sample focused heavily on the grass-fed attribute where 86 percent define it as very important. A significant majority, 66 percent, consider the distance to the producer to be important, as well. The general population sample was less conclusive on which attributes influenced their choices with only

[4] Given the different compositions of the samples, we also explored interactions between attributes and other key demographic variables including gender, income, college education, age, household size, and white. These interaction results produce no obvious departures from the direct results and are available upon request from the authors.

price garnering a 50 percent share in the "important" category. This begs the question of whether the hypothetical results for the Maryland sample are reflecting true values and provides the motivation for our subsequent non-hypothetical in-store experiment.

In-Store Experiment

Having estimated significant WTP values for both grass-fed and local beef products from two hypothetical surveys, we sought to validate our results in the field where the experimental subjects are making tradeoffs between money and quality attributes of ground beef products. While we have no *a priori* reason to suspect bias from our survey samples, especially the buying club group, we wish to validate these stated preference results with a comparable set of revealed preference data. Our research design is rooted from the criticisms of stated preference elicitation mechanisms (Cummings, Brookshire, and Schulze 1986; Mitchell and Carson 1989; Adamowicz, Louviere, and Williams 1994) and their comparisons to revealed preferences mechanisms (Carson et al. 1996).

Unlike the studies analyzed by Carson et al. (1996), our collection of the revealed preference data utilizes an in-store experiment and resembles the work of Loureiro, McCluskey, and Mittelhammer (2003) and Lusk, Norwood, and Pruitt (2006). There is a rather exhaustive literature regarding field experiments in comparison to lab experiments, but less focus has been given to comparing conjoint choice analysis to a field counterpart.[5] We have the unique opportunity of access to our population of interest, as well as access to the product we wish to study (locally-produced, grass-fed beef), and have a simple decision structure to allow implementation in a field setting. Using the terminology popularized by Harrison and List

[5] This is most likely due to the types of issues studied by conjoint analysis, some involving exogenous non-market attributes that by nature must be hypothetical.

(2004), our experiment is best viewed as a framed field experiment with the "field" context being implemented in commodity, information set, and task. We differ from a pure natural field experiment only in the fact that our subjects are aware of their participation. Further, the experiment's mechanism could be classified, simply, as a non-hypothetical choice based conjoint analysis because even though we control the product attributes, we must value them in randomly generated combinations as they are too numerous for individual treatment isolation.

Design and Implementation

Our approach involves intercepting grocery store shoppers and presenting them with a rather simple choice involving a product with high familiarity (a pound of ground beef) and money. Not only do we implement the experiment in the grocery store, but we also locate the experiment in the meat section of the store in an attempt to limit our sample to shoppers entering the meat department, thus minimizing non-meat buying consumers in the sample. Finally, unlike Lusk, Norwood, and Pruitt (2006), we do not alter the information set of the consumers using any form of cheap-talk (Cummings and Taylor 1999; Lusk 2003); our participants have their own randomly assigned information sets given to them outside the experiment.

Despite the fact that our survey results suggest little correlation between the grass-fed and local attributes of beef and socioeconomic characteristics of our participants, we intentionally conducted our non-hypothetical, in-store experiment in a conventional grocery store and not a specialty or natural foods store. Were conventional wisdom to hold true, our store selection would *a priori* bias any WTP measures toward zero. For example, the store in which we conducted the experiment had little penetration of organic or local products and carried no grass-fed or local beef products in the meat department. Based on discussions regarding sampling and customer demographics with store management, we conducted the experiment over the course of

10 hours on a non-holiday, non-first or last weekend of the month in the fall of 2012. This choice of day avoids any bias due to atypical holiday-only grocery shoppers or due to the impact of once-monthly (fixed income) shoppers.

The day before the experiment, we had over 300 pounds of grass-fed locally-produced ground beef delivered to the store in approximately one pound packages, and the morning of the experiment the store butcher produced one pound packages of conventionally-raised ground beef. All beef was 90% lean ground beef to minimize any selection based on leanness. We then labeled the ground beef with one of two labels: grass-fed, raised within 100 miles, or both; and the consumer received the appropriately labeled package depending on the choice made. Participants were not shown the beef packages prior to completing the choice experiments in order to eliminate any visual bias. The choice presented to the consumer is illustrated in Figure 3. This figure illustrates a selection between grass-fed and local versus simply grass-fed. See Table 6 for a full listing of the attributes. Similar to the experimental design used in the hypothetical conjoint analysis, D-Optimal criteria were again used to generate the different non-hypothetical product profile pairs. The Gift C or "No Beef" coupon value is always 25 cents more than the largest coupon value offered between ground beef choices, Gift A and Gift B, to ensure that participants only choose ground beef because they desire ground beef. In other words, any participant seeking the largest coupon amount will migrate to Gift C. The coupon amounts for Gift A and Gift B varied randomly across values from the set {$0.50, $2.50, $4.50} with only one price restriction imposed so as to mimic prices normally observed in retail outlets. That is, grass-fed and local ground beef options are always more expensive than the conventional, domestic ground beef option.

The experiments were completed via the internet using tablet computers. The typical interaction is as follows:

1. Shopper passes near the meat department of the supermarket.
2. An enumerator asks the participant if they would like to participate in a brief survey and a short experiment in order to receive a coupon and/or a pound of ground beef. The coupon is good the day of the experiment and is subtracted from the total grocery bill.
3. If the shopper agrees, the enumerator leaves them with a tablet computer and simply asks them to follow the on-screen instructions.[6]
4. The shopper answers a few background demographic questions and is then presented with two choice questions in the format of Figure 3. One of the questions has an image of a Heads coin in the top margin and the other has a Tails coin.
5. When finished, the shopper flips a coin and that choice is fulfilled.

The complete interaction took between 5 and 10 minutes. We had a total of 279 participants generating 558 observations for the analysis, and no one dropped out after starting the experiment. Table 7 compares the distribution of attributes for the choices presented versus the actual choices made by participants. The sample statistics for the socioeconomic and demographic data are given in Table 8. It is important to note that this sample is slightly older, less educated, and has smaller households than either of our survey samples.

Non-Hypothetical Sample Results

We apply the same econometric model presented in the previous section, the conditional logit, and produce estimates for the "willingness to pay" for attributes of ground beef exactly as

[6] In the case the shopper was uncomfortable with the tablet's interface, the enumerator simply administered the survey and experiment after informed consent was granted.

presented in the hypothetical survey discussion.[7] Results from the conditional logit are given in Table 9. The calculated WTP values are $0.82 and $1.47 for the grass-fed and local attributes, respectively. These are less than either of the hypothetical survey WTP values, but are similar in pattern to the survey of the general public, with the local attribute being valued almost twice as much as the grass-fed attribute. The non-hypothetical results suggest the WTP for each attribute is approximately half what the non-hypothetical values suggest. Table 10 further breaks down these results using interactions with income and age, and again we see no clear pattern of statistical significance with these interactions, though we see in this sample that the older the participant, the less favorable they viewed the local attribute.

Conclusion

Locally produced food products are a popular and growing segment of our food choices, as well as a focus of food policy at federal and state levels. Local, as an attribute, is still poorly defined and perhaps even more poorly understood. We have focused this study on isolating one attribute most often associated with "localness", the distance between producer and consumer. Using a unique choice-based sub-sample of local food shoppers, we compare the willingness to pay and the attribute relationship between local and grass-fed ground beef to both hypothetical and non-hypothetical samples of Maryland residents. We find that the more selective food shoppers value the local attribute less than their counterparts, but the local attribute is not being conflated with other premium attributes. The hypothetical and non-hypothetical samples of Maryland residents also are willing to pay a premium for local, but view local and grass-fed as substitutes, seemingly attributing the premium qualities of the grass-fed operations to the local attribute and potentially

[7] WTP is not quite correct because participants never paid any money. However, for presentation consistency we use WTP because there should be no distinction between WTP and willingness to accept as the endowment point is neutral.

over paying for this attribute in isolation. Our results suggest that the local label may require more structure and would potentially benefit all parties involved. From the perspective of a local producer, this structure will help protect the brand and maintain the premium for local products; and from the perspective of the consumer, clearer labeling would prevent expenditures to attain local attributes that are not related to “more desirable” production methods.

References

Abidoye, B.O., H. Bulut, J.D. Lawrence, B. Mennecke, and A.M. Townsend. 2011. "U.S. Consumers' Valuation of Quality Attributes in Beef Products." *Journal of Agricultural and Applied Economics*. 43(1):1-12.

Adamowicz, W.L., J. Louviere, and M. Williams. 1994. "Combining Revealed and Stated Preference Methods for Valuing Environmental Amenities." *Journal of Environmental Economics and Management* 26(3): 271-292.

Brester, G.W., P. Lhermite, B.K. Goodwin, and M.C. Hunt. 1993. "Quantifying the Effects of New Product Development: The Case of Low-Fat Ground Beef." *Journal of Agricultural and Resource Economics* 18(2):239-50.

Brown, C. 2003. "Consumers' Preferences for Locally Produced Food: A Study in Southeast Missouri." *American Journal of Alternative Agriculture* 18(4):213–24.

Brown, C., and S. Miller. 2008. "The Impacts of Local Markets: A Review of Research on Farmers Markets and Community Supported Agriculture (CSA)." *American Journal of Agricultural Economics* 90(5):1296–1302.

Carson, R.T., N.E. Flores, K.M. Martin, and J.L. Wright. 1996. "Contingent Valuation and Revealed Preferences Methodologies: Comparing the Estimates for Quasi-Public Goods." *Land Economics* 72(1):80-99.

Cummings, R.G., D.S. Brookshire, and W.D. Schulze, eds. 1986. *Valuing Environmental Goods: A State of the Arts Assessment of the Contingent Method.* Totowa, NJ: Rowman and Allanheld.

Cummings, R.G., and L.O. Taylor. 1999. "Unbiased Value Estimates for Environmental Goods: A Cheap Talk Design for the Contingent Valuation Method." *American Economic Rview* 89(3):649-665.

Darby, K., M.T. Batte, S. Ernst, and B. Roe. 2008. "Decomposing Local: A Conjoint Analysis of Locally Produced Foods." *American Journal of Agricultural Economics* 90(2):476-486.

Dentoni, D., G.T. Tonsor, R.J. Calantone, and H.C. Peterson. 2009. "The Direct and Indirect Efffects of 'Locally Grown' on Consumers' Attitudes towards Agri-Food Products. *Agricultural and Resource Economics Review* 38(3):384-396.

Green, P.E., and V. Srinivasan. 1990. "Conjoint Analysis in Marketing: New Developments with Implications for Research and Practice." *Journal of Marketing* 54(4):3–19.

Harrison, G.W., and J.A. List. 2004. "Field Experiments." *Journal of Economics Literature* 42(4):1009–1055.

List, J.A., and C. Gallet. 2001. "What Experimental Protocol Influence Disparities between Actual and Hypothetical Stated Values? Evidence from a Meta-Analysis." *Environmental and Resource Economics* 20(3):241–254.

Loureiro, M. L., and S.E. Hine. 2002. "Discovering Niche Markets: A Comparison of Consumer Willingness to Pay for Local (Colorado Grown), Organic, and GMO–Free Products." *Journal of Agricultural and Applied Economics* 34(3):477–487.

Loureiro, M.L., J.J. McCluskey, and R.C. Mittelhammer. 2003. "Are Stated Preferences Good Predictors of Market Behavior?" *Land Economics* 79(1): 44-55.

Louviere, J.J., D.A. Hensher, and J.D. Swait. 2000. *Stated Choice Methods: Analysis and Application*. Cambridge: Cambridge University Press.

Lusk, J. L. 2003. "Effects of cheap talk on consumer willingness-to-pay for golden rice." *American Journal of Agricultural Economics* 85(4): 840-856.Lusk, J. L., D. Fields, and W. Prevatt. 2008. "An Incentive Compatible Conjoint Ranking Mechanism." *American Journal of Agricultural Economics* 90(2):487-498.

Lusk, J. L., M. Jamal, L. Kurlander, M. Roucan, and L. Taulman. 2005. "A Meta-Analysis of Genetically Modified Food Valuation Studies." *Journal of Agricultural and Resource Economics* 30(1):28–44.

Lusk, J. L., F.B. Norwood, and J.R. Pruitt. 2006. "Consumer Demand for a Ban on Antibiotic Drug Use in Pork Production." *American Journal of Agricultural Economics* 88(4):1015-1033.

Lusk, J.L., and N. Parker. 2009. "Consumer Preferences for Amount and Type of Fat in Ground Beef." *Journal of Agricultural and Applied Economics* 41(1):75-90.

Lusk, J L., I.J. Roosen and J.A. Fox. 2003. "Demand for Beef from Cattle Administered Growth Hormones of Fed Genetically Modified Corn: A Comparison of Consumers in France, Germany, the United Kingdom, and the United States." *American Journal of Agricultural Economics* 85(1):16-29.

Martinez, S., M. Hand, M. Da Pra, S. Pollack, K. Ralston, T. Smith, S. Vogel, S. Clark, L. Lohr, S. Low, and C. Newman. 2010. *Local Food Systems: Concepts, Impacts, and Issues.* United States Department of Agriculture, Economic Research Service, Economic Research Report No. 97.

McFadden, D. 1974. "Conditional Logit Analysis of Qualitative Choice Behavior." In P. Zarembka, ed., *Frontiers in Econometrics*. New York: Academic Press.

Mitchell, R.C., and R.T. Carson. 1989. *Using Surveys to Value Public Goods: The Contingent Valuation Method*. Baltimore: Johns Hopkins University Press for Resources for the Future.

Onozaka, Y., and D. Thilmany McFadden. 2011. "Does Local Labeling Complement or Compete with Other Sustainable Labels? A Conjoint Analysis of Direct and Joint Values for Fresh Produce Claims." *American Journal of Agricultural Economics* 93(3):693–706.

Parcell, J.L., and T.C. Schroeder. 2007. "Hedonic Retail Beef and Pork Prices." *Journal of Agriculture and Applied Economics* 39(1):29-46.

Umberger, W.J., P.C. Boxall, and R.C. Lacy. 2009. "Role of credence and health information in determining US consumers' willingness to pay for grass-finished beef." *Australian Journal of Agricultural and Resource Economics* 53(4):603-623.

Umberger, W.J., D.M. Feuz, C.R. Calkins, and K. Killinger-Mann. 2002. "U.S. Consumer Preference and Willingness-to-Pay for Domestic Corn-Fed Beef Versus International Grass-Fed Beef Measured Through an Experimental Auction." *Agribusiness* 18(4):491-504.

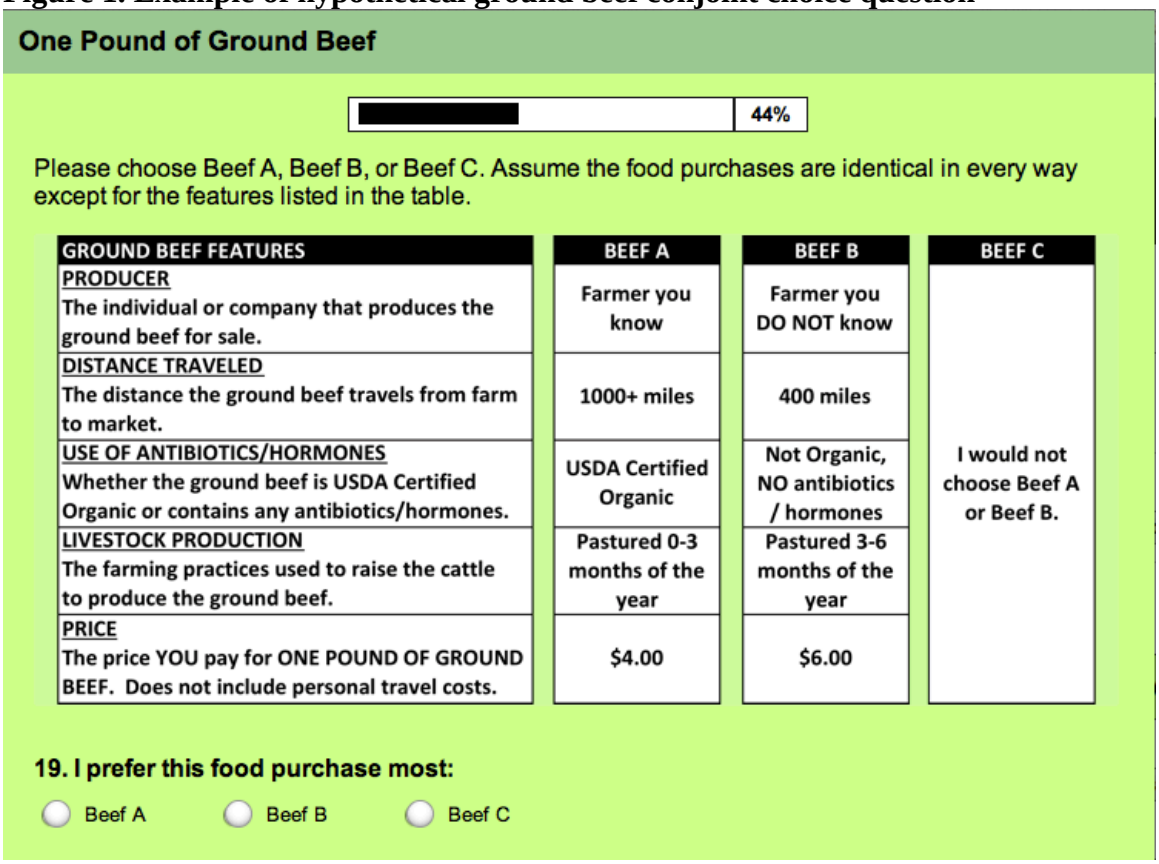
United States Department of Agriculture, National Agricultural Statistics Service. 2009. *2007 Census of Agriculture: Organic Production Survey (2008)*.

United States Department of Agriculture, Agricultural Marketing Service. 2009. *Farmers' Market Growth: 1994-2009*.

Ward, C.E., J.L. Lusk, and J.M. Dutton. 2008. "Implicit Value of Retail Beef Product Attributes." *Journal of Agricultural and Resource Economics* 33(3):364-381.

Figures

Figure 1. Example of hypothetical ground beef conjoint choice question



Note: All attributes and attribute levels are fully listed in table 2.

Figure 2. How do respondents define local?

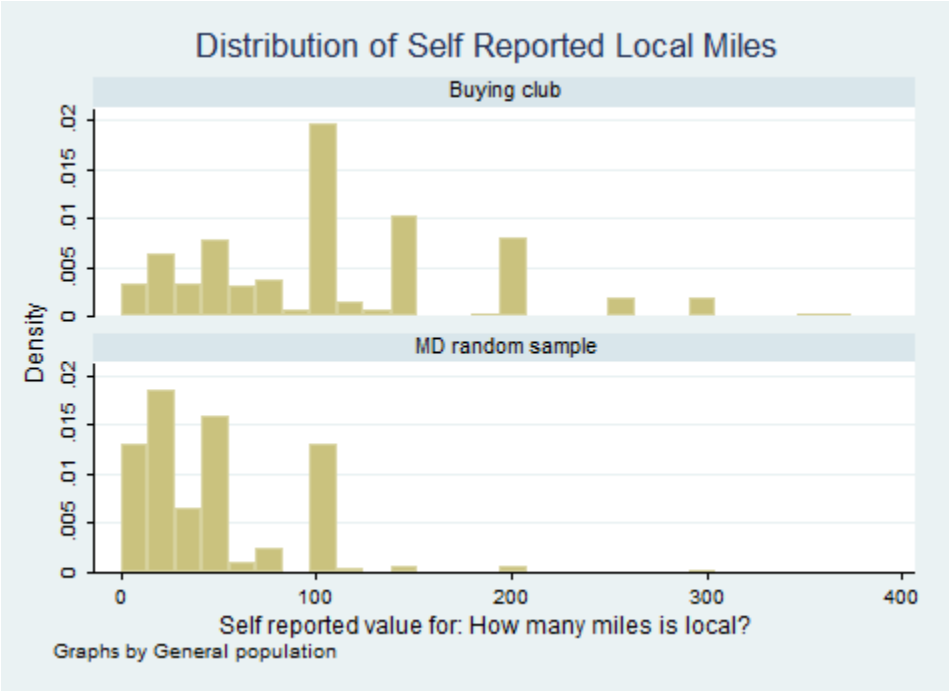
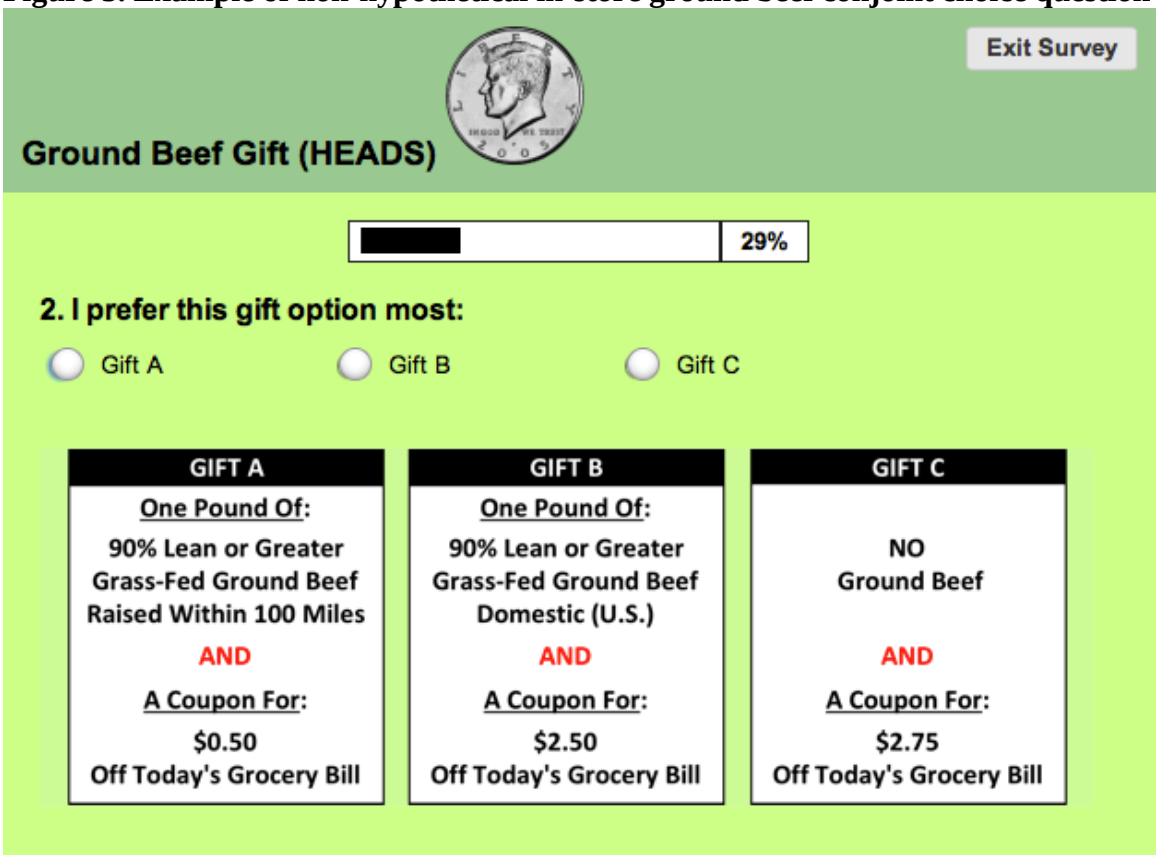


Figure 3. Example of non-hypothetical in-store ground beef conjoint choice question



Tables

Table 1. Demographic Characteristics of Buying Club and Random Samples

	State[†]	Buying Club	Random Sample
Number of Respondents	–	358	327
Median Household Income	$70,004[††]		
Household Income less than $50,000 (%)		24.8	17.3**
Household Income between $50,000 and $100,000 (%)		36.4	40.9
Household Income between $100,000 and $150,000 (%)		26.5	23.3
Household Income greater than $150,000 (%)		13.3	18.5*
Age	38 (Median)	42.7	47.3***
Female (%)	51.6	85.1	58.5***
Mean Household Size	2.67	3.4	3.2
Households with Children (%)	33.2	58.1	57.7
Bachelor's Degree or Higher (%)	36.9	89.5	82.8***
White (%)	58.6	83.3	78.1*

[†] Source: U.S. Census Bureau, 2011 American Community Survey 1-Year Estimates
[††] Income reported in 2011 inflation-adjusted dollars.
Note: Single asterisk (*), double asterisks (**), triple asterisks (***) denotes that the *t*-test of a difference of the means for the consumer buying club and random sample groups was significant at the 0.10, 0.05, or 0.01 levels, respectively.

Table 2. Ground Beef Attributes in Hypothetical Conjoint Choice Questions

Product Attribute	Levels
Producer	1. Farmer you know 2. Farmer you do not know
Distance Traveled	1. 100 miles 2. 400 miles 3. 1000+ miles
Use of Antibiotics/Hormones	1. USDA Certified Organic 2. Not organic, no antibiotics/hormones 3. Not organic, use of antibiotics/hormones
Livestock Production	1. Pastured 0-3 months of the year 2. Pastured 3-6 months of the year 3. Pastured 6+ months
Price	1. $4.00 2. $6.00 3. $8.00

Table 3. Results from the Conditional Logit Model for the Hypothetical Samples

Variable	Buying Club		Random Sample		Pooled Sample	
	Coefficient	*Robust Standard Error*	*Coefficient*	*Robust Standard Error*	*Coefficient*	*Robust Standard Error*
Farmer you know	0.301***	0.0803	0.268***	0.0782	0.279***	0.055
Distance traveled = 100 miles	0.429***	0.104	0.610***	0.0979	0.509***	0.0707
Distance traveled = 400 miles	-0.0548	0.0994	0.537***	0.0982	0.253***	0.0701
Certified Organic	1.441***	0.107	1.526***	0.121	1.451***	0.0816
Not Organic, No Antibiotics	1.174***	0.103	0.868***	0.119	0.990***	0.0795
Pastured 3-6 months	0.289**	0.102	0.316***	0.0954	0.284***	0.0689
Pastured 6+ months	0.938***	0.108	0.366***	0.106	0.625***	0.0743
Cost	-0.354***	0.0212	-0.225***	0.0226	-0.284***	0.0155
Number of Observations	4218	358 clusters	3843	328 clusters	8061	686 clusters
Pseudo R-Squared	0.1513		0.1364		0.1229	

Note: Single asterisk (*), double asterisks (**), triple asterisks (***) denotes significance at the 0.10, 0.05, or 0.01 levels, respectively.

Table 4. Results from the Conditional Logit Model for the Hypothetical Sample with Interactions

	Buying Club		Random Sample		Pooled Sample	
Variable	*Coefficient*	*Robust Standard Error*	*Coefficient*	*Robust Standard Error*	*Coefficient*	*Robust Standard Error*
Farmer you know	0.316***	0.0803	0.281***	0.0781	0.298***	0.0553
Distance Traveled = 100 Miles	0.296*	0.118	0.499***	0.11	0.386***	0.0793
Certified Organic	1.495***	0.108	1.534***	0.12	1.485***	0.0814
Not Organic, No Antibiotics	1.222***	0.106	0.897***	0.117	1.03***	0.0798
Pastured 6+ Months	0.634***	0.116	0.398***	0.115	0.487***	0.0809
Distance=100mi × Pastured 6mth	0.429*	0.206	-0.425	0.222	0.0347	0.149
Cost	-0.334***	0.0196	-0.173***	0.0201	-0.251***	0.0145
Number of Observations	4218	358 clusters	3843	328 clusters	8061	686 clusters
Pseudo R-Squared	0.1502		0.1223		0.1174	

Note: Single asterisk (*), double asterisks (**), triple asterisks (***) denotes significance at the 0.10, 0.05, or 0.01 levels, respectively.

Table 5. Self-Reported Importance of Attribute in Choices Made

What influenced your choice?

	Production Method	Distance	Price
Buying Club Sample			
Very Important	**86%**	22%	11%
Important	13%	**66%**	**58%**
Not Important	1%	13%	31%
Random Sample			
Very Important	32%	14%	**50%**
Important	**47%**	44%	37%
Not Important	21%	42%	12%
Grocery Store Sample			
Very Important	37%	22%	36%
Important	**42%**	**45%**	39%
Not Important	11%	33%	25%

Table 6. Ground Beef Attributes in Hypothetical Conjoint Choice Questions

Product Attribute	Levels
Livestock Production	1. Grass-fed 2. –
Distance Traveled	1. Raised Within 100 Miles 2. Domestic (U.S)
Price (Coupon Value)	1. $0.50 2. $2.50 3. $4.50

Table 7. Attribute Distribution for In-Store Experiment for the Overall Choices

Attribute	% of Presented Choices	% of Choices Made
Grass-fed	37.87	38.71
Local	37.34	41.39
Grass-fed and Local	18.34	20.97
Not Grass-fed and Not Local	18.99	20.43
No Beef Included	33.33	25.09

Note: By design, 33.33 percent of choices have no beef attached (Gift C).

Table 8. Demographic Characteristics of In-Store Sample

	State[†]	In Store Sample	Random Sample
Number of Respondents	–	279	327
Median Household Income	$70,004[††]		
Household Income less than $50,000 (%)		21.9	17.3
Household Income between $50,000 and $100,000 (%)		40.1	40.9
Household Income between $100,000 and $150,000 (%)		18.2	23.3
Household Income greater than $150,000 (%)		19.8	18.5
Age	38 (median)	56.0[‡]	47.3***
Female (%)	51.6	58.8	58.5
Mean Household Size	2.67	2.7	3.2***
Bachelor's Degree or Higher (%)	36.9	74.5	82.8***
White (%)	58.6	74.8	78.1

[†] Source: U.S. Census Bureau, 2007-2011 American Community Survey 5-Year Estimates
[††] Income reported in 2011 inflation-adjusted dollars.
[‡] Approximations using midpoint of interval from in store sample.
Note: Single asterisk (*), double asterisks (**), triple asterisks (***) denotes that the *t*--test of a difference of the means for the in-store sample and hypothetical random sample groups was significant at the 0.10, 0.05, or 0.01 levels, respectively.

Table 9. Results from the Conditional Logit Model for the Non-Hypothetical Sample

	Without Interaction		**With Interaction**	
Variable	*Coefficient*	*Robust Standard Error*	*Coefficient*	*Robust Standard Error*
Grass-fed	0.377***	0.124	0.614***	0.163
Local	0.675***	0.121	0.911***	0.170
Coupon Value	0.459***	0.053	0.486***	0.055
Grass-fed × Local			-0.531**	0.237
Number of Observations	1674	279 clusters	1674	279 clusters
Psuedo R-Squared	0.0846		0.0901	

Note: Single asterisk (*), double asterisks (**), triple asterisks (***) denotes significance at the 0.10, 0.05, or 0.01 levels, respectively.

Table 10. Results from the Conditional Logit Model for the Non-Hypothetical Sample with Demographic Interactions

	Income		Age		Income and Age	
Variable	*Coefficient*	*Robust Standard Error*	*Coefficient*	*Robust Standard Error*	*Coefficient*	*Robust Standard Error*
Grass-fed	0.377*	0.303	0.724	0.161	0.693	0.602
Local	0.675	0.286	1.662 ***	0.001	1.323 **	0.582
Coupon Value	0.459***	0.055	0.456 ***	0.000	0.442 ***	0.055
Grass-fed × Income	-0.002	0.003			-0.002	0.003
Local × Income	0.003	0.003			0.003	0.003
Grass-fed ×			-0.007	0.009	-0.003	0.010
Local × Age			-0.019**	0.009	-0.017*	0.010
Number of observations	1482	247 clusters	1662	277 clusters	1476	246 clusters
Psuedo-R Squared	0.0846		0.089		0.087	

Note: Single asterisk (*), double asterisks (**), triple asterisks (***) denotes significance at the 0.10, 0.05, or 0.01 levels, respectively.