Product Origin and Reputation for Quality: the Case of Organic Foods

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Introduction

The organics have been one of the highest growth sectors in the agricultural and food industries in recent years. The U.S. sales of organic food and beverages have grown from $3.5 billion in 1997 to $16.7 billion equaling 2.8% of total U.S. food sales in 2006, at an average annual growth rate of 18.3%, while the total U.S. food sales grew at an average annual rate of 3.4% (Organic Trade Association, 2008a; OTA). Organics appear to be increasingly incorporated into the lifestyles of many consumers. In 2008, over two-thirds of U.S. adult consumers bought organic products at least occasionally, with about 28 percent of organic consumers shopping for organic food on weekly basis (OTA, 2008b). On the production side, the overall certified organic acreage grew at an average annual rate of 25% from 1995 to 2005, increasing more than three times to 4 million acres representing 0.51% of the overall U.S. cropland. Since 2000, the number of certified organic farms increased 54% to reach over 10,000 in 2007 (USDA-ERS, 2009). However, the expansion in the organic production has failed to satisfy the rapidly growing demand for organic foods, which has given an open entrance to imports.

The U.S. Department of Agriculture (USDA) estimates show that the value of U.S. organic imports in 2002 was $1.0 to $1.5 billion, accounting for 12-18 percent of the $8.6 billion in U.S. organic retail sales in 2002, while the value of U.S. organic exports was $125 to $250 million (USDA-ERS, 2007a). Unexpectedly in 2008, the value of organic imports into the U.S. far exceeded the value of U.S. organic exports by as much as a 4 to 1 ratio (USDA-FAS, 2008). Canada, Latin America, Asia, and Europe are the major import sources, while the major organic imports include fresh fruits and vegetables, coffee, tropical produce and other products not grown in the U.S., as well as processed food and ingredients for manufactured products (USDA-ERS, 2007a).

In addition to a variety of organic food products shipped from different locations, the "locally grown" concept has become increasingly appealing to consumers, with some evidence of consumers switching from certified organic foods to local, conventional foods (Wells, 2007). "Local" products are consumed by those interested in supporting small farms, community agriculture, sustainability, animal welfare and a host of issues once identified with organic products (Brown, 2003; Darby et al., 2006). The definition of "local" remains ambiguous. Some consumers and retailers define it by mileage or driving distance, while others by political and geographical boundaries. The definitions based on political boundaries vary according to counties where consumers reside, regions (surrounding neighboring states), and also the U.S. (Zepeda and Leviten-Reid, 2004).

Consumers face a challenge in evaluating the quality of a product when it depends not only on the attributes that are observable but also on those that cannot be directly observed, even after purchase and use, known as credence attributes. Thus, consumer's perceptions and preferences play an important role in determine whether or not to consume organic products. For example, some studies have found typical consumers to be willing to pay a premium for organic food products, which are generally perceived as being safer, healthier, tastier, and more environmentally friendly than conventional foods (Corsi and Novelli, 2003). None of these quality attributes can be observed at the moment of purchase or after the items are consumed, requiring a prohibitively costly verification of the production methods.

Since 2002, the National Organic Program (NOP) has established a unified standard for food labeled as organic. Yet, the NOP standards are distinct from consumers' preferred definitions of organic (Conner and Christy, 2004), with many organic producers identifying the USDA standards being too lax or the organic standards not being enforced consistently across various industry participants as a major concern (Peterson and Kastens, 2006). As a matter of fact, evidence presented by Giannakas (2002), showed that although labeling based on third party certification can mitigate asymmetric information problems in organic food, it is not sufficient for alleviating organic food market failures. He concluded that mislabeling is more likely to occur by certified organic producers who can procure conventional product and re-sell it as organically grown and/or by producers of both organic and conventional products who can misrepresent their conventional produce as organically grown. Hidden behind their organic certification, these producers are more likely to be successful in an attempt to misrepresent conventional product as organic.

To support these statements, several examples can be found in recent articles published on the media. In 2006, the Cornucopia Institute, which primary mission is the role of "government watchdog" at the USDA's National Organic Program (Kastel, 2006), presented a complaint concerning violations of the NOP's regulatory standards by the Aurora High Plains Organic dairy, the largest organic dairy producer in the U.S. The accusation was based on the evidence showing the confinement of cows with no access to grazing (contrary to the stipulated in the NOP standards) and utilization of conventional cows in the milking process. Aurora was sanctioned by the USDA after the agency's investigators found 14 "willful" violations of federal organic law and placed in one year probation (Cornucopia Institute, 2009a). Additionally, several cases of mislabeling in seafood including imported farmed salmon being falsely identified as wild Alaska salmon and frozen seafood being marketed as fresh product, or "organic" were reported in 2009 (Buck, 2009).

This type of violations can arise not only among producers, but also at the retail level. According to Kastel (2006), major food processors have recognized the meteoric rise of the organic industry and profit potential, and want to create what is in essence 'organic light,' taking advantage of the market cachet but not being willing to exert efforts required to earn the USDA organic seal. In 2007, Wal-Mart was accused of defrauding its customers by mislabeling non-organic products as organic (Wong, 2007). Furthermore, another U.S. major retailer, Target, was recently accused of misleading consumers into thinking some conventional food items it sells were organic, such as in the case of Silk milk, product that had switched to be produced with conventional soybeans (Cornucopia Institute, 2009b).

In such cases, discerning consumers may turn to the producer reputation as an alternative measure of the organic quality attributes and assurance. Loureiro and Hine (2002) argue that location of food's origin seems to be an important attribute that helps differentiate products and create new niche markets. Also, Lusk et al. (2006) suggest that consumers may use a country's reputation to predict the quality of products, which may be positive or negative. Yet, it remains an empirical question whether or not consumers associate producers from different locations with distinct reputations for organic quality attributes.

The objective of this study is to assess the impacts of product origin on consumers' valuation in the case of organic foods. A theoretical model will be developed to explain the variability in willingness to pay for organic products by product origin and producer reputation. We will consider the case of fresh organic apples because fruit and vegetables account for the largest share of total U.S. organic food sales (37% with totals just under $8 billion in 2008) (Nutrition Business Journal, 2009). Apples are the most highly consumed organic fruit in the U.S (Stevens-Garmon, Huang and Lin, 2007) and are sourced from a variety of locations. Apples are produced in most states and are imported from several countries, mostly in the Southern Hemisphere (Stevens-Garmon, Huang and Lin, 2007).

In the following section, the literature on effects of location-of-origin attributes and reputation for quality on organic foods is briefly reviewed. Following the description of the theoretical model, the details of the survey design are presented. The results section first discusses the data characteristics and then, the results of our hypothesis testing are presented. In conclusion, we discuss implications of our results for the agricultural and food industry.

Relevant Literature

Studies on Product Origin and Organic Products

Location of origin has become the focus of several studies that deal with consumer perceptions of quality for fresh produce, while in processed products it has also been one of the attributes of interest, because of its implications for quality differentiation. Thilmany, Bond and Bond (2006), Karipidis and Galanopoulos (2000), and Scarpa, Thiene and Marangon (2008) are some examples of studies that analyze the effect of location of origin in fresh produce, while Hu, Woods and Bastin (2009) and Gubanova et al. (2008) are examples for processed products. In the case of organics, however, there is few evidence of product differentiation using the "origin" attribute.

In contrast, there are several studies that compare the impact of the organic claim versus the location of origin claim, in the consumer purchasing behavior. Loureiro and Hine (2002) used contingent valuation techniques to compare the consumers' willingness to pay (WTP) for local, organic and GMO-free potatoes in Colorado. They conducted a consumer-intercept survey in supermarkets in different locations of the state of Colorado, and in total 437 questionnaires were collected. Respondents in their study were willing to pay a 10% premium for "Colorado grown" potatoes over the ones labeled with organic and GMO-free claims. They also indicated that although consumers are willing to pay more, there must be certain quality linked to the product in order to pay the premium. Furthermore, consumers who preferred to purchase organic potatoes were the ones concerned about food safety and the ones with a higher education level.

Similarly, James, Rickard and Rossman (2009) studied the differences in WTP for applesauce in Pennsylvania using choice experiment valuation. They distributed a survey to 3,000 residents in rural Pennsylvania and over 1,500 responses were collected (56% response rate). The product was differentiated by “organic”, “Pennsylvania preferred”, “no sugar added” and “low fat” labels. The locally grown designation was associated with the highest WTP implying the largest positive effect on the likelihood of a product been selected. “No sugar added” was the second most valuable attribute, and “organic” the third. Further, the likelihood of selecting a product varied across consumers with different levels of knowledge of the attributes, which was measured by their consumption of organic and local products in the past year. The results indicated that the presence of organic attribute decreased the likelihood of a product being selected for those consumers who did not consume organic and local foods in the past year, as opposed to those who reported previously purchasing organic food. For those consumers who had frequently purchased local and organic food, the presence of “Pennsylvania preferred” attribute had a positive impact in their likelihood of select a product.

Vander Mey (2004) conducted two surveys in South Carolina and across the U.S. to analyze consumer preferences towards food differentiated by several attributes including origin and organic claims. The South Carolina survey had 201 respondents and the nationwide survey had 819 respondents. One relevant finding was that American consumers preferred U.S. grown and processed foods over imported foods. Also, results indicated that grown under sound environmental practices, grown or processed under safe conditions, locally grown, grown in U.S., and grown organically, were the top five product claims for which the majority of consumers were willing to pay more.

In the consumer economics literature, there are several studies dealing with the assessment of consumer perceptions towards origin claims. Mabiso et al. (2005) collected data from primary shoppers in Florida, Georgia and Michigan using a Vickrey (fifth-priced sealed bid) experimental auction and a survey questionnaire to provide a sample of 311 observations useable for analysis. He found that 79% and 72% of the consumers surveyed were willing to pay a premium for apples and tomatoes labeled as “grown in the U.S.” respectively. Quality perceptions and trust in information received from U.S. government agencies were found as critical factors driving the consumption decision making process of respondents. It was also found that those consumers who take food safety concerns into consideration were willing to pay a higher premium for the “U.S. grown” label. Loureiro and Umberger (2005) found similar results for meat products; consumers perceived certified U.S. meat as being safer than meat from major exporting countries consistent with the findings from previous studies they cited. To elicit consumer's WTP they used dichotomous choice questions. Five thousand surveys were mailed to households in the continental U.S., and 632 returned complete (13% response rate).

Several other studies pointed out food safety as one of the reasons to choose products according to their designation of origin (Lobb and Mazzocchi, 2006; Puduri, Govindasamy and Onyango, 2006; Dinopoulus, Livanis and West, 2005). Ehmke (2006) performed a meta-analysis using 13 country-of-origin (COO) studies with 27 consumer WTP estimates to determine significant trends in the COO literature. Findings suggest that credence attributes such as organic production and traceability have a significant positive effect on the value of own COO. Also, results indicated that consumers in different areas of the world tend to have significantly different own COO values. Ehmke, Lusk, and Tyner (2008) used a conjoint experiment to examine COO preferences among consumers from different countries. In total, they used 346 student subjects from different locations to conduct the experiment and the survey. Despite the expected response from consumer to prefer products from their own country, results indicated that COO information was not as important as genetically modified content information in France, U.S., and Niger, or organic production information in China. Also, individuals with quality and food safety information needs placed higher importance on genetically modified and organic food information than on COO information.

In association with origin claims, availability of the so-called "local" foods had impacted the consumer purchasing behavior in the past years. One determinant of the success of specialty or local products is the collective reputation of the product. When the collective reputation of the product is good, the designation will be a powerful tool to signal quality (Winfree and McCluskey, 2005). Zepeda and Leviten-Reid (2004) performed a focus group study using 43 primary food shoppers to investigate consumer perceptions towards local foods. Results show that organic food shoppers were more willing to purchase local foods compared with conventional food shoppers. Also, consumers indicated that their willingness to purchase local foods was related to the perception of direct benefits to the environment, to the local community, to farmers, and to their personal health. In addition, Darby et al. (2006) used a customer-intercept survey of 530 food shoppers in a variety of direct markets and traditional grocery stores in the state of Ohio. Using choice experiment as their valuation method, they found that consumers were primarily paying a premium for the freshness of locally grown produce and also for supporting family farms or small scale agriculture, and for better taste.

In contrast, Zepeda and Li (2006) found that attitudes about nutrition and health, energy conservation, and the importance of farmers receiving adequate prices had no significant effect on the willingness of purchasing local foods. However they found that the variable “enjoying cooking very much” which is associated with knowledge of food and food quality was significant, affecting positively the intentions to buy local foods by 32%. They used data from a national survey of 956 food shoppers (522 were mail surveys and 434 telephone surveys) to estimate a Lancaster-Weinstein model using probit analysis. Adams and Adams (2008) calculated WTP for local foods using data from 97 consumer-intercept surveys conducted at two farmer’s markets in Florida. They found out that 86% of the consumers surveyed were willing to pay a more than 30% premium for locally grown, fresh produce. Consumer demographic characteristics demonstrated that female shoppers were willing to pay more for local foods than male, as well as consumer engaged in gardening activities over the ones who are not.

Studies on Collective Reputation

In the theoretical framework, a situation in which consumers decide whether or not to purchase and what products to purchase given their perception of the quality level of output produced by the farms in different locations is considered. Thus, for products originating from a region with a reputation of being high quality (i.e., adhering to organic farming practices according to the NOP standards), consumers are willing to pay a higher premium. Products of low quality are produced using farming practices that do not meet the NOP standards. The production of high quality products entails higher costs. A higher premium provides a greater incentive to exert the costly effort to follow organic practices compared with that for the firms located in regions without such reputation. Because of heterogeneity among producers in production costs, consumers always entertain the possibility that a given product that is claimed to be organic was, indeed, produced without following the NOP standards, which are below the consumers’ preferred quality (Conner and Christy, 2004). And so, the reputation of a growing region depends on the belief of the consumers about the share of the producers in the region who follow organic practices according to the NOP standards.

In the economics literature, several approaches to model collective reputation can be found. According to Mailath and Samuelson (2006), reputation is the situation where agents believe a particular agent to *be* something (i.e., a case of adverse selection), which is different to the situation where agents expect a particular agent to *do* something (i.e., a case of moral hazard), usually referred to trust. This distinction is sometimes blurred and the two approaches can be combined to obtain a richer framework in which one can analyze formation of reputation. Bootstrap mechanism based on repeated interaction is the approach that has been used to model trust, and Bayesian updating based on the history of performance and experiences with the product is used to model reputation.

Before discussing the model in greater detail, some examples of studies dealing with collective reputation from a general perspective are reviewed. Carriquiry and Babcock (2005) developed a repeated-purchases model under three different scenarios -monopoly, duopoly with collective (public) reputation, and duopoly with private reputation- to explore which factors control the choice of different quality assurance systems, and compare the welfare of processors and their customers. They concluded that monopolist will invest more heavily in quality assurance than duopolists, because they are the ones that will lose the most if a quality deviation occurs and is detected. On the other hand, when reputation is public, processors find incentive to invest in quality assurances if their rivals also invest, otherwise they do not invest. Also, in this case duopolists will reduce their expected quality, because they may obtain higher levels of benefits by free riding on the efforts of other chain participants. In the case of duopoly with private reputation, processors find worthwhile to invest in quality assurances when their rivals are not, and to reduce their own expenses to capture higher profit, otherwise. Finally, in terms of welfare, they suggested consumers prefer the duopoly with private reputations over the other two scenarios considered. However, in cases when consumers can easily observe the level of quality, they will prefer the monopoly over the duopoly with public reputations.

Fishman et al. (2008) presented two theoretical models to compare the "reputation effect of branding" in collective brands and individual firms. They showed that despite the incentive to free ride, members of collective brands have a greater incentive to invest in quality than individual firms. Small firms may be unable to establish individual reputations on their own, and therefore invest in quality. In such cases, they concluded collective branding increases the value of reputation, and incentive firms to invest in quality. However, if brand can deter free riding by perfectly monitoring member's investment in quality, it will not always be the case when brand is unable to monitoring. Thus, brand will need to keep from getting to large, otherwise the incentive of free riding will override the reputation effect.

Winfree and McCluskey (2005) presented a collective reputation model in which reputation is modeled as a common property resource. They analyze a differential game in which all players choose their control variables (product quality) simultaneously and jointly influence the dynamic process that governs the evolution of reputation. They argued that in a collective reputation scenario, as the number of firms increases the average quality decreases. They stated that when the returns to quality are diluted but the costs are not, firms have a lower incentive to provide quality. As a possible solution, they suggest the implementation of minimum quality standards that should be controlled by the group. However, if this solution is not feasible, they proposed so called "trigger strategies" which is a way for firms to threaten other firms if they deviate, or defect, from some optimal path. In this case, the threat is producing a lower quality so that the defecting firm will lose profits from lower reputation.

Some applications of modeling collective reputation in the food industry were reviewed as well. Revoredo and Fletcher (2005) analyzed the empirical evidence showing that groundnuts' country of origin is an important variable in explaining groundnuts prices in Rotterdam. They showed that despite being from the same quality (i.e., same observable characteristics), groundnuts from U.S. received a higher premium compared to the rest of the origins. They suggested that the "suppliers' reliability" might be an element explaining part of the price premiums. In the absence of statistical evidence, they developed a theoretical model to support this idea. Based on the model results, in which an imported compares two possible suppliers -one traditional and reliable supplier and one newcomer- they concluded that price premium might be explained by the importers' perception of the supplier's reputation.

McCluskey (2000) and McCluskey and Loureiro (2005) emphasized in their studies, the importance of reputation when a product has unobservable quality attributes (credence attributes), particularly for those products with claims of using special production standards (i.e., organic foods). They concluded that an increase in monitoring is needed in order to find some reward mechanism for encouraging firms to produce high quality, which can increase the true level of product quality in the market for goods with unobservable production standards (credence goods).

Quagrainie, McCluskey and Loureiro (2001) analyzed the reputation of Washington apples through the estimation of price premiums using a dynamic multiple-indicator multiple-cause framework. This procedure suggests that price premiums are good indicators of reputation.

Because the reputation variable was common for all apple varieties used in the analysis, the situation conveys into a collective reputation analysis. These results are similar to those reported by London and Smith (1997) in the case of Bordeaux wine, and Scarpa, Thiene and Marangon (2008), where reputation is found to have a large impact in the consumers' willingness to pay.

Theoretical Model

Collective reputation of origin in organic fresh fruits and vegetables producers is the conceptual foundation of our analysis. The theoretical framework of the study is based on Tirole's (1996) approach to modeling collective reputation, i.e., the reputation of a growing region or a group of producers, for quality. He modeled the idea of group reputation as an aggregate of individual reputations, where the current incentives of a member are affected by his past behavior as well as by the past behavior of the group, because his track record is observed only with noise. The model consider a setting that combines the elements of adverse selection and moral hazard in which consumers form beliefs about the share of producers who are properly following organic standards in a specific location. In this study, the Tirole's model is applied to an organic agricultural market.

Consumers are willing to pay more for products from regions that have the reputation of producing higher quality organic food products. This reputation may be self-sustaining because producers in regions that have a reputation for high quality have a greater incentive to follow organic standards. This is because failure to adhere to the organic practices may result in the producer's loss of the organic certification, which is more valuable in the regions with high reputation. The market is supplied by producers from various regions. In each period, t, consumers perceive the region's average quality of organic products produced in the preceding period, t-1. A product's perceived quality is worth either high (H) if producers are adhering to organic farming practices according to the NOP standards, or low (L) if producers follow farming practices that do not meet the NOP standards. In the current application to organic foods, the unobservable credence attributes are assumed to be translated into public and private benefits perceptions. It is also assumed that consumers are risk neutral and offer a price equal to their willingness to pay based on the expected quality of the product produced in certain region. In a production region, a continuum of firms supplies organic products each period $t = 1,\ldots,\infty$.

The cost of following organic practices is $c \in [0, \bar{c}]$, which is distributed among producers in accordance with the distribution function $F(c)$. Unlike Tirole's model, a cost distribution function was used to differentiate the type of producer in a specific region. Thus, the producers incurring some costly effort are the ones providing high quality food products and producers exerting no effort are those producing low quality food products.

Each firm stays in the industry with probability λ. If a firm does not follow organic practices and sells its products in the organic market in period *t*, it will be detected in any of the subsequent periods with probability χ. The firm that is caught cheating exits the market, which can be interpreted as a complete loss of reputation. For each exiting firm (either due to the normal competitive process or because the firm is excluded from the organic market following the detection of false claims), a new firm immediately enters the market. The cost of producing organic foods *c* for this new firm is independently drawn from $F(c)$. Producers discount future payoff at rate δ.

Suppose that in equilibrium there exists a threshold value $\hat{c}$ such that all producers with $c \le \hat{c}$ follow organic practices and all producers with $c > \hat{c}$ do not. In the long run, the share of the firms who follow organic practices is given by:

(1) $$F(\hat{c})(1-\lambda+(1-\lambda)\lambda+(1-\lambda)\lambda^2+\ldots)=F(\hat{c}),$$

and the share of the firms who do not follow organic practices is given by:

(2) $$(1-F(\hat{c}))(1-\lambda+(1-\lambda)\lambda(1-x)+(1-\lambda)(\lambda(1-x))^2+\ldots)=(1-F(\hat{c}))\frac{1-\lambda}{1-\lambda(1-x)}.$$

To understand the last expression, note that the firms that do not follow organic practices exit at a higher rate than the firms that follow organic practices because some of the non-followers will be caught cheating and excluded from the group before their natural lifetime in the industry ends. Hence, the expected quality consumers are willing to pay each period can be written as:

(3) $$p=\frac{F(\hat{c})}{F(\hat{c})+(1-F(\hat{c}))\frac{1-\lambda}{1-\lambda(1-x)}}H+\frac{(1-F(\hat{c}))\frac{1-\lambda}{1-\lambda(1-x)}}{F(\hat{c})+(1-F(\hat{c}))\frac{1-\lambda}{1-\lambda(1-x)}}L.$$

Let $V(c)$ denote the value function of a producer with cost c who has not been detected as cheating in the past. If the producer follows organic practices he earns:

(4) $$V(c)=p-c+\delta\lambda V(c).$$

Simplifying (4):

(5) $$V(c)=\frac{p-c}{1-\delta\lambda}.$$

In each period each producer follows organic practices if:

(6) $$p-c+\delta\lambda V(c)\geq p+\delta\lambda(1-x)V(c).$$

Simplifying (6):

(7) $$c\leq\delta\lambda xV(c).$$

Let $\hat{c}$ denote the threshold cost that solves this equality:

(8) $$\hat{c}=\delta\lambda xV(\hat{c}).$$

Substituting from (5) yields

(9) $$\hat{c}=\delta\lambda x\frac{p-\hat{c}}{1-\delta\lambda}.$$

This expression is equivalent to:

(10) $$\hat{c}=\frac{\delta\lambda x}{1-\delta\lambda(1-x)}p$$

Substituting from (3) and for simplicity, setting $H=1, L=0$ yields:

(11) $$\hat{c}=\frac{\delta\lambda x}{1-\delta\lambda(1-x)}\frac{F(\hat{c})}{F(\hat{c})+(1-F(\hat{c}))\frac{1-\lambda}{1-\lambda(1-x)}}.$$

A low quality equilibrium (no organic output) with $\hat{c}=0$ always exists. In the case of the uniform distribution, $F(c)=c$, on $[0,1]$, the detection rate $x=1$, implies:

(12) $$\hat{c}=1+\delta-\frac{1}{\lambda}\in(0,1)\text{ if }\frac{1-\lambda}{\lambda}<\delta<\frac{1}{\lambda}.$$

Equation 12 implies that if the expected life-span of an organic producer is sufficiently long (i.e., the probability of staying in the industry λ, is close to one), there exist an equilibrium in which a positive share of producers, $1+\delta-\frac{1}{\lambda}>0$, follows organic practices.

The above framework implies that when growing regions differ by the parameters such as the survival probability, λ, the detection probability, χ, the discount factor, δ, and the distribution of the costs of following organic practices across the growers in the region *F*(*c*), the regions may converge to distinct equilibria with varying proportions of producers adopting organic practices. The shares of producers who follow organic practices, in turn, determine the reputation of the regions for producing high quality organic food products and the differences in the premiums that consumers are willing to pay for organic products from different growing regions. This is a testable hypothesis that explains the variability in consumers' valuation of organic foods from various locations.

It is difficult to directly estimate either the probability with which producers, who shirk the efforts required by the NOP standards but market their product under the organic claim, or the probability with which such false claims are detected. Instead, inferences can be made from observing the equilibrium conditions, production cost values for conventional and organic production, and consumers' willingness to pay.

Empirical Analysis

To empirically examine our main hypothesis that willingness to pay for organic products depends on what consumers know about the food's origin and its reputation for quality, we collected data from a survey that was administered through an online research company to a random-sample of 285 households across the U.S. The survey consisted of four sections. In the first section, we elicited consumer's food shopping habits for conventional and organic products, including the frequency of consumption and the locality of the stores. The second section asked consumers about their preferences towards conventional and organic fresh fruit and vegetables, and tested consumer knowledge of organic and local foods. The third section contained the valuation questions, and in the last section, demographic information was collected.

The choice experiment (CE) was selected as our valuation method, because it is easier to add additional quality attributes than in contingent valuation and experimental auction methods and it is consistent with Lancaster's theory (1966) of utility maximization (Gao and Schroeder, 2008). The respondent was asked to choose between two 3-pound bags of fresh gala apples differentiated by five attributes with their respective levels (figure 1). We included the "neither" choice in each set for those respondents who did not feel attracted to either product (Lusk and Schroeder, 2004). The five attributes were: price, production process, product origin, scale of farm, and type of retail store. The price level was set at 30-cent increments above and below $3.49, which was the national average retail price for a 3-pound bag of conventional gala apples, reported in the weekly National Fruit and Vegetable Retail Report by the Agricultural Marketing Services from September 2008 to June 2009 (USDA-AMS, 2009). The production process had two levels: "certified organic" and "conventional". The conventional property was explained to the respondent as the assumed production method for apples with no specific claim for production attributes, which would involve the use of approved chemicals to control for pests and weeds. The definition for the certified organic label stated that apples were produced and packaged according to the National Organic Standards regulated by the U.S. Department of Agriculture.

The product origin attribute referred to the location where apples were produced, including: “local”, “regional”, “national” and “Chile”. Local apples were defined as “harvested from orchards in your area.” Regional apples were “harvested from orchards in your region” and for reference to the respondents, the U.S. Department of Agriculture’s grouping of the 48 states into 10 regions was provided. National apples were “harvested in the U.S.” and Chilean apples were “harvested in and imported from Chile.”

The scale attribute corresponded to the type and acreage of farm (or orchard) where the apples are grown. Thus, we selected the “small” and “large” attribute levels. The definitions for these attribute levels were based on the USDA categorization for farms and the apple orchard classification established in the 2002 Census of Agriculture. A “small” farm was defined as “an orchard with less than 25 acres or where the annual market value of agricultural product sold is less than $100,000” (USDA-NASS, 2002; USDA-ERS, 2007b). A “large” farm was defined as “an orchard with more than 60 acres or where the annual market value of agricultural product sold is more than $250,000.” Finally, to represent where consumers purchase apples, “mass-market supermarket”, “natural grocery store”, and “independent food store” were specified as the attribute levels for the types of retail outlets. These outlet types were selected considering their importance in the organic retail sector. Altogether, they represented approximately 93% of U.S. organic food sales in 2005, according to the organic food channel distribution, presented in the OTA’s 2006 Manufacturer Survey. A mass-market supermarket was defined to the respondents as “a large store offering a wide variety of food and household merchandise, such as Wal-Mart Supercenter and Kroger store.” A natural grocery store was defined as “a large store offering a variety of "natural" and organic food and household products, such as Whole Foods Market and Wild Oats Natural Marketplace.” An independent food store was defined as “individually owned and operated retail shop, with no more than several storefronts” (USDA-ERS, 2002).

The OPTEX procedure of SAS software was used to generate the choice experiment design, using the modified Fedorov algorithm (SAS Institute Inc., 1999). Fractional-factorial designs that are both orthogonal and balanced are optimal. In orthogonal fractional-factorial experimental designs, each level of each attribute of a specific product is combined with every level of all other attributes of the same product. A design is balanced when each level occurs equally often within each factor (Kuhfeld, 2009). The D-efficiency criterion evaluates the precision of the design in percentage values. Our experiment design with 18 choice scenarios yielded a D-efficiency value of 91.4. Too many choices in a given setting can be overwhelming for individuals to evaluate (Gao and Schroeder, 2008). Thus, in order to minimize respondent fatigue, the choice scenarios were grouped into three, so the respondents would only be asked to complete six choice tasks.

The survey responses were analyzed using a conditional logit model to obtain WTP values for all attributes. Statistically significant differences in consumer's valuations for products with similar attributes but different origin would be consistent with our main hypothesis.

Results

An online survey was conducted during the first week of July in 2009. In total, 285 surveys were sent to respondents within the continental U.S. through a well known research firm, and 234 were successfully completed (82% completion rate). The survey was presented on 18 pages, requiring 23 minutes to be completed on average. At the beginning of the survey, the respondents were screened to ensure that all respondents were responsible for at least half of their household grocery shopping and consumed fresh fruit and vegetables. Consequently, 3.9% (11 respondents) dropped out the survey with these questions. At the end of the survey, the respondents were redirected to the research firm's web page to receive compensation. The distribution of the completed surveys was 81, 76 and 77 among versions 1, 2 and 3, respectively.

Respondent Characteristics

The respondents were mostly female (86%) with post high school education (88%). The age and household income distributions of the respondents are compared to those of the U.S. population in table 1. The sample represents proportionally fewer households earning over $100,000. In terms of ethnicity, the sample was slightly less diverse than the U.S. population, with 79% of respondents identified as white, compared to 74% of Americans according to the 2007 Census

Bureau estimates. Finally, the respondents were geographically more concentrated in the Western and Southern regions, with 12 and 6 percentage points more respondents than the actual population in those regions, respectively, and 9 percentage points less respondents in each of the Northeast and Midwest regions.

Preferences and Perceptions

The respondents were asked how much trust they placed in the accuracy of the certified organic and location-of-origin labels using a 5-point scale where 1 equaled no trust and 5 equaled complete trust. Regarding the “certified organic” label, only 20% indicated complete trust, and 47% somewhat trust, while the remaining 22%, 6%, and 5% demonstrated indifference, little trust, and no trust, respectively. Similarly, 20% respondents indicated to place complete trust, 43% somewhat trust, 26% indifference, 6% little trust, and 5% no trust for the “location of origin” label.

In order to get a sense of what motivates consumers when deciding to shop for fresh fruits and vegetables, respondents were asked to rank a set of product attributes that drives their decision on a scale from 1 equaling “Not at all Important” to 5 equaling “Extremely Important”. Means and standard deviations of each attribute variable are reported in table 2. The two equally most important attributes to respondents were freshness and taste, followed by appearance and risk of food poisoning. The certified organic attribute of fresh fruit and vegetables that are grown under USDA certified organic cultivation methods, was the lowest ranked among the included attributes. This result is consistent with the findings of Thilmany, Bond, and Bond (2006) who explained that specific claims (e.g., pesticide-free) might be more compelling to consumers than multi-dimensional certifications.

In response to the same question but this time with regard to *organically grown* fresh fruits and vegetables, we found that respondents considered taste and nutrition as the most important product attributes, followed by minimal chemical use. For respondents, attributes such as “supporting viable farming operations” and “promotion of social justice” were less important (Table 3). In the instructions, the respondent was given the alternative to choose “not at all important” in case they did not consume organically grown products. Similar to Bellows et al. (2008), our results support the findings of the existent literature in which organic consumers’ interests in private product benefits (such as health, taste, freshness) usually exceed public benefits (e.g., environmental well-being).

Similarly, we asked respondents to rank the attributes related to where organically grown fresh fruits and vegetables come from (origin), and the farms that produce them (farms) and the stores where fresh fruit and vegetables (not necessary organic) can be purchased (stores). In the instructions, the respondent was given the alternative to choose “not at all important” in case they did not consume organically grown products. In the case of origin, “supporting the farming community” and “the reputation of a location regarding its products” were the most important attributes identified by respondents. The responses indicated that consumers perceive farms’ reputation as an important attribute. In contrast, the amount of fuel needed to reach the consumer was the least important attribute (Table 4). As for farm-related attributes, identifying farms that follow environment-friendly farming practices and the ones who are officially certified organic were the most important, as well as the ones who treat its on-farm labor fairly and the ones that are located in the U.S. while being a family farm and personally knowing the farmer(s) were the least important (Table 5).

Next, the respondents were asked to identify products as being local or regional, in order to distinguish local products from regional products (Figure 2). The option to respond “I am not sure” was offered in case the respondent cannot differentiate to which category a product belongs. In terms of driving distance, 76% of the respondents defined those fresh fruit and vegetables produced within a 50-mile radius (about 1-hour driving) from where they lived as local, while 48% and 56% defined as regional to those fresh fruit and vegetables produced within a 100-mile radius (about 2-hour driving) and 250-mile radius (about half a day driving) from where they lived, respectively. The 500-mile radius (about one day driving) was considered as neither local nor regional by 50% of the respondents. These results can be compared to those presented by James, Rickard and Rossman (2009), where their sample defined locally-grown food as being produced within 100 miles of where it is marketed.

The distinction between local and regional in terms of political boundaries resulted in a more diverse assessment. Only 38% defined as local to the fresh fruit and vegetables produced within their county. Regional produce were defined as those produced within their state by 59% of the respondents, and produced within states bordering their state by 45% of the respondents. Fresh fruit and vegetables produced within states bordering their state, including Canada and

Mexico, and produced within the contiguous 48 states, were regarded as neither local nor regional by many respondents (69% and 71%, respectively).

With the purpose of measuring reputation associated with origins, respondents were asked to rank a set of location-of-origin labels based on how they perceived the overall quality of fresh fruit and vegetables on a scale from 1 equaling "Poor" to 5 equaling "High," The option to respond "I don't know" was offered in case the respondent have never came across to produce from certain origin (Table 6). Results indicated that locally-grown fresh fruit and vegetables, as well as those grown in their region, were the highest ranked by respondents (53% and 42%, respectively) among all regions, while the lowest ranked were those imported from China (21%). Also, considering imported fresh fruit and vegetables only, respondents ranked the produce from South America higher than Australia, Europe, or China. A possible explanation to these findings is the fact that consumers may associate quality and freshness with the proximity of where the fruit and vegetables are grown, implying that local produce travels over shorter distances (Zepeda and Li, 2006).

Finally, respondents were asked to compare fresh fruit and vegetables from different origins by assessing a set of attributes (appearance, availability, environmental impact, flavor, freshness, nutrition and safety) on a scale of 1 equaling "Definitely inferior" to 5 equaling "Definitely superior", with the option to respond "I am not sure". Respondents first compared "locally-grown" versus "imported organic" fresh fruit and vegetables. In this case, the average respondent ranked all attributes of "locally-grown" fresh fruit and vegetables as superior, giving the highest value to freshness and safety attributes. In other words, respondents were most concerned about the safety and traveling distance associated with imported organic produce (Table 7). Likewise, when respondents compared "U.S. grown organic" to "imported organic" fresh fruit and vegetables, U.S. grown products were ranked superior with respect to all attributes. Here, the highest ranked attributes were freshness and environmental impact (Table 8). In the last comparison, where respondents were asked to evaluate "U.S. grown organic" versus "locally grown" fresh fruit and vegetables, the average scores hovered around the "about the same" ranking, with a tendency of favoring "U.S. grown organic" produce (Table 9).

Value of organic produce attributes

A conditional logit model that specifies the probabilities of chosen alternatives as functions of the attributes of the alternatives was estimated using the survey data (equation 13). The type of retail store (mass-market, independent, and natural) was represented by two dummy variables (*INDEP* and *NATU*) with *MASS* (mass-market) as the base. The production process (organic and conventional) was defined by a binary variable, *ORG*, with *CONV* as the base. Location of origin (local, regional, national and Chile) was specified by four dummy variables, *LOC*, *REG*, *US*, and *CHI*, and finally, the size of the originating orchard (small and large) was expressed as a binary variable, *SM*, with *LAR* as the base. Thus, together with price, *P*, the model included nine attribute variables:

13) $$V_{ij} = \beta_{price}P + \beta_{natural}NATU + \beta_{indep}INDEP + \beta_{org}ORG + \beta_{local}LOC + \beta_{region}REG + \beta_{national}US + \beta_{overseas}CHI + \beta_{small}SM$$

The results obtained using SAS are presented in table 10. The standard errors for the WTP estimates were computed using the delta method. The likelihood ratio test suggested the overall model was highly significant. The likelihood ratio index is reported, although it has little intuitive interpretation of goodness-of-fit beyond being bound between 0 and 1 (Greene, 2003 p.831). All coefficients and the WTP values were statistically different from zero at the 1% level, except for the coefficients *NATU* (statistically significant at the 10% level), and *INDEP* (not statistically significant), and the WTP values for NATU and INDEP (also not statistically significant). Thus, respondents distinguished the production process, product origin and type of farm attributes, but not the type of retail outlet, from the base attributes. In table 10, the WTP for the location of origin attributes are reported as differences from the $4.09 base price for 3-lb bag, conventional apples from the U.S. Also, the WTP were computed as percentages from this base price in the right-hand column.

Regarding the production process, the respondents were willing to pay a $ 0.15 average premium for organic gala apples in 3-pound bags than for conventional ones (3.7% premium over the base price). These results are similar to the ones found in Bond, Thilmany and Bond (2008), where the average organic premium for New Red Fire lettuce in 4-ounces packages was 3.67%. Regarding the size of the originating farms, the average willingness to pay for apples produced in small orchards (orchard with less than 25 acres or where the annual market value of agricultural product sold is less than $100,000) was $0.08 higher than those produced in large orchards (2.05% premium).

The location of origin was the attribute of interest. Respondents were willing to pay on average $0.25 (6.19% premium) and $0.15 (3.73% premium) for locally-grown and regionally-grown gala apples in 3-pound bags, respectively, over the base. However, the average WTP premium for Chilean apples was -$0.34 (8.28% discount) over the base. Thus, the findings revealed clear preferences of the average respondent towards domestic produce over foreign produce, and among all domestic origins, towards locally-grown. These results are consistent with the documented interest in local foods around the nation. Taking the differences in the percentage premiums for local and organic apples indicates that respondents were willing to pay 2.5% more premium for locally-grown produce than for organic produce.

Model Validation

The theoretical model shows that in equilibrium not all organic producers in a given region may follow organic practices: low-cost producers are more likely to adhere to costly organic standards than high-cost producers. In order to examine the producers' reputation model empirically, we made use of the production cost data for conventional and organic apples obtained from the literature. Due to the lack of sufficient cost data we only considered the average increase in costs due to following organic or conventional practices. Our hypothesis can be tested by comparing the regional cost estimates with the willingness to pay for the location of origin attribute obtained from the survey. We assumed the costs are normally distributed around the average estimate of the increase in the production costs from conventional to organic apples in each region.

Despite the importance in comparing the economic performance of an apple orchard from different production systems (e.g., organic versus conventional), there are few studies that make this comparison, and furthermore, it is difficult to obtain reliable and consistent estimates of the production costs for conventional and organic farmers from the same location and from the same time period, specially from locations outside the U.S. Glover et al. (2002) performed a cost of production analysis of apples orchards managed under conventional, integrated and organic production systems, in the Yakima Valley of Washington State from 1994 through 1999. The financial data reflected greater costs associated with organic production as compared with conventional production. Since their findings pertained to the largest apple producing state in the U.S., these production costs were considered as representative of that for "regionally-grown" organic and conventional apples (among the four location of origin levels). Additionally, in a 2001 FAO publication, a case study of Argentina provided information about the development of the organic export sector in this country and contained the production cost estimates of organic and conventional apples from 1995 through 1997. For the subsequent analysis, these production costs were used to represent the category of “imported”. Because our aim is to compare the increases in costs due to organic practices across different locations, the situation of not having the current cost data might not be relevant. However, it is likely that this increase in costs has diminished over the recent years. All the model estimates are presented in table 11.

The production cost data were used to estimate the average cost of producing one pound of organic and conventional apples in each location (regional and imported) and in the same time period (1996). Then, the average increase in cost due to growing organic apples is needed to estimate the production cost distribution function for each location. Using equation (1), the share of producers who follow organic practices is calculated assuming the distribution of costs is uniform. Equation (2) utilizes this value to determine the share of producers who do not follow organic practices. The values calculated from equation (1) and (2) are used in equation (3) to estimate the average price (p) that a consumer is willing to pay for a 3-pound bag of organic apples from each location. The value of H (high quality) can be obtained using the highest WTP of organic apples among the four locations of origin, while the value of L (low quality) can be obtained using the lowest WTP of conventional apples among the same locations.

To estimate the threshold cost ($\hat{c}$) for each location (equation 10), we assumed each producer from each location stays in the industry for one more year with a probability of 0.90 ($\lambda = 0.90$). In addition, we assume that organic producers are detected with a probability of 0.98 ($\chi = 0.98$), if they are not following organic practices. The discount rate is set at 0.95 (δ= 0.95). The actual share of producers whom consumers perceive as following organic practices can be estimated as the difference between p (the WTP calculated based on the reputation model) and the lowest WTP estimated from the survey responses among all locations, divided by the difference between the highest and lowest WTP values estimated from the survey responses.

Results showed that the price (p) estimated through the model, which is equivalent to the consumer WTP, is higher for the apples produced in the state of Washington compared to the ones produced in Argentina. These estimates are consistent in terms of rank with the WTP from regional and imported apples from the empirical results. Surprisingly, the threshold cost ($\hat{c}$) is higher for the U.S. "regional" apples ($3.30 per 3-pound bag) compared to the "imported" ones from Argentina ($3.29 per 3-pound bag). A higher value of ($\hat{c}$) indicates that a smaller share of producers in the state of Washington are following organic practices compared to the producers in Argentina. A possible explanation to this result might be the fact that the calculation of the average increase in the cost of producing organic apples is not capturing the actual distribution of the production costs among producers. On the other hand, when we estimated the share of producers following organic practices from each region, the state of Washington obtained the higher percentage (98%) compared to (95%) for Argentina, indicating that consumers perceived organic apples from the state of Washington as being of higher quality, which might be a sign that product origin carries reputation for following organic practices.

Although it is not possible to determine whether consumers differentiate between organic apples from different locations by quality reputation, the current analysis gives sufficient directions on how the prediction of the reputation model, which relates the distribution of the production costs to the premium for organic produce, can be tested using a more complete set of organic production cost estimates.

Conclusions

This study contributes to our knowledge of consumer demand for organic fresh fruit and vegetables. While consumer demand for attributes of organic foods such as food safety, nutrition, taste, low pesticide residue and environment conservation, have been the subject of many studies, this study focused on the location of origin. Among the levels of the location attributes included in the assessment, the "locally grown" label was associated with the highest average WTP. The "regionally grown" designation was the second most preferred, "U.S. grown" the third, and "imported" the least. In the survey, respondents valued fresh fruit and vegetables coming from South America and Australia the highest among the importing sources included in the survey, followed by those produced in Europe, while they perceived those from China as having the lowest quality. Based on these results, it can be concluded that U.S. organic fresh fruit and vegetables, especially those grown locally, are preferred over the ones from any foreign origin.

Another contribution of this study is the insight obtained about how the trends in organic and local foods might change over time. Although the premium for the local label (6.19% over the base) was higher than the premium for the organic label (3.70% over the base), which is consistent with Loureiro and Hine (2002), Vander Mey (2004), James, Rickard and Rossman (2009), it is likely that the difference in premium between both labels will narrow over time. The current trend among local foods may decline as more fresh fruit and vegetables are labeled with the locally grown designation.

In the case of organic foods, because our findings suggest that consumers distinguish organic foods that are domestically produced and marketed from imported organic foods, it can be concluded that the organic market is not homogeneous by any means. Therefore, producers, retailers and other major players in the organic industry may focus their marketing strategies on the origin of the organic products to differentiate them and target specific consumer segments.

This study also aimed to explain the variability in WTP for organic fresh fruit and vegetables, by studying the link between price premiums and the origin of the product, as well as the producer's collective reputation, which is determined by the producer efforts to supply high quality products. WTP estimates were used for assessing an application of the model of collective reputation for organic and conventional apples from the state of Washington and Argentina. The preliminary results showed that the threshold cost and share values were also higher for the state of Washington, suggesting that consumers perceived a higher share of producers following organic practices in the state of Washington compared to those in Argentina. The findings from the survey combined with some estimates of productions costs do not contradict our hypothesis that posits a negative relationship between the WTP for organic and costs. Thus, the premium for organics might depend on the origin of the product and the producers' reputation.

Consumer perceptions play a determinant role in product choices. Along with other factors, producers may also affect the consumer perceptions by building reputation. In this study, reputation was measured by the producer's effort to supply high quality products, and according to the results, locally grown produce are perceived as having the highest reputation among produce from different origins. However, consumers may exhibit stronger preferences towards foods produced by firms with national reputation if the local producers fail to establish trust with their customers and build a reputation for supplying high quality products. While future research would be needed to test our hypothesis using complete cost data, our findings may offer guidance to organic producers and retailers in making decisions regarding the design of marketing, production, inspection, and procurement strategies.

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Table 1. Demographic characteristics of the sample

Characteristic	U.S. Population[1]	Survey Respondents	
	% Frequency	*n*	*% Frequency*
Gender			
Male	49.2	32	13.7
Female	50.8	202	86.3
Age			
24 and under	10.6	24	10.3
25 - 34	14.4	42	17.9
35 - 44	15.3	54	23.1
45 - 54	15.6	49	20.9
55 - 64	11.6	37	15.8
65 and older	13.5	28	12.0
Race and Ethnicity			
White	74.1	184	78.6
Black or African American	12.4	27	11.5
American Indian/ Alaska Native	0.8	0	0.0
Asian	4.3	5	2.1
Native Hawaiian/ Pacific Islander	0.1	0	0.0
Other	6.2	2	0.9
Two or more races	2.1	1	0.4
Hispanic (of any race)	14.7	15	6.4
Education			
Elementary school (through 8th grade)	6.5	0	0.0
Secondary school (9th through 11th grade)	9.5	2	0.9
High school or equivalent	30.0	26	11.1
Some college or associate degree	27.0	87	37.2
Bachelor's degree	17.1	75	32.1
Graduate or professional degree	9.9	44	18.8
Household Income			
Less than $10,000	7.6	15	6.4
$10,000 - $24,999	16.9	38	16.2
$25,000 - $49,999	25.6	75	32.1
$50,000 - $74,999	18.8	57	24.4
$75,000 - $99,999	12.1	25	10.7
$100,000 - $200,000	15.3	24	10.3
More than $200,000	3.7	0	0.0

[1] Data from the U.S. Census Bureau. 2007.

Table 2. Average ratings for fresh fruit and vegetables attributes

Variable	Mean	Std. Deviation
Freshness	4.684 [a]	0.799
Taste	4.684 [a]	0.701
Appearance	4.368 [b]	0.977
Risk of food poisoning	4.291 [b,c]	1.187
Price	4.218 [c]	0.985
Pesticide use	3.846 [c]	1.216
Imported or produced in the U.S.	3.406 [d]	1.278
Location of origin within the U.S.	3.291 [d]	1.337
Where it is sold	3.286 [d]	1.229
Certified Organic	2.872	1.277

Note: 1=Not at all important, 2=Slightly important, 3=Moderately important, 4=Very important, 5=Extremely important.

[a,b,c,d] Not significantly different at 5% level

Table 3. Average ratings for organically grown fresh fruit and vegetables attributes

Variable	Mean	Std. Deviation
Taste	4.167 [a]	1.403
Nutritious	3.966 [a]	1.453
Minimal chemical use	3.692	1.462
No genetically modified organisms	3.350 [b]	1.487
Environment-friendly	3.325 [b]	1.373
Supporting viable farming operations	3.274 [b]	1.415
Promotion of social justice	2.684	1.384

Note: 1=Not at all important, 2=Slightly important, 3=Moderately important, 4=Very important, 5=Extremely important.

[a,b] Not significantly different at 5% level

Table 4. Average ratings for the origin attributes of organic fresh fruit and vegetables

Variable	Mean	Std. Deviation
Supporting the farming community	3.496 [a]	1.421
Reputation of the location regarding its products	3.376 [a]	1.403
Improvement in environmental quality	3.269 [a,b]	1.393
The amount of fuel needed in reaching you	3.064 [b]	1.333

Note: 1=Not at all important, 2=Slightly important, 3=Moderately important, 4=Very important, 5=Extremely important.

[a,b] Not significantly different at 5% level

Table 5. Average ratings for attributes of farms where organic fresh fruit and vegetables are grown

Variable	Mean	Std. Deviation
Follows environment-friendly farming practices	3.483 [a]	1.424
Is officially certified organic	3.423 [a]	1.395
Treats on-farm labor fairly	3.389 [a]	1.456
Is located in the U.S.	3.385 [a]	1.437
It is a family farm	2.944	1.368
Personally knowing the farmer(s)	2.244	1.398

Note: 1=Not at all important, 2=Slightly important, 3=Moderately important, 4=Very important, 5=Extremely important.

[a] Not significantly different at 5% level

Table 6. Average ratings of the overall quality perceptions for fresh fruit and vegetables origins

Variable	Mean	Std. Deviation
Locally-grown	4.410 [a]	0.771
Grown in your region	4.261 [a]	0.789
U.S. grown	3.991	0.860
Imported from South America	3.230 [b]	1.072
Imported from Australia	3.000 [b,c]	1.168
Imported from Europe	2.893 [c]	1.106
Imported from China	2.378	1.205

Note: 1=Poor, 2=Somewhat poor, 3=Average, 4=Somewhat high, 5=High.

[a,b,c] Not significantly different at 5% level

Table 7. Average ratings of locally grown vs. imported organic attributes for fresh fruit and vegetables

Variable	n	Mean	Std. Deviation
Freshness	195	4.036	1.012
Safety	165	3.824 [a]	1.012
Flavor	188	3.819 [a]	0.975
Environmental impact	166	3.807 [a]	1.003
Nutrition	174	3.713 [a,b]	0.911
Appearance	187	3.658 [a,b]	0.956
Availability	188	3.612 [b]	1.086

Note: 1=Definitely Inferior, 2=Inferior 3=About the same, 4=Superior, 5=Definitely Superior.

[a,b] Not significantly different at 5% level

Table 8. Average rating of U.S. grown organic vs. imported organic attributes for fresh fruit and vegetables

Variable	**n**	**Mean**	**Std. Deviation**
Freshness	179	3.961 [a]	0.950
Environmental impact	163	3.816 [a]	1.020
Appearance	176	3.705 [b]	0.890
Safety	159	3.692 [b]	1.031
Flavor	168	3.655 [b]	0.966
Availability	175	3.617 [b]	1.021
Nutrition	162	3.611 [b]	0.973

Note: 1=Definitely Inferior, 2=Inferior 3=About the same, 4=Superior, 5=Definitely Superior.

[a,b] Not significantly different at 5% level

Table 9. Average rating of U.S. grown organic vs. locally grown attributes for fresh fruit and vegetables

Variable	**n**	**Mean**	**Std. Deviation**
Availability	183	3.120 [a]	0.888
Appearance	183	3.109 [a]	0.805
Nutrition	170	3.088 [a]	0.862
Safety	153	3.065 [a]	0.971
Flavor	180	3.039 [a]	0.874
Environmental impact	166	2.994 [a]	0.975
Freshness	187	2.925	0.975

Note: 1=Definitely Inferior, 2=Inferior 3=About the same, 4=Superior, 5=Definitely Superior.

[a] Not significantly different at 5% level

Table 10. Results of the conditional logit model

Variables	Coefficient		WTP		WTP (% from the base)
P	-2.264	*			
	(0.167)				
NATU	-0.153	***	-0.068		-1.654
	(0.093)		(0.041)		
INDEP	-0.106		-0.047		-1.145
	(0.094)		(0.041)		
ORG	0.343	*	0.151	*	3.700
	(0.069)		(0.033)		
LOC	9.839	*	0.253	*	6.189
	(0.612)		(0.049)		
REG	9.611	*	0.153	*	3.728
	(0.597)		(0.048)		
US	9.266	*	4.093	*	
	(0.597)		(0.076)		
CHI	8.499	*	-0.339	*	-8.276
	(0.578)		(0.052)		
SM	0.190	*	0.084	*	2.048
	(0.070)		(0.031)		
No. of observations					1,404
Log-likelihood ratio					925.46
McFadden's (1974) log-likelihood ratio index					0.3

*, **, *** Represent 1%, 5% and 10% significance level, respectively

Table 11. Preliminary model results

	Argentina	Washington
Production cost $/pound		
Conventional	0.07	0.16
Organic	0.12	0.29
Average % change	0.65	0.82
Variables		
H	3.89	3.89
L	3.15	3.15
χ	0.98	0.98
λ	0.90	0.90
δ	0.95	0.95
Preliminary calculations		
$\hat{c}$ (cost \$/3 lb bag)	3.29	3.30
Share	0.95	0.98

Figure 1. Choice experiment example

	Option A	**Option B**	**Option C**
			
Storefront	Mass-Market Supermarket	Independent Food Store	
Production process		Certified Organic	
Location of origin	Regional	National	None
Size of originating orchard	Small Farm	Large Farm	
Price / 3 lb	$ 3.79	$ 3.19	

Figure 2. Consumer's perception of local and regional products