

## Country-of-Origin Labeling of Beef Products: U.S. Consumers' Perceptions

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## **Country-of-Origin Labeling of Beef Products: U.S. Consumers' Perceptions**

### **Abstract**

In 2002, consumers in Chicago and Denver were surveyed and participated in an experimental auction to elicit their willingness-to-pay for country-of-origin labeling (COOL) of beef. Survey results indicate that the majority of consumers (73%) were willing to pay an 11% and 24% premium for COOL of steak and hamburger, respectively. In the auction, consumers were willing to pay a 19% premium for steak labeled “Guaranteed USA: Born and Raised in the US.” Food safety concerns, a preference for labeling source and origin information, a strong desire to support U.S. producers, and beliefs that U.S. beef was of higher quality, were the most common reasons consumers preferred COOL.

## **Country-of-Origin Labeling of Beef Products: U.S. Consumers' Perceptions**

### **Introduction**

Consumers are becoming increasingly concerned with the quality, safety and production attributes of their food (Caswell, 1998). Consumers' concern with the safety and origin of beef is especially true in light of the recent European and Japanese BSE outbreaks and occurrences of *E-coli* 0157:H7 in U.S. beef. The origin and processes used to produce beef products are not apparent to the consumer through experience, consumption, or visual inspection of the product. Therefore, without additional information, consumers are not able to differentiate the origin or processes used to produce the beef products they purchase in the retail store. Production attributes that may be valued by consumers, such as organic, non-GMO, and country-of-origin are considered to be credence characteristics (Darby and Karni, 1973, Caswell and Mojduszka, 1996). Truthful labeling of credence characteristics allows the consumer to judge the product before purchasing (Caswell, 1998).

Given that country-of-origin of beef is primarily a credence attribute, consumer advocacy groups and producer groups such as the National Cattlemen's Beef Association have petitioned for a mandatory country-of-origin labeling (COOL) law in the United States. In recent years, several bills mandating COOL of produce and meat products have been introduced and have failed to pass in Congress (Schupp and Gillespie, 2001b). Interestingly, however, after being debated for many years, a mandatory COOL program was passed as Title X, Section 10816 of the Farm Security and Rural Investment Act of 2002 (2002 Farm Bill). The 2002 program amends the Agricultural Marketing Act of 1946 and requires retailers to inform consumers of the

country-of-origin of ground meat and muscle cuts from beef, lamb and pork.<sup>1</sup> For a beef product to be labeled with as a “USA product,” the beef animal must be born, raised and processed in the United States. Initially, COOL will be a voluntary and will not become a mandatory program until 2004. (Farm Bill Conference Framework, 2002).

Proponents of mandatory COOL have expressed concerns about the safety of imported food, and have argued that “consumers have a right to know” where their food is coming from (Food Marketing Institute, 2002). Additionally, supporters of mandatory labeling believe that COOL would provide U.S. producers with a competitive advantage in the supermarket (Schupp and Gillespie, 2001b). Opponents of the law have argued that the costs incurred by producers, importers, packers, wholesalers and retailers to segregate and preserve the identity of meat products, as well as the government expenditures that would be necessary to insure compliance would be too high and would outweigh the benefits of the label (USDA-FSIS, 2000; Loureiro and Umberger, 2003). The Food Marketing Institute (2002) estimated that mandatory COOL would cost consumers and taxpayers \$1.3 billion annually. Other critics have argued that mandatory COOL would impose a trade barrier and fuel trade wars (Schupp and Gillespie, 2001a; Food Marketing Institute, 2002).

Aside from the COOL debate, Caswell and Padberg (1992) contend in their analysis of the role of labeling information in consumer good markets, that food labels provide more than just “point-of-purchase” information. In today’s modern food markets, information provided through required labeling disclosures “... may change the attitude of the consumers or consumers advocate (even if the consumers do not read or understand it) and may change the

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<sup>1</sup> Other commodities included in the mandatory COOL were farm-raised fish and shellfish, wild fish and shellfish, peanuts and fresh fruits and vegetables (Farm Bill Conference Framework, 2002).

sellers' strategy (Caswell and Padberg, 1992 p. 466).” Furthermore, because of the potentially broad impact that food labels can have on consumers' confidence in food quality, their education on diet and health, and their overall behavior, policy makers must take into account the benefits and costs of labeling policies, and evaluate how alternative methods impact consumers' behavior and sellers' strategy (Caswell and Padberg, 1992).

Caswell (1998) discusses the regulatory choices available for food labeling. Firms will voluntarily label a food product attribute if the private benefits from doing so exceed the costs (Caswell and Mojduszka, 1996). Consumers' express their market demand for a food attribute as well as their perceived benefits of the attribute through their willingness-to-pay (WTP) for higher levels of the attribute. Thus, the extent of government intervention that is necessary for food labeling and the social outcome from government intervention is dependent upon the information asymmetry in a market. In the past, government involvement in the regulation of food labels has served four primary purposes: to regulate competition, to allow consumers access to otherwise costly information, to reduce food safety risks, and to achieve a social goal (Hadden, 1986 and Golan et al. 2000). Labeling policies should enhance the information available to consumers, and as a result, improve the efficiency of the market (Caswell, 1998). A mandatory COOL would be an appropriate policy tool if the following conditions exist: there is asymmetric information, country-of-origin increases demand for the product, and the disclosure of possible negative quality attributes does not exceed the benefits (Golan et al., 2000).

Labeling of COOL may be beneficial in that it would transform country-of-origin attributes into search characteristics. However, the impact COOL will have on beef demand is unknown. Furthermore, the estimated costs of a mandatory COOL are large, and it is not yet known which sectors of the industry will ultimately bear the costs of mandatory COOL. Thus,

an important question is whether consumers prefer a product guaranteed to be born, raised and processed in United States; and whether they are they willing to pay more for a product with a country-of-origin label. The objective of this research is to quantitatively and qualitatively evaluate U.S. consumers' preferences and willingness-to-pay for country-of-origin labeling of beef products and steaks with a "USA Guaranteed: Born and Raised in the U.S.A." label. Surveys and experimental auctions are used to elicit consumers' preferences and willingness-to-pay (WTP) for COOL. Prior to discussing the results of this particular research, previous research studying examining similar labeling issues will be discussed.

### **Labeling of Credence Attributes in Food**

Numerous studies have examined consumers' preferences and WTP for various credence attributes associated with the processes used to produce foods, such as organic, eco-friendly, no use of growth hormones, non-genetically-modified, and shade-grown. The results of these studies have varied, but the general consensus has been that certain segments of the population are willing to pay more for the food products carrying a label identifying specific credence attributes (Loureiro, McCluskey and Mittelhammer, 2001; Lusk and Fox, 2002; Baker and Burnham, 2001.) Most of the previous work on the labeling of credence attributes in food has focused on production processes or food safety attributes that consumers may be concerned about. However, as mentioned earlier, consumers are becoming increasingly concerned about the origin of their food. The remainder of this section focuses on studies that have examined consumers' perceptions and preferences for country-of-origin labels on food products.

In 1999, Louisiana consumers, meat processors, wholesalers, retailers and restaurants were surveyed to determine their attitudes toward mandatory labeling of country-of-origin labeling of beef (Schupp and Gillespie, 2001a and Schupp and Gillespie, 2001b). The majority

of the Louisiana consumers surveyed, 93%, supported mandatory labeling of fresh and frozen beef in retail stores. Most of the consumers (86%) also rated U.S beef superior to imported beef based on their expectations of higher quality, and concerns with the safety of imported beef (Schupp and Gillespie, 2001a). The majority of the meat handlers (82%) surveyed by Schupp and Gillespie (2001b) supported mandatory COOL of beef as well. Beef handlers were more likely to favor the labeling requirement if they believed that their customers would benefit from the increased information provided by COOL. However, restaurants and firms that were already utilizing imported beef were less likely to support a mandatory COOL. The Schupp and Gillespie study indicates that consumers would be supportive of mandatory COOL of beef; however, they did not determine if consumers would be willing to pay a premium to cover the potential costs of mandatory COOL.

Several recent studies have examined international consumers' WTP for labels verifying the source of origin. Quagraine, Unterschultz and Veeman surveyed consumers in western Canada and found that fresh beef products originating from Alberta were preferred to products originating from other locations in Canada or the United States. Consumers in France, Germany, and the United Kingdom were surveyed in 2000 by Roosen, Lusk and Fox (2003) to determine European consumers' preferences for beef labeling strategies associated with origin-labeling, private brands, and mandatory labeling of beef from cattle fed genetically modified corn. Consumers in France and Germany indicated that the origin of their beef was more important than any other product attributes such as brand, price, marbling, or fat content. In the UK, however, consumers ranked origin labeling as more important than brand labeling, but steak color, price and fat content were most important (Roosen, Lusk and Fox, 2003).

Another European consumer study examined Spanish consumers' preferences and WTP for beef labeled from a specific geographical location (Loureiro and McCluskey, 2000). On average, consumers were willing to pay a premium for veal products with a specific Protected Geographical Identification (PGI) label called "Galician Veal. Loureiro and McCluskey (2000) observed that the PGI label played a larger role in determining the prices of higher quality and higher priced beef cuts, such as steaks, that are already perceived to have high intrinsic value.

In order to assess if U.S. consumers were WTP for a mandatory COOL program, Loureiro and Umberger (2003) surveyed 243 Colorado consumers during spring 2002. They found that that on average, Colorado consumers were willing to pay approximately \$184 per year for a mandatory COOL program. The same consumers indicated that they would be willing to pay an average of 38% and 58% more for "U.S. Certified Steak" and "U.S. Certified Hamburger," respectively.

One aspect related to COOL is traceability. A system allowing the product to be traced back to the producer is necessary in order to verify the source of origin of a product or production related credence characteristics. A recent study by Dickinson and Bailey (2002) evaluated consumers' preferences for beef and pork products that were guaranteed to be traceable to the farm level or animal of origin, as well as several other credence attributes: humane animal treatment, no added growth hormones, and food safety assurance. Dickinson and Bailey (2002) found that consumers were willing to pay more for food safety assurance than traceability, a guarantee of humane animal treatment, or no growth hormones. Although consumers valued and were willing to pay for traceability, they placed a higher value on the other three credence attributes and combinations of the attributes that were verifiable through the trace-back system.

The recently passed mandatory COOL law has increased the demand for information regarding U.S. consumers' perceptions and willingness to pay for COOL, and specifically for products with a U.S. label. The present research expands on previous studies by examining consumers in two regions of the United States and assessing consumers' perceptions and WTP for COOL after visually examining an actual steak product with a "USA Guaranteed: Born and Raised in the U.S. label."

### **Procedures, Data and Methods**

In June and July of 2002, consumers from Denver and Chicago were randomly screened and selected over the phone to participate in a study on beef quality. Qualifying individuals were told they would have the opportunity to taste and to purchase New York Strip beef steaks, and would be paid \$50 for two hours of their time. Individuals agreeing to participate were scheduled for one of 12 panels in each city. Twelve, two-hour panels were scheduled in each city and the time of day of the sessions ranged from 9 a.m. to 7 p.m.

Upon arriving at the designated research facility, consumers were paid the \$50 promised to them over the phone and were asked to complete surveys describing their meat-purchasing behavior, eating preferences, knowledge of beef and socio-demographic characteristics. Additionally they were asked to indicate their preference and willingness-to-pay for different beef products with labels identifying the country-of-origin where the beef was produced.

After completing the survey questions, the unique random  $n$ th price auction (Shogren et al., 1994) was explained to consumers. The research monitor read a dialogue to participants explaining that they would have the opportunity to bid on steaks in several auctions and that their bids would determine the price paid for the steaks in the auctions. They were told that for each auction there would be either one, two, or three winning bids, and that the winner(s) would pay

the second, third, or fourth highest bid price, respectively. The determination of which auctions were second, third, or fourth-price auctions would be a random draw out of a hat. Panelists would be informed of the market price, the second, third, or fourth-highest price, and they could determine if they had won the auction if their bid exceeded the market price. However, they would not know how many winners there were or who the other winners were. Furthermore, they were informed that only some of the auctions would be binding and they would not know which auctions were binding until the end of the series of auctions. Participants were encouraged to bid exactly what they believed the product to be worth to them. They were told that they were not required to submit a bid, but if they chose not to bid, they were asked to state their reasons on the bid sheet.

This random  $n$ th price auction (Shogren et al, 1994; and Shogren et al., 2001) was used in order to elicit consumers' true valuation of the country-of-origin labeled versus unlabeled steaks. The WTP mechanism induced by an auction is less hypothetical than contingent valuation methods (Fox et al., 1995) and the use of an  $n$ th price auction is well-established in the literature on WTP. Various versions of the  $n$ th price auction have been used to elicit consumers' WTP for a variety of food products and attributes (see for example Fox et al (1994), Hayes et al. (1995), Melton et al.(1996), Umberger et al. (2002) and Dickinson and Bailey (2002))

After the auction was explained, consumers were asked to visually evaluate two New York Strip steaks in overwrapped Styrofoam packages. The steaks were cut from the same strip loin so as to be nearly identical in size, color, marbling and external fat. Therefore, the major difference between the two steaks was that one package had a label stating "USA Guaranteed: Born and Raised in the U.S.A." and the other package had no label. Consumers were then given the opportunity to submit a sealed-bid in dollars per pound for each steak package. After all of

the bids were collected, the moderators ranked the bids and drew a number from the cup determining the market price for each auction and the binding auction (either the labeled or unlabeled steak auction). Consumers were then moved into taste panel booths to complete another set of auctions for the taste preference portion of the study.<sup>2</sup>

### *Modeling Consumers Preferences*

An objective of this study was to determine the factors influencing consumers' preferences and willingness-to-pay for "USA Guaranteed" country-of-origin labels on steak. The consumer's preference and WTP for the U.S. labeled product is based on Lancaster's (1973) theory of consumer demand. Lancaster theorized that consumers attempt to maximize their utility by choosing a product with attributes that will provide them with the highest amount of utility. We measure consumers' utility for U.S. country-of-origin labeling through their WTP for a "USA Guaranteed" labeled steak, and an unlabeled steak. Consumers' WTP for the "USA Guaranteed" steak and the unlabeled steak was measured through the bids elicited in the random  $n$ th price auction.

Let consumer  $i$ 's willingness-to-pay, measured through their auction bid for the "USA Guaranteed" steak, be equal to  $WTP_{ij}$ ; and their willingness-to-pay for the unlabeled steak be equal to  $WTP_{ik}$ . In order to measure the probability a consumer would be willing-to-pay for the "USA Guaranteed" steak the difference between  $WTP_{ij}$  and  $WTP_{ik}$  was calculated. The bid difference for each consumer was then divided by the bid for the unlabeled steak,  $WTP_{ik}$ , to calculate consumer  $i$ 's premium for the U.S. labeled steak. If a consumer's premium was larger

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<sup>2</sup> The results presented in this paper are part of a larger study on consumer taste preferences for beef quality attributes. A more in-depth explanation of the experimental methods and processes and the results of the taste preference study can be found in Sitz, 2003.

than 10%, the consumer was considered to have a strong preference for a steak product labeled as “USA Guaranteed: Born and Raised in the USA,” and  $USAPREF_i$  is equal to 1.  $USAPREF_i$  is equal to 0 if a consumer’s premium was less than 10% or was negative, indicating he or she did not have a strong preference for the labeled steak. Therefore,  $USAPREF_i$  is represented by the following equation:

$$(1) \quad USAPREF_i = X_i' \beta + \varepsilon_i.$$

Where  $USAPREF_i$  is as defined earlier,  $X_i'$  is a vector of explanatory variables (including a constant) that may influence a consumer’s WTP for the “USA Guaranteed” steak,  $\beta$  is the vector of coefficients, and  $\varepsilon_i$  is an error term (Greene, 1998). Given that  $USAPREF_i$  can equal either 0 or 1, a binomial logit model is used to specify the relationship between sociodemographic variables, product characteristics, and a consumer’s likelihood of preferring and being willing to pay a substantial premium for a “U.S. guaranteed” steak. The logistic probability distribution is assumed, and defined as (Greene, 1998):

$$(2) \quad \text{Prob}(USAPREF = 1) = \frac{e^{(X_i' \beta)}}{1 + e^{(X_i' \beta)}}.$$

The following equation was used to empirically model the probability that a consumer would prefer and be willing to pay a premium for a U.S. labeled steak:

$$(3) \quad \begin{aligned} USAPREF_i = & \beta_0 + \beta_1 Location_i + \beta_2 Age_i + \beta_3 Gender_i + \beta_4 Ethnic_i + \beta_5 Kids_i \\ & + \beta_6 Income_i + \beta_7 Educate_i + \beta_8 Safety_i + \beta_9 Source_i + \beta_{10} COOL_i + \beta_{11} Local_i \\ & + \beta_{12} Fresh_i + \beta_{13} Organic_i + \beta_{14} BeefEat_i + \beta_{15} NonGrocery_i + \beta_{16} USDAGRADE_i + \varepsilon_i. \end{aligned}$$

$USAPREF_i$  is the binary variable (explained previously) indicating the consumer’s preference for the U.S. labeled steak versus the unlabeled steak.  $Location$  is a dummy variable equal to 0 if the location was Denver and equal to 1 if the location was Chicago.  $Age$  is the age level of the

respondent, *Gender* is a dummy variable indicating the respondent was a male, *Ethnic* is a dummy variable equal to 0 if the respondent was Caucasian and 1 otherwise, *Kids* is a dummy variable indicating that there are children present in the household, *Income* is the participant's household income level, and *Educate* is the level of education the respondent completed. *Safety*, *Source*, *COOL*, *Local*, *Fresh* and *Organic* are dummy variables indicating that food safety, source assurance, country-of-origin, locally produced, fresh and organic are extremely desirable attributes in a consumer's shopping decision, respectively (Table 2). *Beefeat* is a dummy variable equal to 1 if beef is the meat product most commonly consumed in the household. *NonGrocery* is a dummy variable indicating that the consumer typically purchases meat somewhere other than a retail store or warehouse outlet. *USDAGrade* is equal to 1 if the consumer typically purchases USDA Choice or Select beef and 0 otherwise; and  $\varepsilon_i$  is the random error term. The coding, means and frequencies of the independent variables associated with demographics and consumption preferences are further explained in Tables 1 and 2.

## **Results**

### *Consumer Demographics and Shopping Behavior*

In total, 273 consumers participated in the study. Slightly more consumers participated in Chicago (141 consumers) than in Denver (132 consumers). The majority of the participants were females (73%) and Caucasian (87%). On average, participants were about 40 years of age, were married, had two children under the age of 18 living in their household, and had some college experience. The mean household income level of the sample was calculated to be between \$50,000 to \$60,000 and most participants (74%) were employed either full or part time. Beef and chicken were the primary meat products purchased and consumed, with the majority of the consumers (70%) indicating that they preferred to consume beef. USDA Select was marked

as the grade of steaks most often purchased at home; but, more than one-third of the participants were not able to identify the grade of beef they most commonly purchased. On average, quality (50%) was the primary factor determining consumers' meat-purchasing decisions; however, nearly 45% of the consumers indicated that price or budget drove was the major driver of their shopping decisions. Demographic and summary statistics are provided in Table 1.

Consumers were asked to rank the importance of a series of food characteristics that are important to them when purchasing beef. The average rankings of the beef attributes that were ranked as most desirable to consumers are shown in Table 2. Freshness, food safety inspection, color, price and leanness were the five attributes ranked highest by consumers on a Likert scale. The attributes indicating production location or source of origin of the beef, such as country-of-origin, beef raised locally, and source assurance, were less important to consumers; however, they were still ranked as "very" to "somewhat desirable." The relatively high ratings for freshness and food safety inspection are similar to those found by Loureiro and Umberger (2003) in their study of Colorado consumers.

#### *Preferences and Willingness to Pay for COOL*

Consumers' preferences and WTP for COOL were elicited through both a survey and an auction. In the survey, consumers were first asked to indicate their preference between purchasing a steak with a label identifying the country of origin where the beef product was produced versus a beef product without a label. The majority of the consumers, 75% indicated that they preferred to purchase the labeled product, 22% were indifferent, and 3% preferred to purchase the unlabeled product. Consumers indicating a preference for the country-of-origin labeled product were asked to explain why they preferred the label. Participants' reasons for choosing the labeled product were grouped into five categories: safety and health of meat,

freshness of meat, quality of meat, support of producers, location, and general information. Selected comments from consumers and the percent of consumers identifying each characteristic as the basis for their preference for a COOL are shown in Table 3. Food safety concerns about imported beef, a preference for labels and more information about the source and origin of products, a strong desire to support U.S. producers, and beliefs that U.S. beef was of higher quality were the most commonly cited rationale for preferring a label identifying the country-of-origin of beef products (Table 3). Consumers' motivations for preferring the labeled product are similar to those specified by the Schupp and Gillespie (2001a) and the USDA-FSIS (2000).

After signifying their preferences for country-of-origin labeling of beef, consumers were asked to indicate the most they would be willing to pay per pound for a country-of-origin labeled beef steak, in addition to a typical \$4.00 per pound steak price. Participants were given the choice of selecting premiums ranging from no premium to \$1.25 per pound premium. They also were given the option to provide their own premium. In addition, they were asked to complete the same WTP question for hamburger priced initially at \$1.50 per pound. Based on the survey results, the majority (73%) of the consumers were willing to pay a premium for COOL (Table 4). However, 26% were not willing to pay a premium for COOL, regardless of whether or not they indicated a preference for COOL.

On average, consumers were willing to pay a \$0.42/lb or an 11% premium for COOL of steak (Table 4). Although the difference is insignificant, Denver consumers were willing to pay a larger premium than Chicago consumers for COOL of steak. Consumers were willing to pay more for COOL of hamburger than for COOL of steak. The average premium for country-of-origin labeled hamburger was \$0.36/lb (24% premium). These COOL premiums are smaller than the premiums estimated by Loureiro and Umberger (2003) in their WTP study on U.S.

COOL. This difference may be due to the particular survey design or the fact that Loureiro and Umberger (2003) designated the country-of-origin as “U.S. certified,” whereas in this portion of the study, the specific country was not specified. However, they also found WTP for COOL of hamburger to be substantially higher than WTP for COOL of steak.

The final section in the survey on meat preferences and WTP asked consumers to rank the beef product (steak, hamburger/ground beef, roasts, or processed beef products) that they would most prefer to have labeled with the country-of-origin. On average, consumers ranked hamburger and steak as the beef products they would most prefer to have labeled with country-of-origin. The importance of labeling these products was significantly higher than labeling beef roasts or processed beef products. These results maybe due to the fact that steaks and ground beef are the two beef products most commonly consumed at home by research participants (Table 1).

### *Experimental Results*

After completing the survey, consumers participated in a random  $n$ th price auction for two steaks in overwrapped Styrofoam packages. The packaging and presentation of the steaks were similar to how steak is typically presented in the supermarket; however, one steak carried a label stating “USA. Guaranteed: Born and Raised in the United States” and the other steak carried no label. Consumers were given an opportunity to visually evaluate the steaks and were then asked to submit their bids in dollars per pound for each steak. After having the opportunity to visually evaluate the “U.S. Guaranteed” labeled and the non-labeled steaks, 69% of the participants bid more, and were willing to pay a premium for the U.S. labeled steak; however, approximately 7% of the consumers preferred and bid more for the non-labeled steak, and 24% of the consumers were indifferent between the two steaks.

The average auction prices that consumers bid for the labeled and unlabeled steaks are presented in Table 5. On average, consumers were willing to pay \$0.81 per pound more for the “USA Guaranteed” labeled steak over the non-labeled steak. This difference translates into an average premium of approximately 19% for the U.S. country-of-origin labeled steak. Consumers in Chicago were willing to pay a significantly higher premium of 23% for the labeled steak than the Denver participants who were only willing to pay a 14% premium for the U.S. labeled steak. The steak premiums from the auction are of greater magnitude than those elicited through the survey methods. This may be due to the anchoring effect from providing consumers with bids to evaluate rather than asking them to indicate their own bids. Furthermore, the fact that consumers were actually able to see the product that they were bidding on may have increased their overall WTP.

The distributions of the premiums that consumers were willing to pay for the U.S. labeled steak are shown in Figure 1. The percent premium category labeled as “0% premium” includes both consumers who were indifferent between the labeled and non-labeled product and those consumers who preferred the non-labeled steak; thus, this category accounts for 31% of the consumers. Over one half (56%) of the participants were willing to pay a premium larger than 10%, and about one-third (30%) of the participants were willing to pay a premium ranging between 10 to 25%. A small number of the consumers, 10%, were willing to pay a premium of more than 50%.

The results of the estimated binomial logit model (equation 3) are presented in Table 6. The marginal effects represent the change in the probability that a consumer is willing to pay more than 10% for the steak labeled as “USA. Guaranteed” when the independent variable changes by one unit. The logit model estimated 68% of the individual choices correctly and is

significant at  $\alpha = 0.01$ . Additionally, the coefficients and marginal effects all carry the expected sign, except for the *Income* and *Organic* variables. The initial hypotheses were that higher income levels, and an indication by the consumer that organically or naturally produced food is extremely desirable, would increase the participant's probability of paying a premium for a U.S. labeled product.

The negative sign on the coefficient and marginal effect of *Income* is similar to that found by Loureiro and Umberger (2003) in their study of consumers' WTP for U.S. country of origin labeling. Loureiro and Umberger explain a plausible reason for the negative marginal income effect may be that wealthier consumers already believe that their meat supply is safe and are less concerned about the country-of-origin of their beef products. This reverse effect may also be true for consumers who indicated that an organic or natural label was an important attribute; consumers who purchase organic or natural beef may already believe their beef supply is safe. However, the coefficient and marginal effects for *Organic* were not significant.

The variables *COOL*, *Local*, and *NonGrocery* were all significant at the  $\alpha = 0.05$  level and carry the expected sign. The significance of the *COOL* and *Local* variables indicate that consumers that find a label guaranteeing the country of origin of their beef products, and that the beef product was raised in their region of the country are 19% and 15% more likely to pay a premium for the U.S. labeled product. Additionally consumers who do not usually purchase their meat at the supermarket, but rather tend to purchase it from a butcher shop, private meat market, whole food store or directly from the producer are 27% more likely to be willing to pay a premium for the U.S. labeled steak. The *Source* and *Fresh* variables were significant at the  $\alpha = 0.10$  level. Consumers who indicated that source assurance (knowing who produced the beef) and freshness were extremely desirable were 15% and 31% more likely to pay a premium

for the U.S. labeled product. The fact that *Source* and *Fresh* were significant variables is likely related to the consumers' beliefs that beef from the U.S. is fresher than beef from other countries (Table 3).

While the socio-demographic variables had the expected signs (other than *Income*), it was surprising that the variables *Gender* and *Kids* were not significant. Other studies examining consumers' WTP for labeled credence attributes have found that females and consumers with children under the age of 18 are more likely to pay for products labeled with credence attributes (Loureiro and Umberger, 2003 and Armah, 2002). The fact that the presence of children in the household did not significantly increase the probability of consumers' WTP for COOL may be due to the fact that the participants with children had a lower disposable household income.

### **Summary and Conclusions**

In 2002, 273 consumers in Chicago and Denver were surveyed and participated in an experimental auction to elicit their willingness-to-pay for country-of-origin labeling of beef. Seventy-five percent of the consumers preferred to purchase a beef product with COOL. The survey results indicate that the majority of consumers (73%) were willing to pay an 11% and 24% premium for COOL of steak and hamburger, respectively. However, 26% of the consumers were not WTP a premium for COOL of steak. The most commonly cited reasons by consumers for preferring COOL were: food safety concerns about imported beef, a preference for labeling source and origin information, a strong desire to support U.S. producers, and beliefs that U.S. beef was of higher quality.

In addition to the survey, consumers participated in an auction and bid on two steaks, one steak was labeled as "Guaranteed USA: Born and Raised in the United States" and the other steak carried no label. On average, consumers were willing to pay a 19% premium for the

“Guaranteed USA” steak. Chicago consumers were willing to pay significantly more for the U.S. labeled steak than Denver participants. The results of the logit analysis imply that consumers who find beef attributes such as freshness, source assurance, locally-raised, and country-of-origin labeled, as “extremely desirable” are more likely to be willing to pay for a steak labeled as “USA Guaranteed.” Moreover, wealthier consumers were less likely to prefer the labeled product; and consumers who typically purchased their beef directly from the producer or at a specialty meat market were more likely to prefer the “USA Guaranteed” steak.

A large percent of consumers appear to be willing to pay premium for COOL. Consumers who were willing to pay the most for the label believed the label signified increased food safety and quality. Therefore, retailers and processors labeling products with a country-of-origin label may also want to consider labeling food safety and quality attributes. Additional research is necessary to determine if the premiums are substantial enough to cover the additional costs associated with the certification and traceability programs necessary to validate the label.

## References

- Armah, P.W. 2002. "Setting Eco-Label Standards in the Fresh Organic Vegetable Market of Northeast Arkansas." *Journal of Food Distribution Research* 33(1): 35-45.
- Caswell, J.A. 1998. "How Labeling of Safety and Process Attributes Affects Markets for Food." *Agricultural and Resource Economics Review*. 27(October): 151-158.
- Caswell, J.A. and D.I. Padberg. 1992. "Toward a More Comprehensive Theory of Food Labels." *American Journal of Agricultural Economics* 74(May): 461-468.
- Caswell, J.A. and E.M. Mojduszda. 1996. "Using Informational Labeling to Influence the Market for Quality in Food Products." *American Journal of Agricultural Economics* 78(December): 1248-1253.
- Dickinson, D.L. and D. Bailey. 2002. "Meat Traceability: Are U.S. Consumers Willing to Pay for It?" *Journal of Agricultural and Resource Economics*. 27(2): 348-364.
- Darby, M.R. and E. Karni. 1973. "Free Competition and the Optimal amount of Fraud." *Journal of Law and Economics* 16(1): 67-68.
- Farm Bill Conference Framework. 2002. "Farm Bill Conference Summary" April 30, <http://www.senate.gov/~agriculture/Briefs/2001FarmBill/conframe.htm>. Accessed March 1, 2003.
- Food Marketing Institute. 2002. "Mandatory Country-of-Origin Labeling." *FMI Backgrounder* [http://www.fmi.org/media/bg/COOLabeling\\_02.pdf](http://www.fmi.org/media/bg/COOLabeling_02.pdf) Accessed December 24, 2002.
- Fox, J.A., D.J. Hayes, J.B. Kliebenstein, D.G. Olson, and J.F. Shogren. 1994. "Consumer Acceptability of Milk from Cows Treated with Bovine Somatotropin." *Journal of Dairy Science* 77: 703-707.
- Fox, J.A., J.F. Shogren, D.J. Hayes, and J.B. Kliebenstein. 1995. "Experimental Auctions to Measure Willingness to Pay for Food Safety." Chapter 6. *Valuing Food Safety and Nutrition*. Ed: J.A. Caswell, Boulder, CO. Westview Press.
- Golan, E., F. Kuchler, L. Mitchell, C. Greene, and A. Jessup. 2000. *Economics of Food Labeling*. Economic Research Service, U.S. Department of Agriculture. Agriculture Economic Report no. 793.
- Greene, W.H. 1998. *Limdep*. Version 7.0. Plainview, NY: Econometric Software, Inc.
- Hadden, S.G. 1986. *Read the Label: Reducing Risk by Providing Information*. Boulder, CO: Westview Press.
- Hayes, D.J., J.F. Shogren, S.Y. Shin, J.B. Kliebenstein. 1995. "Valuing Food Safety in

- Experimental Auction Markets.” *American Journal of Agricultural Economics*. 77(February): 40-53.
- Loureiro, M.L. and W.J. Umberger. 2003 “Estimating Consumer Willingness-to-Pay for Country-of-Origin Labeling.” *Journal of Agricultural and Resource Economics* Forthcoming.
- Loureiro, M.L. and J.J. McCluskey. 2000. “Assessing Consumer Response to Protected Geographical Identification Labeling.” *Agribusiness: An International Journal* 16(3) 309-320.
- Loureiro, M.L., J.J. McCluskey, and R.C. Mittelhammer. 2001. “Assessing Consumers Preferences for Organic, Eco-labeled and Regular Apples.” *Journal of Agricultural and Resource Economics* 26(2): 404-416.
- Lusk, J.L. and J.A. Fox. 2002. “Consumer Demand for Mandatory Labeling of Beef from Cattle Administered Growth Hormones or Fed Genetically Modified Corn.” *Journal of Agricultural and Applied Economics* 34(1): 27-38.
- Melton, B.E., W.E. Huffman, J.F. Shogren, and J.A. Fox. 1996. “Consumer Preferences for Fresh Food Items with Multiple Quality Attributes: Evidence from an Experimental Auction of Pork Chops.” *American Journal of Agricultural Economics* 78(November): 916-923.
- Quagraine, K., J. Unterschultz and M. Veeman. 1998. “Effects of Product Origin and Selected Demographics on Consumer Choice of Red Meats.” *Canadian Journal of Agricultural Economics*. 46: 201-219.
- Roosen, J., J.L Lusk and J.A. Fox. 2003. “Consumer Demand for and Attitudes Toward Alternative Beef Labeling Strategies in France, Germany, and the UK.” *Agribusiness: An International Journal* 19(1): 77-90.
- Sitz, B.M. 2003. “Consumer Sensory Acceptance and Value of Beef from Various Aging Techniques and Countries of Origin.” M.S. Thesis, University of Nebraska, Lincoln.
- Schupp, A. and J. Gillespie. 2001a. “Consumer Attitudes Toward Potential Country-of-Origin Labeling of Fresh or Frozen Beef.” *Journal of Food Distribution Research*. 33(November): 34-44.
- Schupp, A. and J. Gillespie. 2001b. “Handler Reactions to Potential Compulsory Country-of-Origin Labeling of Fresh or Frozen Beef.” *Journal of Agricultural and Applied Economics*. 33(): 161-171.
- Shogren, J.F., J.A. Fox, D.J. Hayes and J.B. Kliebenstein. 1994. “Bid Sensitivity and the Structure of the Vickrey Auction.” *American Journal of Agricultural Economics*. 76(December): 1089-1095.

Shogren, J.F., M Margolis, C. Koo, and J. List. 2001. "A Random  $n$ th Price Auction." *Journal of Economic Behavior and Organization* 46(December): 409-21.

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

USDA-FSIS, USDA Food Safety and Inspection Service, United States Department of Agriculture. Communications to Congress. "Mandatory Country of Origin Labeling of Imported and Fresh Muscle Cuts of Beef and Lamb." January 2000. pp. 1-39. <http://www.fsis.usda.gov/oa/congress/cool.htm>. Retrieved July 2002.

**Table 1. Definitions of Demographic Variables and Summary Statistics.**

<b>Variable</b>	<b>Description</b>	<b>Overall %</b>	<b>Mean (Std Dev.)</b>
Gender	0 = Female	72.9	0.27
	1 = Male	27.1	(0.45)
Location	0 = Denver	48.4	0.52
	1 = Chicago	51.6	(0.50)
Age	1 = 18 to 21 years	2.21	6.07
	2 = 22 to 24 years	2.57	(1.93)
	3 = 25 to 29 years	3.68	
	4 = 30 to 34 years	9.19	
	5 = 35 to 39 years	17.65	
	6 = 40 to 44 years	26.10	
	7 = 45 to 49 years	15.81	
	8 = 50 to 54 years	13.60	
	9 = 55 to 59 years	4.04	
	10 = Over 60 years	5.15	
Ethnic Background	0 = Caucasian	87.09	0.25
	1 = Other	12.91	(0.81)
Education Level	1 = Elementary school	0.00	4.85
	2 = Some high school	1.47	(1.36)
	3 = Completed high school	16.54	
	4 = Some college	30.51	
	5 = Completed junior college	9.24	
	6 = Completed a 4-year university	32.35	
	7 = Graduate school	9.93	
Employment Status	1 = Student	1.85	2.91
	2 = Part-time	28.52	(0.77)
	3 = Full-time	45.93	
	4 = Not employed	23.70	
Income	1 = Less than \$20,000	4.8	7.09
	2 = \$20,000 to \$24,999	2.72	(2.28)
	3 = \$25,000 to \$29,999	2.33	
	4 = \$30,000 to \$34,999	5.45	
	5 = \$35,000 to \$39,999	5.45	
	6 = \$40,000 to \$49,999	10.89	
	7 = \$50,000 to \$59,999	13.62	
	8 = \$60,000 to \$69,999	14.40	
	9 = \$70,000 or more	40.86	
Marital Status	1 = Single	15.07	3.43
	2 = Divorced	7.72	(1.20)
	3 = Separated	1.10	
	4 = Married	73.16	
	5 = Widowed	1.10	
	6 = Domestic Partnership	1.84	

**Table 1. Continued. Definitions of Demographic Variables and Summary Statistics.**

<b>Variable</b>	<b>Description</b>	<b>Overall %</b>	<b>Mean (Std Dev.)</b>
Children in Household	1 = Yes	63.00	1.37
	0 = No	37.00	(0.48)
No. of Children	1 = 1	28.99	2.12
	2 = 2	40.83	(1.00)
	3 = 3	23.67	
	4 = 4	3.55	
	5 = 5	1.78	
	6 = more than 5	1.18	
Preferred beef product to consume	1 = Beef	70.22	1.65
	2 = Pork	2.57	(1.10)
	3 = Chicken	22.79	
	4 = Lamb	0.74	
	5 = Fish	3.31	
	6 = Elk	0.37	
Meat product most consumed at home	1 = Beef	69.23	0.69
	0 = Pork	1.47	(0.46)
	0 = Chicken	25.64	
	0 = Lamb	0.00	
	0 = Fish	1.83	
	0 = Elk	0.37	
	0 = Shrimp	0.37	
	0 = Turkey	1.10	
Beef product most often purchased for consumption at home	1 = Steaks	36.6	1.75
	2 = Ground beef or hamburger	56.8	(0.83)
	3 = Roasts	5.1	
	4 = Other	1.5	
Grade of steaks purchased for household consumption	1 = USDA Choice	46.15	0.59
	1 = USDA Select	13.55	(0.49)
	0 = USDA Prime	0.73	
	0 = Don't know	35.9	
Primary factor in meat purchasing decisions	1 = Quality	50.37	0.50
	0 = Price	29.04	(0.50)
	0 = Budget	14.71	
	0 = Health	5.88	
	0 = Other	3.67	1.97
Place where typically purchase beef products	0 = Retail or warehouse store	90.46	0.12
	1 = Butcher shop or specialty health store	10.24	(0.33)
	1 = Private farmer or rancher	2.21	
Country-of-Origin Labeling Preference	1 = Labeled product	74.72	1.48
	2 = Unlabeled product	2.93	(0.84)
	3 = Do not care	22.35	

**Table 2. Mean Rank of the Importance of Beef Attributes to Consumers (Variables measured on a Likert Scale where 1 = Extremely Desirable and 5 = Not Desirable at all)**

<b>Attribute</b>	<b>Mean</b>	<b>Standard Deviation</b>
Freshness	1.23	0.52
Inspected for Food Safety	1.45	0.77
Color	1.60	0.72
Price	1.72	0.76
Leanness	1.76	0.78
High Quality Grade	1.79	0.77
Tender	1.86	0.85
Nutritional Value	2.20	0.92
Country-of-Origin Label	2.41	1.17
Marbling	2.43	1.04
Brand	2.53	0.98
Source Assurance	2.56	1.08
Environmentally Friendly Production Methods	2.61	1.05
Beef raised in your region of the country	2.64	1.09
Convenience	2.66	1.01
Fat Content	2.75	1.26
Organic/Natural	3.01	1.15

**Table 3. Participants' Rationale for Preferring Country-of-Origin Labeling (Selected Comments from Survey Responses).**

Category	Selected Comments	Percent <sup>a</sup>
Safety and Health of Meat	<ul style="list-style-type: none"> <li>• Food safety inspections, regulations and health standards are not as stringent outside of U.S.</li> <li>• Trust U.S. health standards</li> <li>• Mad cow disease in some countries</li> <li>• To know what I'm eating was produced somewhere clean and safe</li> <li>• Do not trust beef from outside of the United States</li> <li>• Safety- if I knew the meat came from reputable sources, I would worry less about getting bad meat.</li> <li>• For future information in case there was a health or safety problem involving the meat consumed</li> <li>• With the food safety controversy, I am more cautious than before label helps.</li> </ul>	45.0%
Freshness of Meat	<ul style="list-style-type: none"> <li>• U.S.A. meat is fresher</li> <li>• Believe label indicating a closer geographical region would be fresher meat</li> </ul>	4.5%
Quality of Meat	<ul style="list-style-type: none"> <li>• U.S. beef is higher quality</li> <li>• Label provides me with a better feeling of health and quality</li> <li>• U.S. has more quality control, stricter animal feed regulations and less chemical is used in processing</li> </ul>	11.0%
Support Producers	<ul style="list-style-type: none"> <li>• Want to support US farmers and ranchers, also don't want to buy beef raised in areas where rainforests are burned down</li> <li>• I want to support US farmers</li> <li>• I'd prefer to buy American (like my car) and support U.S. producers, I'd buy it over an unlabeled or other country item</li> <li>• I buy mostly organic meat, want to support a reputable organic farm</li> </ul>	21.0%
Location	<ul style="list-style-type: none"> <li>• I would prefer beef from the United States, Australia or Argentina.</li> <li>• Prefer meat from Colorado because familiar with quality.</li> <li>• I would like to know if I'm eating a steak from a Third World country- I don't think it would be quite as healthy.</li> <li>• If not produced in U.S.A. or Canada, I would have concerns about the safety.</li> <li>• I would be concerned if it was from England</li> <li>• Some countries have better reputation in beef industry (i.e. New Zealand Lamb)</li> <li>• Would like to learn about the company and country producing beef – where animals come from, their feeding and handling processes</li> </ul>	12.5%
General Information	<ul style="list-style-type: none"> <li>• More information is always desirable, it gives me confidence in the product</li> <li>• Label tells me about the way cattle were fed and raised.</li> <li>• I prefer anything labeled vs. unlabeled – (label) makes me feel like I had some decision in purchase selection.</li> <li>• If there's a recall it would be easier to identify where meat comes from.</li> <li>• I like labels when I go to a big grocery store, but when I go to a little store where there is a meat market, I don't care about labels because I know their meats are good.</li> <li>• Aware of the inspection and/or conditions in which the meat was processed.</li> <li>• Label allows me to feel more comfortable with the product.</li> </ul>	31.8%

<sup>a</sup> The percentages do not add up to 100% because some comments fit multiple categories.

**Table 4. Average Survey Premiums and Percent of Population Willing to Pay for Country-of-Origin Labeling of Steak and Hamburger**

	Steak			Hamburger		
	Premium <sup>a</sup> \$/lb	% Premium	% Population <sup>b</sup>	Premium <sup>c</sup> \$/lb	% Premium	% Population <sup>b</sup>
<b>Denver</b>	\$0.36	9.1%	83.0%	\$0.36	24.3%	81.1%
(Std Deviation)	(0.54)			(0.43)		
<b>Chicago</b>	\$0.48	12.0%	67.4%	\$0.36	24.3%	67.4%
(Std Deviation)	(0.63)			(0.39)		
<b>Overall</b>	\$0.42	10.5%	72.9%	\$0.36	24.3%	71.8%
(Std Deviation)	(0.59)			(0.41)		

<sup>a</sup>Premium is the most that a participant would be willing to pay per pound in addition to a \$4.00/lb steak price.

<sup>b</sup>Percent of the population that indicated they would be willing to pay a premium for country-of-origin labeling of steak or hamburger

<sup>c</sup>Premium is the most that a participant would be willing to pay per pound in addition to a \$1.50/lb hamburger price.

**Table 5. Average Auction Bids (\$/pound) and Bid Differences for “U.S. Guaranteed” and Non-Labeled Steaks (Standard Deviation in Parenthesis).**

<b>Treatment</b>	<b>Chicago Mean (Standard Deviation)</b>	<b>Denver Mean (Standard Deviation)</b>	<b>Overall Mean (Standard Deviation)</b>
“U.S. Guaranteed” Steak	\$5.56 (1.69)	\$4.69 <sup>a</sup> (1.61)	\$5.14 (1.71)
Non Labeled Steak	\$4.53 (2.15)	\$4.12 <sup>a</sup> (1.69)	\$4.33 (1.95)
Difference (U.S. Labeled vs. Non Labeled)	\$1.03 (1.67) <sup>b</sup> n = 141	\$0.57 (1.22) <sup>b</sup> n = 132	\$0.81 (1.49) <sup>b</sup> n = 273

<sup>a</sup> Mean bids are significantly different between locations (  $\alpha = 0.05$  )

<sup>b</sup> Mean bids are significantly different between treatments (  $\alpha = 0.05$  )

**Table 6. Logit Estimates and Marginal Effects for the Willingness to Pay for Steak Labeled with “U.S. Guaranteed.”**

	Logit Estimate		Marginal Probability	
	Coefficient	t-ratio	Coefficient	t-ratio
Constant	-0.20	-0.16	-0.05	-0.16
Location	-0.05	-0.16	-0.01	-0.16
Age	0.04	0.48	0.01	0.48
Gender	-0.14	-0.42	-0.03	-0.42
Ethnic	-0.34	-0.85	-0.08	-0.85
Kids	0.26	0.83	0.06	0.83
Income	-0.13*	-1.89	-0.03*	-1.89
Educate	-0.12	-1.10	-0.03	-1.10
Safety	0.33	0.70	0.08	0.70
Source	0.59*	1.89	0.15*	1.90
COOL	0.76**	2.25	0.19**	2.25
Local	0.59**	1.94	0.15**	1.94
Fresh	1.24*	1.76	0.31*	1.76
Organic	-0.48	-1.45	-0.12	-1.45
BeefEat	0.16	0.53	0.04	0.53
NonGrocery	1.11**	2.26	0.27**	2.27
USDAGrade	-0.02	-0.18	-0.01	-0.19

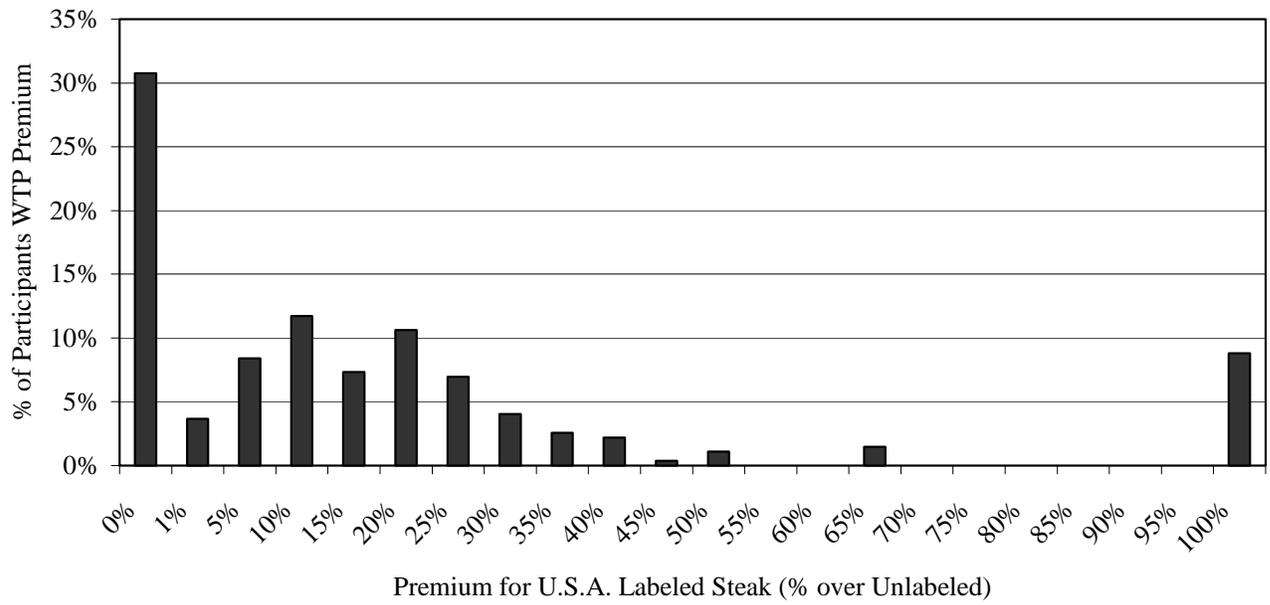
(\*) Denotes statistical significance at  $\alpha = .10$  level.

(\*\*) Denotes statistical significance at  $\alpha = 0.05$  level.

n = 255 (273 consumers actually participated in the study; however, the number of usable observations is reduced due to missing data.)

Number of correct predictions = 67.5%

Model chi-squared value = 34.16 and is significant at the  $\alpha = 0.01$  level.



**Figure 1. The Distribution of Participants' Premiums for the U.S.A. Labeled Steak over the Non-Labeled Steak.**