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

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In 2002, Chicago and Denver consumers were surveyed and participated in an experimental auction to elicit willingness to pay for country-of-origin labeling (COOL) of beef. Survey results indicate 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 "U.S.A. Guaranteed: Born and Raised in the U.S." Food-safety concerns, preferences 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 reasons consumers preferred COOL.

Consumers are becoming increasingly concerned with the quality, safety and production attributes of their food (Caswell 1998). Consumers' concerns with the safety and origin of beef are especially true in light of recent European and Japanese BSE outbreaks and occurrences of *E-coli 0157:H7* in U.S. beef (Shiptsova, Thomsen, and Goodwin 2002). The origin and processes used to produce beef products are not apparent to the consumer through experience, consumption, or visual inspection of products. Therefore, without additional information consumers cannot differentiate the origin of or processes used to produce beef products. Production attributes that may be valued by consumers, such as country of origin, are considered *credence characteristics* (Darby and Karni 1973; Caswell and Mojduszka 1996). Truthful labeling of credence characteristics allows consumers to judge products before purchasing (Caswell 1998).

Given that country of origin of beef is a credence attribute, consumer-advocacy groups and some agricultural-producer groups have petitioned for a mandatory country-of-origin labeling (COOL) law in the United States. After many years of debate a mandatory COOL program was passed as Title X, Section 10816 of the Farm Security and Rural Investment Act of 2002 (the 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 agricultural commodities such as ground meat and muscle cuts from beef, lamb, and pork.[1] For a beef product to be labeled as a "Product of U.S.A." the beef animal must be born, raised, and processed in the United States. Initially, COOL is a voluntary program; it does not become mandatory until 2004. (U.S. Senate 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 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 ensure compliance would outweigh the benefits of labeling (USDA/FSIS 2000). Other critics have argued that mandatory COOL would impose a trade barrier and instigate trade wars (see Schupp and Gillespie 2001a and 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 food markets, information provided through required labeling disclosures "may change the attitude of the consumers or consumers advocate (even if the

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[1] Other commodities included in the mandatory COOL provision were farm-raised fish and shellfish, wild fish and shellfish, peanuts, and fresh fruits and vegetables (U.S. Senate Farm Bill Conference Framework 2002).

consumers do not read or understand it) and may change the sellers' strategy (Caswell and Padberg 1992, 466)." Furthermore, because of the potentially broad impact that food labels can have on consumers' confidence in food quality, on their education about diet and health, and on their overall behavior, policy-makers must take into account the benefits and costs of labeling policies and should evaluate how alternative methods impact consumers' behavior and sellers' strategies (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).[2] Thus labeling policies should enhance the information available to consumers, improving the efficiency of the market (Caswell 1998). A mandatory country-of-origin labeling program would be an appropriate policy tool if asymmetric information exists, 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 since it would transform country-of-origin attributes into search characteristics. However, the impact that COOL will have on beef demand is unknown. 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 "U.S.A. Guaranteed: Born and Raised in the U.S." 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 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 geographical labeling of 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 of beef (Schupp and Gillespie 2001a and 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 their customers would benefit from the increased information provided by COOL. However, restaurants and firms already using imported beef were less likely to support mandatory COOL. Schupp and Gillespie's (2001a) research indicates consumers would be supportive of mandatory COOL of beef; however, they did not determine if consumers would be willing to pay a premium to offset the potential costs of mandatory COOL.

Several recent studies have examined international consumers' WTP for labels verifying the source of origin. Quagrainie, Untershchultz, and Veeman (1998) 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

[2] The uncertainty over who will bear the burden of the costs versus potential benefits is likely one reason COOL has not been voluntarily implemented. A GAO (2000) study concluded that the distribution of mandatory COOL compliance costs among producers, packers, processors, distributors, retailers, and consumers was unclear.

strategies associated with origin-labeling, private brands, and mandatory labeling of beef from cattle fed genetically modified corn. Consumers in France and Germany indicated the origin of beef was more important than any other product attribute, 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, which are already perceived to have high intrinsic value.

To assess if consumers were willing to pay for a mandatory COOL program, Loureiro and Umberger (2003) surveyed 243 Colorado consumers during Spring 2002. They found Colorado consumers were willing to pay approximately $184 per year for a mandatory COOL program. The same consumers indicated 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 traceabilty. Golan, Krissoff, and Kuchler (2002) discuss the different goals of food-system traceability for the public and private sectors. The public sector's objectives are to provide consumers with information in the case of a market failure, to prevent fraudulent labeling claims, and to ensure sufficient records for traceback in the case of a food-borne illness. However, the private sector's primary objectives from food traceability are to provide consumers with quality assurance and to increase supply-chain management (Golan, Krissoff, and Kuchler 2002).

Some agricultural producer groups believe a traceability system is needed in the United States to increase food safety, and they argue COOL will be meaningless to consumers unless meat can be traced back to the farm or animal of origin. Other producers adamantly oppose any form of mandatory traceback, fearing the additional costs and potential liabilities associated with such a system (Smith 2003). The COOL law prohibits the U.S. Secretary of Agriculture from establishing a mandatory animal-identification program for COOL but requires a verifiable and auditable recordkeeping trail to validate compliance.

Some producers groups believe they should be allowed to self-certify the country of origin of their animals. The USDA Agricultural Marketing Service (USDA/AMS 2002), the agency responsible for writing the final mandatory COOL rules, has stated self-certification is not sufficient, and a credible COOL program will require verifiable records and a system allowing products to be traced back to the animal of origin (Smith 2003). Others have argued that a domestic traceback system is not required to implement COOL, and that the least costly method for regulating COOL is presumption of U.S. origin unless the food product carries a label indicating it is a product of another country (Smith 2003; VanSickle et al. 2003).

The necessary documentation and verification for mandatory COOL is a complex issue. Regardless of the discussion, Dickinson and Bailey (2002) recently conducted research evaluating consumers' preferences for beef and pork products guaranteed to be traceable to the animal of origin, as well as for other credence attributes: humane animal treatment, no added growth hormones, and food-safety assurance. Although consumers in the that study valued and were willing to pay for traceability, they placed a higher value on food-safety assurance and the other credence attributes which are only verifiable through a traceback system.

The recently passed mandatory COOL law has increased the demand for information regarding U.S. consumers' perceptions of and willingness to pay for COOL, 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 "U.S.A. 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 recruited to participate in a study on beef quality where they would be paid $50 for two hours of their time. Qualifying individuals who agreed to participate were scheduled for one

of 12 panels in each city. Consumers were paid the $50 upon their arrival at the designated research facility; they then completed surveys describing their meat-purchasing behavior, knowledge of beef and socio-demographic characteristics. They also 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, a random *n*th-price auction (Shogren et al. 1994) was explained to participants. The research monitor explained to participants that they would have the opportunity to bid on steaks in several auctions and that their bids would determine the prices paid for the steaks in the auctions. Panelists were told that the market price would be the second-, third-, or fourth-highest price, and they would have won the auction if their bid exceeded the market price. Participants were encouraged to bid exactly what they believed the product was worth to them.

Following the auction explanation, 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. Consumers were told the USDA had inspected both steaks. The main difference between the two steaks was that one package had a label stating "U.S.A. Guaranteed: Born and Raised in the U.S." 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 determined the market price for each auction and the binding auction (either the labeled or unlabeled steak auction). Consumers then moved into taste-panel booths to complete the taste-preference portion of the study.[3]

Modeling Consumers Preferences

A binomial logit model was used to specify the relationship between demographic variables, product characteristics, and a consumer's likelihood of preferring and being willing to pay a substantial premium for a "U.S.A. Guaranteed" steak. Let consumer *i*'s WTP for the "U.S.A. Guaranteed" steak, measured through their auction bid, be equal to WTP_{ij} and their WTP for the unlabeled steak be equal to WTP_{ik}. To assess consumer *i*'s premium for the U.S.-labeled steak, the difference between WTP_{ij} and WTP_{ik} was calculated and divided by the bid for the unlabeled steak, WTP_{ik}. If a consumer's premium was larger than 10%, the consumer was considered to have a strong preference for a steak labeled "U.S.A. Guaranteed" 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. Given that $USAPREF_i$ can equal either 0 or 1, the logistic probability distribution is assumed, and defined as:

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

where $USAPREF_i$ is as defined earlier, X_i' is a vector of explanatory variables that may influence a consumer's WTP for the "U.S.A. Guaranteed" steak, β is the vector of coefficients, and ε_i is an error term (Greene 1998).

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

$$(2)\quad USAPREF_i = \beta_0 + \beta_1 Location_i + \beta_2 Age_i + \beta_3 Gender_i + \beta_4 Ethnic + \beta_5 Kids_i + \beta_6 Income_i + \beta_7 Educate_i + \beta_8 Safety_i + \beta_9 Source_i + \beta_{10} COOL_i + \beta_{11} Local_i + \beta_{12} Fresh_i + \beta_{13} Organic_i + \beta_{14} BeefEat_i + \beta_{15} NonGrocery_i + \beta_{16} USDAGRADE_i + \varepsilon_i$$

where $USAPREF_i$ 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 presence of children 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

[3] This research was part of a larger study on consumers' taste preferences for beef quality attributes. The experimental methods and results of the taste panels can be found in Sitz (2003).

safety, source assurance, country of origin, locally produced, fresh, and organic are extremely desirable attributes in a consumer's shopping decision, respectively. *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 ε_i is the random error term. The variables are further explained in Table 1 and Table 2.

Results

A total of 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 female (73%) and Caucasian (87%). On average, participants were about 40 years of age, married, had two children under the age of 18 living in their household, and had some college education. The mean household-income level of the sample was \$50,000–\$60,000,[4] and most participants (74%) were employed either full- or part-time. Beef and chicken were the primary meat products consumed, with the majority of the consumers (70%) indicating they preferred to consume beef. On average, quality (50%) was the primary factor determining consumers' meat-purchasing decisions. Hamburger and steak were the beef products consumers most preferred to have labeled with country of origin.

Consumers were asked to rank the importance of a series of food characteristics when purchasing beef. Summary statistics for beef attributes important to consumers are reported 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—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.

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, the majority of participants (75%) indicated they preferred to purchase the country-of-origin labeled product, 22% were indifferent, and 3% preferred to purchase the unlabeled product. Participants who preferred to purchase country-of-origin labeled products were asked to explain why they preferred COOL. Their reasons for choosing the labeled product were grouped into six categories: safety and health of meat, freshness of meat, quality of meat, support of producers, location, and general information. Selected comments from participants, and the percentage of participants identifying each characteristic as the basis for their preference for COOL are shown in Table 3. Food-safety concerns regarding 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 COOL are similar to those specified by Schupp and Gillespie (2001a) and the USDA/FSIS (2000).

After specifying their preferences for COOL, consumers were asked to indicate the most they would be willing to pay per pound to have their beef steaks labeled with country of origin. Participants were told the price of the unlabeled steak was \$4.00/pound. They also were asked to complete the same WTP question for hamburger priced initially at \$1.50/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, regardless of whether or not they indicated a preference for COOL. Consumers were willing to pay an average of \$0.42/pound more for COOL of steak, an 11% premium. Consumers were willing to pay more for labeling of hamburger than for labeling of steak; the average premium for country-of-origin labeled hamburger was \$0.36/pound, a 24% premium.

[4] The mean U.S. household income was \$56,644 in 1999. The mean household income in 1999 for Chicago and Denver was \$67,321 and \$66,209, respectively (U.S. Census Bureau 2000).

Table 1. Definitions of Demographic Variables and Summary Statistics.

Variable	Description	Mean	Std. deviation
Gender	0 = Female; 1 = Male	0.27	0.45
Location	0 = Denver; 1 = Chicago	0.52	0.50
Age	1 = 18 to 21 years; 2 = 22 to 24 years …9 = 55 to 59 years; 10 = Over 60 years	6.07	1.93
Ethnic background	0 = Caucasian; 1 = Other	0.25	0.81
Education level	1 = Elementary school; 2 = Some high school; 3 = Completed high school; 4 = Some college; 5 = Completed junior college; 6 = Completed a 4-year university; 7 = Graduate school	4.85	1.36
Employment status	1 = Student; 2 = Part-time; 3 = Full-time; 4 = Not employed	2.91	0.77
Income	1 = Less than $20,000; 2 = $20,000 to $24,999 … 8 = $60,000 to $69,999; 9 = $70,000 or more	7.09	2.28
Martial status	1 = Single; 2 = Divorced; 3 = Separated; 4 = Married; 5 = Widowed; 6 = Domestic Partnership	3.43	1.20
Children in household	1 = Yes; 0 = No	1.37	0.48
No. of children	1 = 1; 2 = 2 … 6 = more than 5	2.12	1.00
Preferred beef product to consume	1 = Beef	1.65	1.10
Meat product most consumed at home	1 = Beef; 0 = Pork, Chicken, Lamb, Fish, Elk, Shrimp, Turkey	0.69	0.46
Beef product most often purchased for consumption at home	1 = Steaks; 2 = Ground beef or hamburger 3 = Roasts 4 = Other	1.75	0.83
Grade of steaks purchased for household consumption	1 = USDA Choice or Select; 0 = other	0.59	0.49
Primary factor in meat purchasing decisions	1 = Quality; 0 = Price, Health, or other	0.50	0.50
Place where typically purchase beef products	0 = Retail or warehouse store; 1 = Butcher shop, specialty health store, or private farmer or rancher	0.12	0.33

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).

Attribute	Mean	Standard deviation
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

Loureiro and Umberger (2003) also found WTP for COOL of hamburger to be significantly higher than for COOL of steak.

Experimental Results

After visually evaluating the "U.S.A. Guaranteed" labeled and unlabeled steaks, consumers submitted bids in $/pound for each of the steaks. The average auction prices consumers bid for each steak are presented in Table 5. Sixty-nine percent of the participants bid more for, and were willing to pay a premium for the steak labeled as "U.S.A. Guaranteed." However, 7% of the consumers preferred and bid more for the nonlabeled steak, and 24% of the consumers showed no preference between the two steaks.

Consumers were willing to pay an average premium of 19%, or $0.81/pound more, for the "U.S.A. Guaranteed"-labeled steak than for the nonlabeled steak. Consumers in Chicago were willing to pay a significantly higher premium of 23% for the labeled steak than were the Denver participants, who were willing to pay only a 14% premium for the U.S.-labeled steak. The steak premiums for COOL from the auction are larger than those elicited through the survey method. This may be because consumers were able to see the product they were bidding on and because the country of origin was specified.

The distribution of premiums consumers were

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

Category	Selected comments	Percent[a]
Safety and health of meat	• Food safety inspections, regulations, and health standards are not as stringent outside of U.S. • Trust U.S. health standards. • Mad cow disease in some countries. • To know what I'm eating was produced somewhere clean and safe. • Do not trust beef from outside of the United States. • Safety—if I knew the meat came from reputable sources, I would worry less about getting bad meat. • For future information in case there was a health or safety problem involving the meat consumed. • With the food safety controversy, I am more cautious than before label helps.	45.0%
Freshness of meat	• U.S.A. meat is fresher. • Believe label indicating a closer geographical region would be fresher meat.	4.5%
Quality of meat	• U.S. beef is higher quality. • Label provides me with a better feeling of health and quality. • U.S. has more quality control, stricter animal feed regulations, and less chemicals are used in processing.	11.0%
Support producers	• Want to support U.S. farmers and ranchers; also don't want to buy beef raised in areas where rainforests are burned down. • I want to support U.S. farmers. • 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. • I buy mostly organic meat, want to support a reputable organic farm.	21.0%
Location	• I would prefer beef from the United States, Australia, or Argentina. • Prefer meat from Colorado because familiar with quality. • 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. • If not produced in U.S.A. or Canada, I would have concerns about the safety. • I would be concerned if it was from England. • Some countries have better reputation in beef industry (i.e. New Zealand Lamb). • Would like to learn about the company and country producing beef—where animals come from, their feeding and handling processes.	12.5%
General information	• More information is always desirable; it gives me confidence in the product. • Label tells me about the way cattle were fed and raised. • I prefer anything labeled vs. unlabeled—(label) makes me feel like I had some decision in purchase selection. • If there's a recall it would be easier to identify where meat comes from. • 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. • Aware of the inspection and/or conditions in which the meat was processed. • Label allows me to feel more comfortable with the product.	31.8%

[a] The percentages do not add up to 100% because some comments fit multiple categories.

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

	Steak			Hamburger		
	Premium[a] $/pound	% Premium	% Population[b]	Premium[c] $/pound	% Premium	% Population[b]
Denver	$0.36[d]	9.1%	83.0%	$0.36[d]	24.3%	81.1%
(Std deviation)	(0.54)			(0.43)		
Chicago	$0.48[d]	12.0%	67.4%	$0.36[d]	24.3%	67.4%
(Std deviation)	(0.63)			(0.39)		
Overall	$0.42[d]	10.5%	72.9%	$0.36[d]	24.3%	71.8%
(Std deviation)	(0.59)			(0.41)		

[a] Premium is the most that a participant would be willing to pay per-pound in addition to a $4.00/pound steak price.
[b] Percent of the population that indicated they would be willing to pay a premium for country-of-origin labeling of steak or hamburger
[c] Premium is the most that a participant would be willing to pay per-pound in addition to a $1.50/pound hamburger price.
[d] Premium is statistically different from zero ($\alpha = 0.05$).

willing to pay for the U.S.-labeled steak is shown in Figure 1. The percent premium category labeled as "0% premium" includes both consumers who had no preference between the labeled and nonlabeled product and those consumers who preferred the nonlabeled steak; thus this category accounts for 31% of the consumers. Over one-half (56%) of participants were willing to pay a premium greater than 10%—about one-third (30%) of participants were willing to pay a premium ranging between 10% to 25%, and a small number of participants (10%) were willing to pay a premium of more than 50%.

The results of the estimated binomial logit model (equation 2) are presented in Table 6. The marginal effects represent the change in the probability that a consumer is willing to pay more than 10% extra for the steak labeled as "U.S.A. Guaranteed" when the independent variable changes by one unit. The logit model estimated 68% of the individual choices correctly and is significant at $\alpha = 0.01$. All of the variables for which coefficient estimates are significant have the expected signs except *Income*. An initial hypothesis was that higher income levels 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). 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 (Loureiro and Umberger 2003).

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 consumers who find a label guaranteeing the country of origin of their beef products or certifying the beef product was raised in their region of the country are respectively 19% and 15% more likely to pay a premium for the U.S.-labeled product. Additionally, consumers who tend to purchase their meat from a butcher shop, private meat market, or directly from the producer rather than at the supermarket 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 respectively 15% and 31% more likely to pay a premium for the U.S.-labeled product.

Table 5. Average Auction Bids ($/pound) and Bid Difference for "U.S. Guaranteed" and Non-labeled Steaks (Standard Deviations in Parentheses).

Treatment	Chicago mean (Standard deviation)	Denver mean (Standard deviation)	Overall mean (Standard deviation)
"U.S. Guaranteed" steak	$5.56	$4.69 [a]	$5.14
	(1.69)	(1.61)	(1.71)
Non-labeled steak	$4.53	$4.12 [a]	$4.33
	(2.15)	(1.69)	(1.95)
Difference (U.S.-labeled vs. non-labeled)	$1.03 (1.67) [b]	$0.57 (1.22) [b]	$0.81 (1.49) [b]
	n = 141	n = 132	n = 273

[a] Mean bids are significantly different between locations (α = 0.05).
[b] Mean bids are significantly different between treatments (α = 0.05).

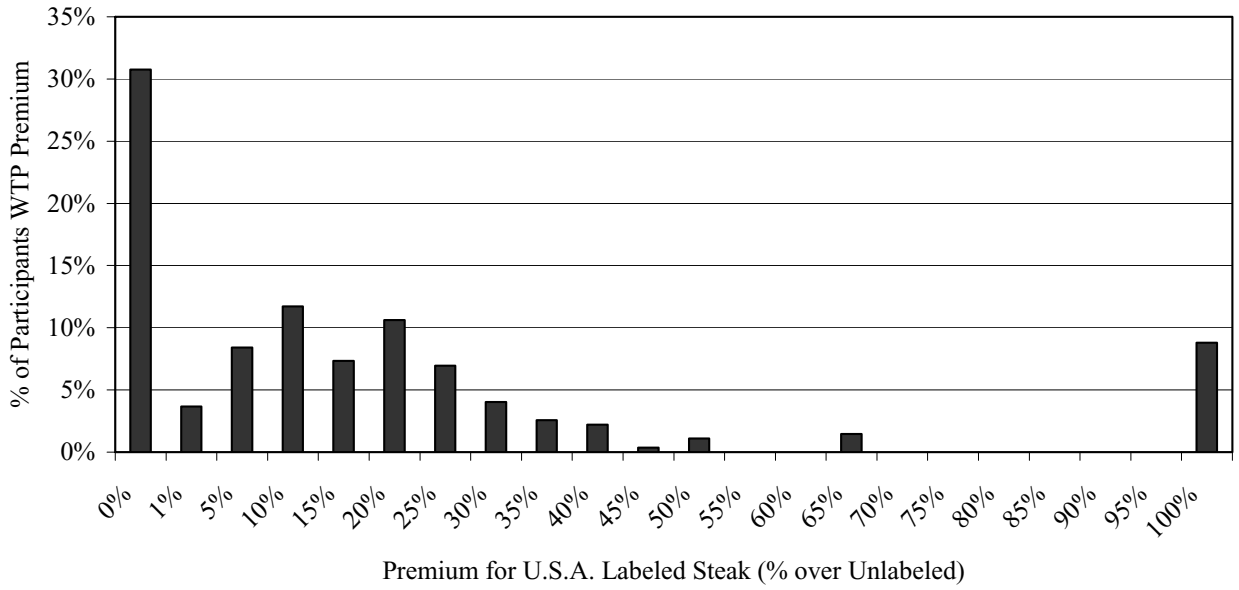

Figure 1. Distribution of Participants' Premiums for the "U.S. Guaranteed" Steak over the Non-Labeled Steak.

Table 6. Logit Estimates and Marginal Effects for the Willingness to Pay for Steak Labeled "U.S. Guaranteed."

Variable	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 $\alpha = 0.10$ 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.

Summary and Conclusions

In 2002, 273 consumers in Chicago and Denver and participated in a survey and an experimental auction to elicit their willingness to pay for country-of-origin labeling of beef. The survey results indicate the majority of consumers (73%) were willing to pay an 11% and 24% premium for COOL of steak and hamburger, respectively. Consumers' most-commonly cited reasons 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 where they bid on two steaks, one labeled "U.S.A. Guaranteed: Born and Raised in the United States" and the other unlabeled. On average,

consumers were willing to pay a 19% premium for the "U.S.A. Guaranteed" steak. 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 to be "extremely desirable" are more likely to be willing to pay for a steak labeled "U.S.A. 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 "U.S.A. Guaranteed" steak.

A large percentage of consumers appear to be willing to pay a premium for COOL. However, it is important to point out that a number of factors related to experimental design could impact the size of premiums.[5] For example, the results would likely have been different if consumers had been asked to express their willingness to pay for a broader set of products, such as an unbranded, traditionally labeled beef product; a "Product of the U.S.;" and a "Product of Canada;" or other substitute meat products such as different cuts of beef, pork, and poultry. Potential consumer reactions to labels based on the USDA/AMS-proposed regulations covering mixed-species products (e.g., an ingredient statement might read "Product of Canada, Raised and Processed in the United States") are unexplored but would be expected to be quite different from the results based on the labels used in our study.[6] Furthermore, because no other labels—such as price, safe handling instructions, USDA grade, or brand--were on the package, it is likely that the willingness-to-pay values observed in this study are higher than would actually exist in the market, because consumers were specifically asked to focus on the country-of-origin label. Additionally, the results are based on a small sample of consumers from Denver and Chicago. The premiums may differ if a larger sample of consumers (more representative of the U.S. population) were surveyed.

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.

[5] WTP estimates elicited from hypothetical survey methods tend to overestimate the amount consumers will actually pay in the market (Loomis and Walsh 1997; Lusk et al. 2001) . Experimental design may also impact and bias WTP values (Lusk et al. 2001; Loureiro, Umberger, and Hine 2003; Umberger and Feuz 2004).

[6] Plain and Grimes (2003) discuss this issue and report that in 2002 approximately 89% of steaks and roasts sold in the U.S. were of U.S. origin. Therefore, if 69% of consumers were truly willing to pay a premium for beef from the United States, premiums for U.S. beef would not exist because quantity supplied would exceed quantity demanded (Plain and Grimes 2003).

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