Consumer Attitudes Toward Potential Country-of-Origin Labeling of Fresh or Frozen Beef

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A sample of Louisiana households was surveyed by mail to estimate their degree of support for compulsory country-of-origin labeling of fresh or frozen beef in grocery stores and restaurants. This potential requirement for grocery stores and restaurants was supported by 93 and 88 percent of respondents, respectively. Binomial probit analysis identified the socioeconomic characteristics of consumers with respect to their decision on the labeling of fresh or frozen beef in grocery stores and restaurants. Important variables for both types of outlets were "prefer domestic over imported durable goods," "consider domestic beef safer than imported beef," and "male."

While food shopping, consumers often look for distinguishing features of products to select among the many items available. Brands, labels, store signs, distinctive packaging, and other recognizable features help consumers distinguish one product from another. For example, *Certified Black Angus Beef* is differentiated from other meat by its distinctive label and promotional material.

The consumer can also identify some differences between particular cuts of beef—say, rump roasts—by looking for the United States Department of Agriculture (USDA) Quality Grade label. Consumers can use this aggregated information to help them answer questions regarding the beef cut's edibility, economic value, safety, nutritive content and suitability for particular meal uses.

Another attribute that beef consumers may desire to know is the country-of-origin. Beef marketed in U.S. grocery stores and restaurants is either domestic or imported. While U.S. tariff provisions require all fresh or frozen beef imported into the U.S. to be conspicuously labeled with country-of-origin on bulk containers (Becker 1999), this designation need not accompany the product once it is removed from the import container. At the point of initial repackaging, all imported fresh or frozen beef blends in with U.S.-produced beef. The consumer cannot visually distinguish between imported and U.S.-produced fresh or frozen beef. Therefore U.S. consumers do not know whether the fresh ground beef and intact muscle cuts being sold in grocery stores or served in restaurants have been produced under U.S. standards and regulations or in a country licensed to export fresh or frozen beef to the U.S.

While the USDA has stated that imported beef meets all wholesomeness and cleanliness standards required in USDA-inspected beef slaughter plants, some potential beef consumers have concern with the safety of the overall U.S. beef supply. Potential problems associated with beef safety (residues, disease, chemical use, etc.) cannot be shown with certainty to differ among beef products produced in the U.S. and similar products imported as fresh or frozen beef. However, the U.S. beef cattle industry is more restricted in its use of growth stimulants than many of the beef industries in countries licensed to export fresh or frozen beef into the U.S. (Committee on Agriculture 1999). Given the broad-brush perceptions of many consumers toward food safety, the continuing turmoil worldwide over bovine spongiform encephalopathy (mad cow disease) and foot-and-mouth disease tends to increase consumer concerns with the safety of the total beef supply since consumers cannot now distinguish U.S.-produced beef from the total beef supply.

U.S. producers provide 85 to 92 percent of the beef consumed in the U.S., the actual quantity depending on whether live imports from adjoining countries are included (Committee on Agriculture 1999). In 1998 approximately 13 percent of the U.S. total beef supply was imported from 11 countries, primarily Argentina, Brazil, Canada, Mexico and New Zealand. While much of this imported beef is subsequently processed or mixed with U.S. beef to make ground products, in 1998, approximately 10.3 percent of the total U.S. beef supply consisted of

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intact muscle cuts derived from carcases imported from Canada and several other countries (Brester and Smith, 2000).

The National Cattlemen's Beef Association (NCBA 1998) has passed resolutions at its annual meetings calling for country-of-origin labeling of fresh beef. The NCBA wants all fresh or frozen beef sold in grocery stores and restaurants to be labeled by country-of-origin either voluntarily by the retailer (restaurant) or required by legislation. The NCBA has argued that domestic beef-producer efforts to improve the quality and safety of U.S.-produced beef cannot be justified as long as consumers cannot distinguish between domestic and imported beef (Committee on Agriculture 1999). Currently, consumers desiring to purchase and consume only domestic beef or imported beef cannot do so in the typical U.S. grocery store or restaurant.

Objectives

The overall objective of this research is to estimate consumer reaction to mandatory country-of-origin labeling of fresh or frozen beef in grocery stores and restaurants. The specific sub-objectives are to ascertain how consumers rate U.S. beef relative to imported beef, to estimate consumer preferences as to the preferred methods of identifying the country-of-origin of fresh or frozen beef in grocery stores and restaurants, and to estimate the impact of socioeconomic characteristics of households on the householder's decision to either favor or not favor country-of-origin labeling of fresh or frozen beef in grocery stores and restaurants.

Previous Research and Current Situation

Some agricultural products sold in grocery stores are identified with their area of production in the U.S. Many states have labeled products as "[state]-Grown" to differentiate their products from those of competing states. Examples include: Washington apples, Vermont maple syrup, Mississippi farm-raised catfish, and Jersey fresh produce. The latest entry into this group is Texas, which has begun an effort to get its citizens to buy "Texas-produced" food products. The use of state logos on agricultural products is based on the premise that consumers will support local producers and processors as long as the products are priced equally and the quality of the in-state product is equal to or better than out of state products.

Labor unions and other industry groups have been concerned that increasing sales of imported products in the U.S. have led to a loss of jobs to firms in other countries; hence they have promoted a "Buy American" theme to U.S. consumers. Survey data reveal positive relationships between consumer preferences for domestic products and feelings of comradery with workers, social concern for members of society, a pro-ethnocentric orientation, and patriotism, but only if prices are equal and the in-state product is of same or higher quality (Granzin and Olsen 1998).

In July 1998 the U.S. Senate attached amendments to the FY 1999 agricultural appropriations bill that would have required country-of-origin labeling of produce and fresh beef and lamb (Becker 1999). However, the U.S. House-Senate conferees removed the amendments prior to eventual passage of the bill. Similar bills did not get out of committee in 1999 or 2000.

In 1999 the Louisiana Legislature passed legislation requiring all fresh meats sold in grocery stores to be labeled as "imported" or "American" if unmixed and labeled as "blended" if a mix of imported and domestic meats. While this law was effective January 1, 2000, actual implementation did not occur until July 1, 2001 after specific actions were taken by the Louisiana Department of Agriculture and Forestry. The Kansas Legislature passed a recurrent resolution in 1999 urging the U.S. Congress to require country-of-origin labeling of meat and dairy products (Kansas Legislative Services 2000).

Other examples of mandatory country-of-origin labeling are in Florida and Maine. Florida's mandatory country-of-origin labeling requirement for fresh produce has been in place for nearly 20 years (Committee on Agriculture 1999), while Maine's law has been in existence since 1989 (Maine Revised Statutes 2000). Seller compliance with the Florida law depends heavily upon consumers reporting those establishments that do not provide the label. Compliance with the Maine law is checked by state representatives.

A GAO (2000) report provides some estimates of the annual costs that U.S. meatpackers and grocery retailers would incur for record-keeping, inventory management, and the physical labeling of

country-of-origin for meats that they cut, blend, and grind in their stores. GAO also estimate the costs that the U.S. Food Safety and Inspection Service would incur in enforcing the mandatory country-of-origin labeling of beef and lamb in the U.S.

Wirthlin Worldwide surveyed 1000 U.S. households in November 1998 regarding their preferences toward mandatory country-of-origin labeling of fresh or frozen beef in stores and restaurants (Committee on Agriculture 1999). Seventy-eight percent of the respondents supported country-of-origin labeling. A follow-up survey in March 1999 found 91 percent of respondents preferred to purchase U.S. beef when offered a choice between "Product of the United States" and "Imported Product." Of these 91 percent, 69 percent "prefer American products, are loyal to American products, or support U.S. agriculture," 13 percent felt that "American beef is safer" and nine percent felt that "U.S. beef is of higher quality."

Juric and Worsley (1998) interviewed 315 New Zealand consumers concerning their perceptions of the nutritional value, safety, quality, taste, price, value and environmental impact of selected food products on their preferences between food products from New Zealand and six other countries. The main consumer-related factors influencing their perceptions of foreign food products relative to domestic food products were ethnocentrism, consumer interest in foreign cultures, income, education, age, and sex.

Data, Model, and Methods

A mail survey was used to sample household acceptance of country-of-origin labeling of beef. The questionnaire was developed, reviewed, and revised based on Dillman (1978) procedures. A series of questions was used to estimate consumer attitudes toward imported beef relative to domestic beef, whether consumers favored compulsory country-of-origin labeling of fresh and frozen beef in grocery stores and/or restaurants, and how the actual labeling process should be done. The respondents also provided selected socioeconomic data.

A list of 2000 randomly selected households was obtained from the Louisiana Department of Public Safety-Vehicle Registration Division. These households were located in eight randomly selected parishes—four rural and four urban. Since 86 percent of Louisiana households have at least one registered motor vehicle and approximately 50 percent of the Louisiana population lives in the urban parishes, the sample should be representative of Louisiana households.

The theoretical framework relevant to the problem under investigation in this study follows that summarized by Capps and Schmitz (1991) and Menkhaus et al. (1993). Specifically, the utility function is expressed as

$$(1) \qquad U_t = U(q_t; \theta(\alpha_t))$$

where utility (U_t) is dependent on the commodity vector (q_t) and (α_t) are perceptions of the country-of-origin label's value by the consumer in time t. Maximization of (1) with respect to q_t, given α_t, subject to the income constraint, yields the demand relationship

$$(2) \qquad q_t = q_t(y; p; \theta(\alpha_t))$$

where p is a vector of prices and y is income.

The focus of this study is directed toward identifying perceived consumer characteristics that influence consumers' perceptions of the label's value. Since the presence of the label adds to the consumer's knowledge base, its existence has legitimate value.

Binomial probit analysis was used to analyze respondent attitudes toward compulsory country-of-origin labeling of fresh or frozen beef in Louisiana food stores and restaurants, with separate models employed for each. Following Judge et al. (1988), binary choice models can be used to model the choice behavior of individuals when two alternatives are available and one must be chosen. Since the marginal effect on the dependent variable of a one-unit change in socioeconomic (explanatory) variables is not constant over the entire range of the explanatory variable, the maximum-likelihood estimation technique is used (Crown 1998). Use of the latter technique also assures the large sample properties of consistency and asymptotic normality of the parameter estimates (Capps and Kramer 1985).

The maximum likelihood coefficients estimated through probit have no direct interpretation other than indicating a direction of influence on probability. The calculated changes in probabili-

ties indicate the magnitude of the marginal effects.

The two dependent variables (q_i) selected for probit analyses were, "Do you favor compulsory country-of-origin labeling of fresh or frozen beef in food stores?" and, "Do you favor restaurants being required to label the country-of-origin of fresh or frozen beef used in their meals?" Positive responses to these two questions indicate that the individual feels that a country-of-origin label would be useful in making purchase decisions for beef in food stores and restaurants.

Definitions of the 16 explanatory variables (θ (α_t)) used in the probit analysis are provided in Table 1 along with their expected signs relative to the two dependent variables. The selection of these variables was based on previous consumer-research studies of nutrition or ingredient labeling, consultation with a number of consumers prior to the final revision, and suggestions of reviewers of the original experiment station research project.

Respondents were asked whether they would buy domestic durable products rather than imported durable products if both were of the same quality. Those who responded positively were expected to favor country-of-origin labeling of fresh or frozen beef because preferences for durable products were expected to carry over to the perishable food product. Consumers who regularly read nutrition labels on food packages were also expected to favor country-of-origin labeling because it would provide additional information for the purchase decision. Respondents who rated domestic beef better than imported beef for safety related reasons (purity, safety and/or disease) were also expected to favor the

Table 1. Definitions and Expected Signs of Independent Variables Used in the Probit Analyses, Country-of-Origin Beef Labeling, Louisiana Households, 1999.

Independent Variable	Expected Sign	Definition
Choose Domestic Products	Pos	1 if buy domestic durable products at same or higher price than imported; 0 otherwise
Domestic Beef Safer	Pos	1 if concerned with the purity, safety and disease carrying of imported beef; 0 otherwise
Domestic Beef Higher Quality	Pos	1 if rate domestic beef of higher quality than imported beef; 0 otherwise
Read Nutrition Labels	Pos	1 if regularly read nutrition labels; 0 otherwise
Male	Neg	1 if male; 0 otherwise
Age	Pos/Neg	Continuous variable
Age Squared	Pos/Neg	Continuous variable
Household Head (hh) Single	Neg	1 if household head is single; 0 otherwise
Children in Household	Pos/Neg	1 if household contains children; 0 otherwise
College Graduate	Pos	1 if hh head has college degree ; 0 otherwise
Homemaker	Pos	1 if adult female is homemaker; 0 otherwise
Caucasian	Pos/Neg	1 if household is Caucasian; 0 otherwise
Rural	Pos	1 if household is in rural area or small town; 0 otherwise
Large City	Neg	1 if household is in a large city (>500,000); 0 otherwise
Income >$45,000	Pos	1 if hh income is more than $45,000; 0 otherwise
No Farm Relationship	Pos/Neg	1 if hh has no farm relationship; 0 otherwise

The two Dependent Variables used were: *Do you favor compulsory country-of-origin labeling of fresh or frozen beef in food stores?* and *Do you favor restaurants being required to label on the menu the country-of-origin of fresh or frozen beef used in their meals?*

country-of-origin labeling of fresh or frozen beef. Consumers who rated U.S.-produced beef of higher quality than imported beef were also expected to favor the label because the label would enable these consumers to obtain their preferred beef product.

While most of the independent variables were expected to have either positive or indeterminate effects on the respondents decision on country-of-origin labeling, several, including male and large city residence, were expected to be negative in their influence. Males were expected to be less favorable toward country-of-origin labeling because of their lower experience with food nutrition labels (Schupp, Piedra and Montgomery 1995, Committee on Agriculture 1999). Consumers in cities (the larger metropolitan areas) were expected to be less favorable to the label because of their lower knowledge of food production and how it affects the product in the grocery store or restaurant.

Respondents with incomes greater than $45,000 were expected to favor the label requirement in the expectation that imposition of the label leads to a larger variety of beef products in the marketplace. Respondents holding college degrees were expected to favor the label requirement based on a desire to know more about the products being consumed. Respondents in rural areas were expected to favor the label requirement because of their economic ties with the agricultural community. Small local producers of meat products are also more likely to market to stores and restaurants which are located in the more sparsely populated areas, thus increasing the rural consumer's interest in domestic beef. Households with homemakers were expected to favor the retail-label requirement because it would provide the homemaker more information for meal preparation.

The presence of children in the household could have several effects on the respondents' attitude toward the label requirement. The desire of parents to provide a safe and quality product for children would increase interest in labels (Blaylock, Variyam, and Lin 1999), but time and budgetary constraints placed on households with children could lead to lower interest in labels. The sign of the household with children variable was therefore considered indeterminate.

Interest in product labels of most kinds could decline with age because consumers tend to become less flexible in the food items they will accept with increasing age. However, older consumers have more time to spend in the grocery store or restaurant, which could be spent on reading labels. Han (1988) reported that older consumers tended to be more patriotic, which would encourage acceptance and use of the label. The effect of age was considered indeterminate. An age-squared term was included to account for the possibility that with age, growing health concerns would lead to increasing desire for the label's assurances.

Prior research or economic theory provides little guidance on the influence of racial composition on the degree of acceptance of country-of-origin labels for beef. Therefore, the sign of the Caucasian variable was considered indeterminate. Single adult households could be less favorable toward the retail country-of-origin label because of their tendency to eat outside the home more frequently and their greater use of convenience foods. The opposite effect might be expected for the restaurant model.

The sign of the variable "no farm relationship" was considered to be indeterminate. This group of respondents would have little knowledge of beef beyond the meat case. While as meat consumers they could be expected to want information on the source of beef in stores and restaurants, they may also consider beef to be a commodity and unaffected by location of production.

Results

The surveyed households returned 381 questionnaires (a 19.1-percent return). After the returns from respondents who did not consume beef or failed to complete one or more portions of the questionnaire were removed, 337 usable surveys were available for analysis. This rate of return is generally characteristic of responses from unsolicited mail surveys, especially when bulk-mail postage is used. Means of the dependent variables used in the probit analysis are given in Table 2. As shown in Table 2, the actual sample was somewhat biased toward higher-educated, older, higher-income, or Caucasian categories of the Louisiana population. The actual sample had a larger proportion of college-educated consumers and a smaller proportion of consumers with less than a high school education than the population as a whole, and the actual sample averaged about 10 years older than the popu-

Table 2. Responses of the Household Sample, Country-of-Origin Labeling of Fresh or Frozen Beef, Grocery Stores and Restaurants, Louisiana, 1999.

Category	Percent		Category	Percent	
	State*	Sample		State*	Sample
Sex			**Racial Composition**		
Male	48.1	43.3	Asian	0.7	0.0
Female	51.9	56.7	African-American	27.1	10.4
Education			Hispanic	0.4	0.9
<High School Education	31.7	4.5	Caucasian	71.3	85.8
High School Education	31.7	36.5	Other	0.5	3.0
Some College Education	20.5	26.4	**Employment Status**		
College Education	10.5	18.4	Employed	56.0	53.4
Post Graduate Education	5.6	14.2	Unemployed	5.1	2.4
Residence			Student	N/A	11.3
Rural	32.1	23.1	Homemaker	N/A	30.6
Town (500–2,500)	N/A	14.5	Retired	N/A	2.3
Large Town (2,501–25,000)	N/A	10.1	**Age**		
Small City (25,001–100,000)	N/A	11.3	Mean (Years)	43.5	52.9
Med City (100,000–500,000)	N/A	31.5	**Relationship with Agriculture**		
Large City (>500,000)	N/A	9.5	Farmer	N/A	5.0
Household Status			Parents are Farmers	N/A	20.5
Single Adult	33.7	17.8	Close Relative is Farmer	N/A	15.1
Single Parent w/ Children	N/A	4.2	Friends/Business w/ Farmers	N/A	10.4
Couple w/o Children	N/A	41.5	No Relationship with Farmers	N/A	49.0
Couple w/ Children	N/A	35.6	**Purchase Domestic Durables**		
Other	N/A	0.9	No Distinc betw Dom & Imp	N/A	25.2
Income			Purchase U.S. Product	N/A	46.0
<$15,000	28.6	11.3	Pay More for U.S. Product	N/A	28.8
$15,000–$29,999	27.3	17.2	**Domestic vs Imported Beef**		
$30,000–$44,999	20.4	19.0	Domestic Beef Better	N/A	85.8
$45,000–$59,000	11.6	19.9	No Difference	N/A	14.2
$60,000–$74,999	5.7	11.9	**Read Nutrition Labels**		
$75,000–$89,999	3.4	9.5	Regularly	N/A	54.6
$90,000–$105,000	3.0	6.8	Occasionally	N/A	41.5
>$105,000	↓	4.4	Do not read	N/A	3.9

*Available for only selected categories from Louisiana Population Data Center, Department of Sociology, Louisiana State University, Baton Rouge. N/A = Not applicable or not available.

lation. Sample proportions were larger in higher-income and smaller in lower-income categories than the population. African-American consumers were under-represented (15 percent) in the sample by about the same proportion as Caucasians were over-represented.

Approximately 86 percent of the respondents rated U.S. beef superior to imported beef (Table 3). The primary reason was the expected higher quality of U.S. beef. A second important reason was concern with the purity, safety, and potential presence of disease in imported beef. The remaining 14 percent rated U.S. and imported beef equally. The primary reason for the latter was the belief that the U.S. government assures the wholesomeness and cleanliness of beef from both sources.

Nearly 88 percent of respondents favored country-of-origin labeling of beef in restaurants (Table 3). The reasons given were only entrees containing U.S. beef would be ordered (54.2 percent), only

Table 3. Reasons for Consumers Rating U.S. Beef Either Superior or Equal to Imported Beef and Reasons For or Against Restaurants Having to Label Fresh Beef, Louisiana, 1999.

Reason	Percentage
U.S. Beef Rated Superior to Imported Beef	85.8
Concern with purity of imported beef	46.0
Concern with safety of imported beef	50.9
Concern with imported beef carrying disease	46.7
U.S. beef of higher quality	74.7
U.S. Beef Rated Equal to Imported Beef	14.2
U.S. and imported beef often mixed so must be equal	23.9
Both U.S. and imported beef of equal quality	13.0
U.S. Government assures wholesomeness and cleanliness of both	63.1
Restaurant Beef Should be Labeled by Country-of-Origin	87.8
Won't patronize restaurants handling imported beef	31.0
Will eat only U.S. beef on the menu	54.2
Would patronize restaurants handling imported beef	5.3
Other	9.5
Restaurant Beef Should Not be Labeled by Country-of-Origin	12.2
Origin of beef is of no interest to me	10.2
Trust restaurant to serve only safe, quality beef	25.6
Expect restaurant to serve only best beef available	30.8
Trust U.S. government to ensure wholesomeness and cleanliness of both	30.8
Other	2.6
Desired Label Location	
On each package (Grocery store)	87.8
On menu by entree (Restaurant)	85.1
Sign over meat case (Grocery store)	10.7
Sign near entrance (Restaurant)	13.1
Both of above (Grocery store)	1.5
Both of above (Restaurant)	1.8

restaurants serving U.S. beef would be patronized (31 percent), and only restaurants serving imported beef would be patronized (5.3 percent). The 12 percent not favoring restaurant labeling felt that restaurants would get the best beef available (30.8 percent), the U.S. government would ensure that imported beef was equal to U.S. beef (30.8 percent), the restaurant's desire to maintain its reputation would assure it serves only safe quality beef (25.6 percent), or the origin of beef was of no concern (10.2 percent).

How did respondents want to be informed of the geographic source of beef? For grocery store products, consumer choices were "label on each package" (87.8 percent), "sign over the meat case" (10.7 percent) or "both" (1.5 percent). Restaurant labeling choices were "an individual label on menu beside entree" (85.1 percent), "sign inside the restaurant" (13.1 percent) or "both" (1.8 percent).

A total of 92.6 percent of the respondents favored the label requirement for grocery stores. Marginal effects are also provided. Probit results for the grocery store are given in Table 4. The overall model was significant, based on a chi-squared test with 16 degrees of freedom. The model correctly predicted the dependent variable 93.5 percent of the time. McFadden's Likelihood Ratio Index value was 0.25, discussed by Greene (2000) as an analog to the R^2 in conventional regression. Multicollinearity was checked using correlation coefficients, variance inflation factors, and Condition Indexes. Except for the expected collinearity between age and age-squared, no evidence of multicollinearity was found. Eight of the indepen-

Table 4. Coefficients, Standard Errors and P-values of Factors Influencing Household Acceptance of Mandatory Country-of-Origin Labeling of Fresh or Frozen Beef in Grocery Stores, Probit, Louisiana, 1999.

Variable	Coefficient	Std Error	Probability	Marginal Effect	Probability
Constant	3.4979*	1.3132	0.0077		
Choose Domestic Durable Products	0.9397*	0.2856	0.0010	0.0569*	0.0043
Domestic Beef Safer Than Imported Beef	0.9358*	0.2771	0.0007	0.0567*	0.0026
Domestic Beef Higher Quality	0.1369	0.2743	0.6176		
Read Nutrition Labels	0.1016	0.2616	0.6978		
Male	-0.4924*	0.2789	0.0775	-0.0298*	0.0998
Age	-0.0915*	0.0526	0.0819	-0.0055*	0.0773
Age-Squared	0.0007	0.0005	0.1319		
Household Head Single	-0.6281*	0.3104	0.0430	-0.0380*	0.0590
Children in Household	-0.8313*	0.3214	0.0097	-0.0503*	0.0180
College Education	0.2039	0.2999	0.4966		
Homemaker in Household	-0.0237	0.4931	0.9616		
Caucasian	-0.3681	0.3335	0.2698		
Rural and Small Town	0.7717*	0.3359	0.0216	0.0467*	0.0260
Large City	-0.2784	0.3964	0.4826		
Family Income >$45,000	0.0846	0.3050	0.7816		
No Farm Relationship	0.5810*	0.2767	0.0357	0.0352*	0.0399

* Significant at 10-percent level or better. Chi-Square = 42.966 16 df; 0.0003-significance level.
The Dependent Variable used was: *Do you favor compulsory country-of-origin labeling of fresh or frozen beef in food stores?* See Table 1.

Table 5. Coefficients, Standard Errors and P-values of Factors Influencing Household Acceptance of Mandatory Country-of-Origin Labeling of Fresh or Frozen Beef in Restaurants, Probit, Louisiana, 1999.

Variable	Coefficient	Std Error	Probability	Marginal Effect	Probability
Constant	-0.6356	0.8962	0.4782		
Choose Domestic Durable Products	0.5285*	0.2182	0.0154	0.0830*	0.0168
Domestic Beef Safer Than Imported Beef	0.4091*	0.2027	0.0435	0.0643*	0.0423
Domestic Beef Higher Quality	0.4930*	0.2070	0.0172	0.0774*	0.0170
Read Nutrition Labels	0.2306	0.2125	0.2778		
Male	-0.4371*	0.2231	0.0502	-0.0686*	0.0460
Age	0.0534	0.0342	0.1181		
Age-Squared	-0.0006*	0.0003	0.0794	-0.0000*	0.0795
Household Head Single	-0.1793	0.2601	0.4906		
Children in Household	-0.1020	0.2507	0.6841		
College Education	-0.3984*	0.2354	0.0905	-0.0626*	0.0915
Homemaker in Household	-0.3433	0.3460	0.3211		
Caucasian	0.2638	0.2662	0.3216		
Rural and Small Town	0.0317	0.2432	0.8964		
Large City	-0.2344	0.3432	0.8964		
Family Income >$45,000	0.0935	0.2479	0.7060		
No Farm Relationship	-0.0200	0.2138	0.9255		

* Significant at 10-percent level or better. Chi-Square = 43.872; 16df; 0.0002-significance level.
The dependent variable used was: *Do you favor restaurants being required to label the country-of-origin of fresh or frozen beef used in their meals?* See Table 1.

dent variables were significant at the ten-percent level for the grocery-store-label requirement (choose domestically produced durable products, rate domestic beef as safer than imported beef, male, age, single household head, children in household, rural, and no farm relationship). Each of the significant variables had the hypothesized sign. Households with single heads, children present, older heads, responding males or a farm relationship were more negative to the label requirement. Two variables that are usually important in a probit analysis are education and family income; however, these were not significant in explaining household reaction to a potential grocery store country-of-origin label requirement.

The binomial probit results for the restaurant model are presented in Table 5 along with the marginal effects. The overall model was significant, based on a chi-squared test with 16 degrees of freedom. The model correctly predicted the dependent variable approximately 88 percent of the time. The McFadden Likelihood Ratio Index value was 0.18. A smaller number of factors were significant in explaining respondent reaction to country-of-origin labeling of fresh or frozen beef in restaurants than in grocery stores. Six variables were significant (choose domestically produced durable products, rate domestic beef safer than imported beef, rate domestic beef of higher quality than imported beef, male, age-squared, and college education). Except for the college education variable, these variables had the hypothesized signs, which were consistent with the grocery model. The negative sign on the education variable could possibly be explained by the unusual frequency of eating out by college educated persons and, hence, an increased confidence in restaurants. The magnitudes of the marginal effects of these variables differed little from those of the grocery model, indicating similar increases in the probability of country-of-origin labeling support for both grocery and restaurants. Age, presence of children, single household head status, rural household location, and no farm relationship were not significant for restaurants but were for grocery stores. Age-squared and college education were significant for restaurants but not for grocery stores. Again, family income was expected to be an important variable but was not.

Implications

This survey found greater support for required country-of-origin labeling of fresh or frozen beef than did the Wirthlin Worldwide national survey (an average of 90.3 percent approval for this survey versus 76 percent approval reported by Wirthlin). This larger approval rate may reflect a genuinely higher approval of the label among Louisiana residents. The Louisiana Legislature approved an import labeling requirement for grocery stores in 1981, which was subsequently ignored after a 1982 hearing sponsored by the USDA. As previously noted, Louisiana passed a replacement law in mid-1999. An early 1999 telephone survey of a sample of Louisiana beef processors, meat wholesalers, specialized meat markets, grocery stores and restaurants indicated that 82 percent approved of the mandatory country-of-origin labeling of fresh or frozen beef marketed in grocery stores and restaurants (Schupp and Gillespie 2000). These surveys indicate that the mandatory country-of-origin labeling of fresh or frozen beef is strongly supported by both handlers and consumers in Louisiana.

Consumers appeared to be somewhat less interested in the country-of-origin labeling of fresh beef served in restaurants than sold in grocery stores. Consumers appear to have more confidence in restaurants than in grocery stores handling safe, high quality beef products. Since consumers consume prepared beef in restaurants, the restaurant must provide a satisfactory product or the consumer will not make repeat purchases. With some exceptions,[1] restaurants typically provide their customers little information on the origin of the entrees being served; therefore, consumers dining out are used to having less product information and are more concerned with presentation, atmosphere, and service.

Consumers who prefer domestic durable products also appear to want information on the origin of fresh or frozen beef. Buyers of domestically-produced automobiles and trucks, household appliances, mechanics tools, and other types of durable

[1] Some restaurants indicate that they handle only Certified Black Angus Beef or other similar types of beef, which would imply only U.S.-beef use. A statement that the restaurant only uses USDA Choice or Prime Quality Grade beef does not necessarily connote U.S.-produced beef because some Canadian beef is quality-graded in U.S. plants.

goods appear also to be interested in consuming domestically produced fresh or frozen beef. These consumers could be categorized as being very loyal to U.S. products (displaying ethnocentrism).

As expected, consumers who rated U.S.-produced fresh beef safer than imported fresh beef also favored the country-of-origin labeling of fresh or frozen beef in both grocery stores and restaurants. Since 85.8 percent of the respondents rated U.S. beef superior to imported beef, the imposition of a country-of-origin label on fresh or frozen beef would likely increase the demand for domestic beef relative to imported beef.

Why were education and income not significant for grocery stores and income for restaurants? A possible explanation is the bias in the sample toward the more educated and higher income consumer segments of the population, as explained in the discussion of the data.

What insights could beef producers and processors derive from this study?

- Louisiana consumers classify U.S. beef as being superior in quality to imported beef. The cattlemen's emphasis on producing a genetically superior animal, the beef industry's attention to the feeding and management of the animal during the production process, the value-enhancing procedures used by the processing segment, and the consumer-oriented packaging and presentation techniques used by retailers have combined to produce a highly acceptable product relative to imports. A country-of-origin label could assist the U.S. beef industry in capitalizing on the value it adds to the product.
- Louisiana consumers remain unconvinced by USDA insistence that the industries and governing bodies in countries approved to export fresh beef to the U.S. follow the same procedures and regulations required of the U. S. beef industry. They are concerned with potential problems with the purity, safety- and disease-carrying potential of imported beef. The sporadic spread of foot-and-mouth disease into new areas can only serve to increase these concerns. The U.S. beef industry could push for the label to allay some these concerns and fears.
- Male consumers are less inclined to favor the country-of-origin label. This may reflect their overall lower knowledge of and/or concern for food and nutrition issues. With the traditional roles of the male and female in the household becoming less distinct and the large tendency for many to eat outside the home, the industry may need to place more emphasis on male consumers than it has in the past.

Households with a single head or with children present appear to be less interested in the country-of-origin labeling of fresh or frozen beef than their counterparts. The beef industry may need to devote some of its checkoff funds to help educate these consumers about the attributes of U.S. beef if the country-of-origin label becomes reality.

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