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Handler Reactions to Potential Compulsory Country-of-Origin Labeling of Fresh or Frozen Beef

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ABSTRACT

Interest in mandatory county-of-origin labeling of fresh meats exists at both the state and national levels. A sample of beef handling firms in Louisiana (processors, retailers and restaurants) was surveyed by telephone to identify the characteristics of these firms that would help explain their decision to support or reject the law. A factor supporting the label use was a belief that the label is valuable to buyers. Negative factors were that the firm is a restaurant, is part of a chain or franchise, or has experience handling imported beef, and the belief that labeling merely reflects more government interference in free trade.

Key Words: *beef handling firms, country-of-origin labeling, logit analysis, telephone survey.*

Recent proposed legislation at the national and state levels has called for country-of-origin labeling of fresh or frozen beef. Laws requiring such labels would affect meat handlers including processors, wholesalers, brokers, grocery retailers, meat markets, and a number of food service outlets such as restaurants, caterers, and various public and private institutions, The laws would also affect consumers. The businesses would be required to keep records of the country-of-origin of meat and label product or packages accordingly. This study addresses two questions: Would meat handlers favor such legislation? Which handlers would more likely support it?

In 1998, approximately 14 percent of the total United States beef supply was imported in live or meat form, primarily from Australia, Canada and New Zealand (GAO). Total U.S. fresh or frozen beef imports in 1998 were 822,883 metric tons (USDA-ERS). Live imports consisted of 2,034,009 head of cattle and calves, of which 1,343,476 head were from Canada (USDA-ERS). Brester, Marsh and Smith estimate that approximately 75 percent of these Canadian live imports consisted of fed steers and heifers. What proportion of the total U.S. beef imports consists of intact cuts and are, thus, saleable as steaks, roasts, etc.? While information on this is limited, testimony of Caron Wilcox (then Deputy Under Secretary for Food Safety—USDA) before the U.S. Congress indicates that intact muscle cut quantities would be limited to beef imports from Canada (live and carcasses) along with 235 million pounds of other beef imports

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(comprising approximately 1 percent of the total U.S. beef supply in 1998). The remainder consists of beef which is normally used in a ground product or is processed before sale to the consumer (Committee on Agriculture).

While the Tariff Act of 1930 requires all fresh or frozen beef imported into the U.S. to be labeled as to country-of-origin, the label need not accompany the product after it has been repackaged (Becker). This essentially means that all bulk imported fresh or frozen beef simply becomes an indistinguishable part of the total U.S. beef supply when it is sold to the first buyer. Beef handlers, including grocery stores and restaurants, are not required to specify to subsequent buyers whether the fresh or frozen beef they handle is U.S. produced or imported.

Becker discusses a number of arguments for and against country-of-origin labeling of fresh or frozen beef as it moves through the marketing chain. Arguments for country-of-origin labeling include:

(1) Labeling requirements would give U.S.-produced products a competitive advantage, assuming consumers will choose fresh domestically produced products if offered a choice.
(2) U.S. consumers have a right to know where their food originates. This information would be particularly useful when specific food safety problems are linked to imported foods.
(3) The industry's costs of compliance are minimal.
(4) It is unfair to exempt certain agricultural products (i.e., fresh meats) from country-of-origin labeling requirements.

Critics argue that:

(1) The label is a thinly disguised protectionist trade barrier deliberately intended to increase costs for importers and foster the unfounded perception that foreign products are inherently less safe than U.S. products.
(2) Labels would undermine U.S. efforts to break down other countries' trade barriers and expand international markets for U.S. products.
(3) Industry compliance and government implementation costs would be high.

Proponents have advocated mandatory labeling while opponents have opted for all source labeling to remain voluntary. The former would require legislation at either state or federal levels.

The wide publicity given to the outbreak of *Bovine Spongiform Encephalopathy* (*BSE*) in Europe may have increased the preference for mandatory country-of-origin labeling of fresh or frozen beef in the U.S. Currently, U.S. consumers do not have the information needed to distinguish between beef produced in the U.S. and in countries which have BSE and other problems associated with their beef supplies. Successful implementation of this labeling requirement, however, would appear to depend somewhat on its support among the various types of beef handlers who must bear (at least initially) the costs of labeling and the responsibility of compliance.

The objectives of this research are (1) to assess potential support among beef handlers in Louisiana for compulsory country-of-origin labeling of fresh or frozen beef throughout the beef marketing channel and (2) to identify the types of firms that are most likely to support country-of-origin labeling.

Background and Literature Review

A number of countries have compulsory country-of-origin labeling requirements for fresh or frozen meats that extend from the importer to the retail level. The Foreign Agricultural Service estimates that 32 countries, including Canada and Mexico, require country-of-origin labels at the retail level for perishable agricultural products (Committee on Agriculture). Japan also has a country-of-origin labeling requirement, and U.S. beef exporters use this to their advantage in selling U.S. beef in that country (Committee on Agriculture).

The Fair Trading Act of 1986 requires that most products entering the U.S. and destined for direct purchase by consumers be labeled by country-of-origin for customs verification. A number of products were exempted from this Act, however, including fresh meats, hides, skins and leather.

Legislation calling for the mandatory country-of-origin labeling of fresh and frozen beef has been introduced into the U.S. Congress on numerous occasions. Until the 1997 session, however, none of these bills had been considered, even by a legislative committee. During the 1997–98 Congressional session, an amendment covering the compulsory country-of-origin labeling of fresh and frozen beef was approved in the U.S. Senate and attached to the Omnibus Consolidated and Emergency Supplemental Appropriations Bill. Later, the amendment was defeated in the U.S. House. Congress directed the USDA to study the potential effects of mandatory country-of-origin labeling to the retail level for imported fresh cuts (such as steaks and chops) of beef and lamb (GAO). The USDA report was released on January 12, 2000.

Legislators in at least two states, Kansas and Louisiana, have recently introduced bills that involved the country-of-origin labeling of beef. In Louisiana, a 1981 law required all imported beef sold in Louisiana grocery stores and meat markets to be labeled as such on the packages (Louisiana Secretary of State). The USDA organized a hearing on the law in June, 1982, where USDA representatives testified against it. No evidence exists that the law was declared unconstitutional after the hearing, but it was never enforced. However, during its 1999 session, the Louisiana Legislature again passed a labeling law similar to the 1981 law, which was to take effect on January 1, 2000. The Kansas Legislature passed a resolution in 1999 urging the U.S. Congress to require country-of-origin labeling on meat and dairy products raised and produced in other countries (Kansas Legislative Services).

Beef is not the only perishable food commodity seeking country-of-origin labeling in the U.S. Tomato producers, especially those located in Florida, have sought support for country-of-origin labeling of tomatoes, as tomato imports have increased greatly since passage of the North American Free Trade Agreement (Hawkins). The American Alliance for Honest Labeling has also lobbied the U.S. Congress to impose a country-of-origin label on all imported frozen produce (Robinson).

A 1998 consumer survey by Wirthlin Worldwide indicates that 76 percent of consumers would approve of the U.S. requiring meat labels that indicate the country-of-origin of fresh beef (Committee on Agriculture). Furthermore, when offered a choice between retail beef packages with labels that read "Product of the United States" or "Imported Product," 91 percent of consumers chose the domestic beef.

Several studies have shown that consumers favor location-of-production labels on food products and that a sizeable number of consumers would pay a price premium for this labeling. For example, based on a mail survey, Schupp and Dellenbarger found that 74 percent of Louisiana consumers were willing to pay equal or higher prices for catfish labeled as Louisiana farm-raised than catfish being sold nationally as Mississippi farm-raised catfish. In another study, a popular beef product produced in Alberta was compared with a similar beef product produced elsewhere in Canada (Quagrainie, Unterschultz and Veeman). Based on a mail survey, Western Canadian consumers preferred the beef product from Alberta over other Canadian beef products. The price of the non-Alberta produced Canadian product had to be reduced, on average, by 15 percent so that consumers would be indifferent to the two sources. A third example involves a comparison of preferences of Canadian (Alberta) consumers between Canadian and U.S. beef products with the former preferred (Unterschultz *et al.*). These results imply that meat handlers can effectively use product origin as a means of differentiating products.

In 1999, 23 states had established promotional programs for specific types of agricultural products produced in their states (Patterson *et al.*). An analysis of the *Arizona Grown* promotion program (initiated in 1993) conducted in early 1997 indicated that only 23 percent of the respondents to the survey were aware of the program. Nevertheless, 75 percent of the respondents indicated that they preferred Arizona products over products from other states. Analysis of an in-store promotion program in several grocery store chains for selected produce and fruit items showed that purchases of only two products (baby carrots and broccoli) were increased by the *Arizona Grown* promotion program.

Almonte *et al.* reviewed the country-of-origin literature in 1995 as it relates to food products. They hypothesized that growing concerns about the safety, health and nutritional aspects of foods would impact product country images and lead to more demand for information as to the country-of-origin of foods. They asked a sample of higher-income Mexican consumers to evaluate both Mexico- and U.S.-produced chile salsa and potato chips. The respondents preferred Mexican-produced chile salsa and U.S. produced potato chips, indicating that consumers tended to favor those products which a country has a reputation for producing.

Nagashima examined the attitudes of samples of business leaders in the U.S. (230) and Japan (100) to products made in the U.S., Japan, England, Germany, and France in 1965–67. Japanese businessmen considered U.S. products as high cost, technically advanced, innovative and highly recognized. U.S. businessmen considered Japanese products as inexpensive, technically advanced, mass produced, and distributed worldwide. English products were perceived as expensive, prestigious, and well known. German products were considered reliable, prestigious, and high performing. French products were considered exclusive, handmade, luxurious, and unreasonably priced.

Skaggs *et al.* discuss product-country images (stereotypes) which help to explain buyer behavior with respect to imported products. In the halo model, country images influence buyer beliefs about product quality when the buyers are unfamiliar with products from a particular country. If the buyer has a positive image of the country, the buyer is also likely to have a positive attitude toward the unfamiliar product from that country. A second theory is the summary construct model, which implies that buyers infer product information directly from country image instead of indirectly through product attribute ratings. For example, if buyers prefer a particular type of processed ham from Denmark, they are likely to initially like all types of Danish processed hams and, moreover, most food products from Denmark. The authors also discuss ethnocentrism (the attitude that one's own group is superior to others) and nationalism (the buyer's sense of nationalism assumes patriotic emotions have significant effects on attitudes and purchase decisions) as explanations for the role of country images on imports from these countries. The latter are very useful in explaining the value of state or local commodity group promotion programs.

Information on quality, price, safety, or other real or perceived differences between imported and domestic products would appear to be needed for a country-of-origin label to be beneficial to potential buyers. Norum and Clark examined the differences in quality and/or price of domestically produced and imported women's blazers. They found no significant differences, indicating that a country-of-origin label would be of little value for this product.

Data and Methods

Survey Instrument. A number of methods (personal, mail, phone or internet surveys) could be used to collect the data needed for this study. Each of these methods has strengths and weaknesses (see, for example, Oakes; Payne; Dillman; and Branson and Dillin). Given the data requirements, resources available, and time constraints of this study the phone interview technique was selected.

For purposes of this study, three categories of firms were recognized as beef handlers: (1) slaughter/processors; (2) meat wholesalers, grocery stores and specialized meat markets; and (3) restaurants. Two questionnaires (one for processors, wholesalers, meat markets and retailers; and a second for restaurants) for use in the phone interviews were developed, reviewed and revised. Questionnaire layout, question development, telephone procedures and other components of survey instrumentation and delivery benefitted greatly from Dillman. Both personal contacts and phone trials were used to test the two instruments and to suggest improvements. The intent of the testing was to devise an appropriate phone questionnaire that would require no more than six minutes to complete.

In addition to questions pertaining to the firm's use and assessment of imported beef relative to U.S. produced beef, its attitude toward compulsory country-of-origin labeling, and whether the firm could pass its costs of complying with the labeling requirement along to the next buyer, the firm's spokesperson also provided information on firm size, age and organization (independent, chain or franchise). These items were included to help differentiate the firms in the quantitative analysis.

Sampling Statistics. Names, addresses and phone numbers of firms for the two questionnaires were obtained from three sources. The entire population of slaughter/process firms in Louisiana was obtained from the Louisiana Meat Inspection Service with all custom slaughter plants excluded because they do not purchase or sell meat. A list of Louisiana meat wholesalers, grocery stores and specialized meat markets was obtained from *American Business Information, Inc.* Firms were excluded from this list by the authors if their names indicated that did not appear to handle beef. Two lists of restaurants were obtained, restaurants with sales of more that one million dollars from *The Food Service Database Company* and other restaurants from *American Business Information, Inc.* Fast food restaurants were excluded since most are members of chains or franchises whose corporate headquarters are not in Louisiana. The local Louisiana restaurant manager usually has no knowledge of the origin of beef purchases since the local restaurant obtains its beef from the corporate organization. Again, the authors excluded from the list any restaurant whose name suggested that it did not handle beef. The lists obtained from the two commercial business database firms do not represent populations; however, the firms attempt to keep their lists current and representative. Since many of the firms surveyed were members of regional or national chains or franchises, they are likely to be representative of the southern U.S.

Logistic Regression Analysis. Binomial logit analysis was used to analyze why some firms would be more likely to favor the labeling legislation than others. 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 logit distribution is inherently heteroskedastic, the most suitable estimation technique is maximum likelihood which also assures the large sample properties of consistency and asymptotic normality of the parameter estimates (Capps and Kramer, 1985). The specification of the logit model follows in (1) (Greene):

$$\text{(1)} \qquad \text{PR}(Y = 1) = \frac{e^{\beta' x}}{1 + e^{\beta' x}} = \Lambda(\beta' x)$$

where Pr represents probability, Y is the value of the dependent variable, x is a vector of independent variables and β is a vector of parameters to be estimated.

The maximum likelihood coefficients estimated through logit have no direct interpretation other than indicating a direction of influence on probability. The calculated changes in probabilities indicate the magnitude of the marginal effects and refer to the partial derivatives of the nonlinear probability function evaluated at the zero and 1 values of the independent variables. The marginal effects for the logit model are estimated as (2) (Greene):

$$\text{(2)} \qquad \frac{\partial E[y|x]}{\partial x} = \Lambda(\beta' x)[1 - \Lambda(\beta' x)]\beta$$

As discussed in Greene (p. 817), the appropriate marginal effect for a binary (dummy) independent variable is (3):

$$\text{(3)} \qquad ME_B = \Pr[Y = 1|\bar{x}_*, d = 1] - \Pr[Y = 1|\bar{x}_*, d = 0]$$

where ME_B denotes the marginal effect of a dummy variable, $\bar{x}_*$ denotes all other independent variables held at their mean values, and

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

Independent Variable	Exp Sign	Definitions
Firm is Retail Outlet	Neg	1 if firm is a retailer; 0 otherwise
Firm is a Restaurant	Neg	1 if firm is a restaurant; 0 otherwise
Firm Has Experience Handling Imported Beef	Neg	1 if firm is handling or has handled imported beef; 0 otherwise
Buyers Want Country-of-Origin Knowledge	Pos	1 if customers want knowledge of whether beef is imported; 0 otherwise
Firm Believes Country-of-Origin Knowledge is Valuable	Pos	1 if firm believes labeling would be of value to customers; 0 otherwise
Label Requirement only Represents Gov't Interference	Neg	1 if firm believes that label would only represent an interference in commerce; 0 otherwise
Label Hints at Problem with Imported Beef	Pos	1 if firm believes that label would represent a potential problem with imported beef; 0 otherwise
Firm Size (# Full-Time Employees)	Pos	Continuous
Firm Age (Years)	Neg	Continuous
Part of Chain or Franchise	Neg	1 if firm is not independently owned; 0 otherwise

Dependent variable is "My firm favors mandatory country-of-origin labeling of fresh and frozen beef at all stages of the marketing channel." Yes = 1 and No = 0.

d denotes the value of the dummy variable. In this study, (2) is used to estimate the marginal effects of all continuous independent variables and (3) is used to estimate the marginal effects of all dummy independent variables.

The dependent variable selected for the logit analysis was, "Would your firm favor mandatory country-of-origin labeling of fresh and frozen beef at all stages of the marketing channel?" A positive response to this question indicates that the firm's spokesperson believes that this requirement would be beneficial to the firm and/or industry.

Variables, Definitions and Expected Signs. Definitions of the independent variables used in the logit analysis are provided in Table 1 along with their expected signs relative to the dependent variable. While past studies have suggested consumer preference factors which could be useful in analyzing consumer preferences for country-of-origin labeling (see, for example, Quagrainie, Unterschultz, and Veeman; Howard), the authors are unaware of any studies useful in providing comparable preference factors for analysis of handler preferences for such labels.

Food retailers were expected to be less favorable toward the labeling requirement than processors and wholesalers because the labeling requirement would require them to perform more labor-intensive operations and/or would also reduce their option of freely substituting between imported and domestic beef, depending on prices. Retailers would be forced to keep track of the country-of-origin of individual packages of beef. Restaurants might encounter consumer resistance if their use of imported beef became widely known. Thus dummy variables indicating the firm was a restaurant or a food retailer were included in the model.

A history of past or current use of imported beef would likely be negatively related with firm approval of country-of-origin labeling of fresh and frozen beef because of expected changes in marketing practices with a labeling law. A mandatory country-of-origin label requirement would force these firms to differentiate products which had previously been considered homogeneous. Thus a dummy variable indicating the firm's current or previous use of imported beef was included in the model.

A handler's expectation that buyers would have a strong desire for the knowledge provided by these labels was hypothesized to be positively related with a positive firm assessment of labeling. Addition of the label could lead to an increase in demand for the seller's product; thus firms believing that the labels would provide information of high value to their customers were expected to favor labeling. A dummy variable was used to measure this relationship.

Firm spokespersons classifying labels as likely to be perceived by their customers as indicating a potential problem with imported beef, or as merely representing an unwarranted government interference with free trade and commerce were expected to not favor the labeling law. Consumers who are unconcerned about product origin could interpret the sudden appearance of the label on fresh beef packages as representing a warning signal, reducing their consumption of beef. Some firm managers could be resentful of any government regulation or directive that increases their costs or infringes on their entrepreneurial freedom. Thus dummy variables indicating whether the firm felt that labeling would convey the message that a potential problem exists with imported beef and whether the requirement only represented additional government interference were included.

Larger firms were expected to be more likely to support labeling because it could give them a competitive advantage relative to smaller firms that would likely have to choose either domestic or imported beef, but not both. Firms able to offer more products provide greater choice and, thus, have the opportunity to reach more buyers. A continuous variable measuring firm size in terms of the number of full-time employees employed by the firm was included.

Acceptance of country-of-origin labeling was expected to be lower among older firms as these firms may be more confident that their established reputation among consumers would provide the assurance consumers needed. Thus a continuous variable measuring firm age was included.

Label resistance was expected to be higher among firms that are parts of chains or franchises because of their purchases of beef from a larger number of sources. Labeling could potentially increase their costs relative to independents that might decide to purchase either domestic or imported beef, but not both. As well, the individual firm would likely have little or no control over the country-of-origin of the beef. Thus a dummy variable indicating if the firm was part of a chain or franchise was included.

Results and Discussion

Firm spokespersons (usually the meat buyers) were interviewed by telephone during January–April, 1999. The actual phone surveys were conducted by the authors and an undergraduate student supervised by the authors. Firm cooperation was excellent once the meat buyer or firm manager was located and that person was free to respond to the questionnaire. On average, approximately 27 percent of the firms in each of the categories were contacted with about 3 percent being out of business, not handling beef, too busy to cooperate or unable to participate in the survey for other reasons. A total of 49 restaurants, 66 grocery stores, wholesalers and meat markets, and 17 slaughter/processors participated in the study.

Means and standard deviations for the variables used in the logit analysis are given in Table 2. *Eighty-two percent of the respondents indicated that their firms would approve of the mandatory labeling law.* Only 8 percent of the firms were currently handling or had previously handled imported beef. Approximately 42 percent of the firms believed that their customers would respond positively to the label's presence. Not surprisingly, 30 percent of the respondents felt that the label would be just another example of unneeded and undesirable interference by government in free trade and commerce. Nearly 70 percent of the respondents felt that the label would imply some problem with imported beef relative to domestic beef.

The handlers also responded to a question that was not included in the logit analysis but is useful in interpreting the handler's reaction to the proposed labeling legislation. When asked "Do you believe you could recover the added costs that the firm would incur in com-

Table 2. Means and Standard Deviations of Variables Used in the Logit Analysis, Country-of-Origin Labeling of Fresh and Frozen Beef, Louisiana, 1999

Variable	Mean	Standard Deviation
Firm Supports C-O-O Labeling (The Dependent Variable)	0.8182	0.3872
Firm is a Retail Outlet	0.5000	0.5000
Firm is a Restaurant	0.3636	0.4810
Firm has Experience Handling Imported Beef	0.0758	0.2655
Buyers Want Country-of-Origin Knowledge	0.4167	0.4935
Firm Believes Country-of-Origin Knowledge is Valuable	0.7652	0.5425
Label Requirement only Represents Gov't Interference	0.3030	0.4596
Label Hints at Problem with Imported Beef	0.6970	0.4562
Firm Size (# FT Employees)	13.8400	20.1690
Firm Age (Years)	19.9200	14.9847
Part of Chain or Franchise	0.1364	0.3443

plying with a mandatory country-of-origin labeling law by increasing the price of beef?" 53 percent of the handlers answered Yes, 29 percent answered No, and the remaining 18 percent were uncertain. These results indicate that over half of the handlers were not concerned about the costs they would incur should the label requirement be imposed. While costs of the required label would initially fall on the beef handlers (lowering their profits), economic theory tells us that these costs would ultimately be borne by either the beef producer, beef consumer, or both.

Results of the logit analysis of the dependent variable "My firm favors mandatory country-of-origin labeling of fresh and frozen beef at all stages of the marketing channel" are presented in Table 3. The overall model was highly significant, based on the chi-squared test with 10 degrees of freedom. The model correctly predicted the dependent variable 89.4% of the time. As suggested by Greene as a measure of goodness of fit, the likelihood ratio index, which is the analog of the R-Square for logit models, is computed at 0.357. Examination of collinearity diagnostics did not reveal evidence of multicollinearity. No evidence of heteroskedasticity was revealed through use of a likelihood ratio test.

Four of the independent variables were significant at the 5-percent level and an additional variable was significant at the 10-percent level. All significant variables had the expected signs. Restaurant operators were significantly less favorable toward the labeling requirement than the base processors, wholesalers and brokers. Examination of the marginal effects reveals that restaurants were 30 percent less likely to favor country-of-origin labeling. Interpreting the last two columns of Table 3, the probability of a restaurant favoring country-of-origin labeling, given all other independent variables held at their mean values, was 0.67. Likewise, the probability of all other firm types favoring country-of-origin labeling, given all other independent variables held at their mean values, was 0.97. Thus, restaurants were 30 percent less likely to favor country-of-origin labeling than all other firm types.

Firms that had handled or were currently handling imported beef were significantly less favorable toward country-of-origin labeling of fresh and frozen beef than non-handling firms (28 percent less likely to favor country-of-origin labeling). Firm respondents indicating that their customers would gain valuable knowledge from the labels were significantly more favorable toward the labeling requirement. These firms were 16 percent more likely to favor labeling.

Firm spokespersons classifying the proposed legislation as being simply an unnecessary government interference in commerce or business were, as expected, less favorable toward the labeling requirement than firms with a less critical view of the role of government. Marginal analysis indicated that these firms were 28 percent less likely to favor

Table 3. Coefficients, Standard Errors, Marginal Effects and Predicted Probabilities of Factors Influencing Respondents Acceptance of Mandatory Country of Origin Labeling of Fresh Beef, Logit Analysis, Louisiana, 1999

Variable	Coefficient	Standard Error	Marginal Effect	$\Pr[Y = 1 \mid \bar{x}_{\cdot}, d = 1]$[a]	$\Pr[Y = 1 \mid \bar{x}_{\cdot}, d = 0]$[a]
Constant	−3.9112**	1.4840			
Firm is a Retail Outlet	−1.6984	1.3217			
Firm is a Restaurant	−2.7792**	1.4158	−0.3043	0.6654	0.9697
Firm has Experience Handling Imported Beef	−2.0023*	1.1259	−0.2844	0.6470	0.9314
Buyers Want Country-of-Origin Knowledge	0.6620	0.7306			
Firm Believes Country-of-Origin Knowledge is Valuable	1.4984**	0.6731	0.1557	0.9431	0.7875
Label Requirement only Represents Gov't Interference	−2.4300**	0.7036	−0.2787	0.6819	0.9606
Label Hints at Problem with Imported Beef	0.6975	0.5882			
Firm Size (# FT Employees)	0.0127	0.0186			
Firm Age (Years)	−0.0242	0.0228			
Part of Chain or Franchise	−2.2689**	0.8785	−0.3191	0.6217	0.9408

* Indicates significance at <0.10 and ** indicates significance at <0.05 levels. Chi-Square = 44.72; 10 df; 0.0000 significance level. % Correctly Predicted: 89.4. Likelihood Ratio Index: 0.357. Log Likelihood function = −40.229.

[a] Columns 5 and 6 indicate the probability that the dependent variable Y takes the value of 1, given the dummy variable of interest, d, takes the value of 1 and 0, respectively, and all other variables are held at their mean values, $\bar{x}_{\cdot}$.

country-of-origin labeling. Respondents that were parts of chains or franchises were estimated to be 31 percent less likely to favor the label than were independently owned firms.

The remaining independent variables were not significant in explaining firm attitudes toward potential country-of-origin labeling of fresh or frozen beef. The belief that buyers would respond positively to the label, the view that the label could be interpreted by buyers as hinting at problems with imported beef, and firm size and age cannot be used in interpreting the industry's attitude toward the label requirement.

Implications

This study discovered considerable interest in country-of-origin labeling of fresh or frozen beef among beef handlers. The support of these firms is critical to the success of these programs, including the new Louisiana labeling law. Their support of this program would help reduce compliance costs, which are often listed as a primary reason why the U.S. Congress has not established a nationwide label requirement.

The findings of this research indicate that potential legislation in the U.S. Congress requiring the country-of-origin labeling of fresh and frozen beef is more likely to be opposed, in general, by firms currently handling or expecting to handle imported beef, handling firms that are members of chains or franchises, firms opposed to government interference in trade and commerce, and restaurants. Whether these types of firms comprise a combined group that is of sufficient size and/or lobbying power to effectively impact future passage of this legislation at the state or national level remains to be seen. The fast food industry, heavily represented by corporate chains or franchised organizations and excluded from this study, would likely be in this group who oppose the establishment of the label.

In general, firms believing that their customers would benefit from this labeling requirement tend to favor the labeling requirement. This indicates a willingness on the part of these firms to provide information that buyers could use to reduce their search costs and perhaps would increase the consumption of domestic beef relative to imported beef.

The finding that firm size (number of full-time employees) and age were not important in explaining firm support for country-of-origin labeling was unexpected. These variables had the expected signs in the logit analysis, however. The firms apparently do not anticipate economies of scale in country-of-origin labeling and firm age did not materially influence decisions on the issue.

An issue raised by a anonymous journal reviewer is whether buyers of ground beef products are as interested in country-of-origin labeling as buyers of intact muscle cuts, such as steaks and roasts. Buyers whose interest in labeling is associated primarily with product quality would be concerned only with intact muscle cuts. However, buyers whose interest in the label involves potential bacterial, residue, contamination or other health-related problems would have an interest in labeling all forms of beef, ground and intact cuts. The current USDA data on beef imports does not separate muscle cuts from non muscle cuts, in total or by country. This study assumed that all beef would be subject to labeling, so we did not directly address this issue.

Further research on this issue might examine consumer preferences for country-of-origin labeling of beef and the potential impacts of such legislation on the domestic beef cattle industry. As mentioned previously, more accurate estimation of the costs the firms would encounter in complying with the required labels in grocery stores and restaurants is also needed, along with the costs of government in ensuring compliance by firms at all levels of the marketing channel.

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