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A Consumer Survey to Identify Marketing Issues for Natural Beef

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Introduction

The beef industry has faced many challenges in the last 20 years. Some beef producers have taken advantage of the growth in the organic food market to produce natural beef, usually from small numbers of animals. Natural beef is defined as beef produced without subtherapeutic hormones added and may use grain in the finishing ration. Producing natural beef responds to consumers' demands for a potentially healthier, better tasting product. However, little or no market research has been conducted on natural beef.

The purpose of this research was to provide recommendations for producers interested in marketing natural beef. A survey was used to gather information from consumers at retail supermarkets that sell conventional, organic, and natural food products. Using scanner data from retail supermarkets in Kansas City, we identified two groups of consumers. The first category, 'beef eaters', included those making the most weekly beef purchases. The second group, which we label the 'natural-food' group, included those buying the most organic or natural products such as hydroponic tomatoes each week. The top 500 consumers in each group were identified, and questionnaires were mailed in the summer of 1998. The overall response rate was 47.1%. Of the 471 questionnaires returned, 232 were from the beef eaters and 239 from the natural food eaters. The first step in data analysis was a descriptive statistical analysis. The second step was to analyze the correlations between different variables. Results from each group were analyzed separately and then compared to look for any significant differences. An interpretation of each result is provided.¹

Demographic Information

Most of the consumers were females, 76 and 68% for beef eaters and natural food eaters, with an average age of 44.5 and 45.1 years, respectively. The age distribution is presented in figure 1. The average level of education was 'having some college courses but no degree.' Figure 2 shows the income levels for both consumer categories. The average annual income was significantly greater for beef eaters (ranging \$70,000 to \$79,000) than for natural food eaters

¹For more information about this study, see Givry, Sébastien Richard Marie, "Consumer Preferences for Natural Beef Products." Unpublished M.S. thesis, Department of Agricultural Economics, Kansas State University, Manhattan, KS, December 1998.

(ranging \$60,000 to \$69,000). With respect to numbers of children, 67% of beef eaters and 64% of natural food eaters had at least one child in their households.

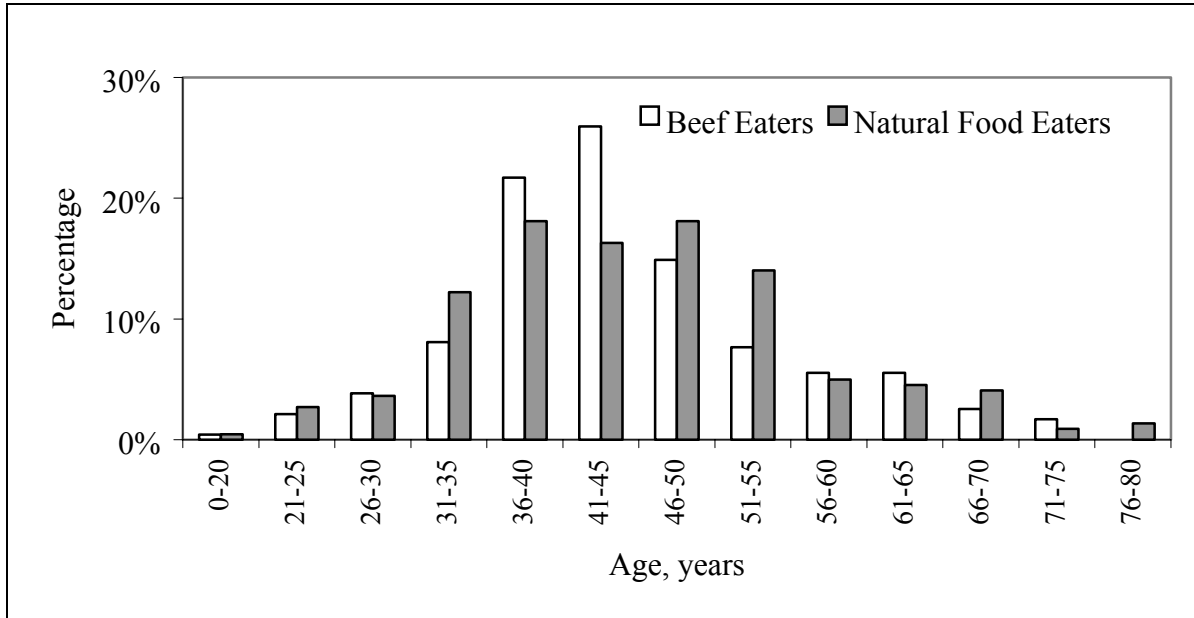


Figure 1. Age of Consumers by Category

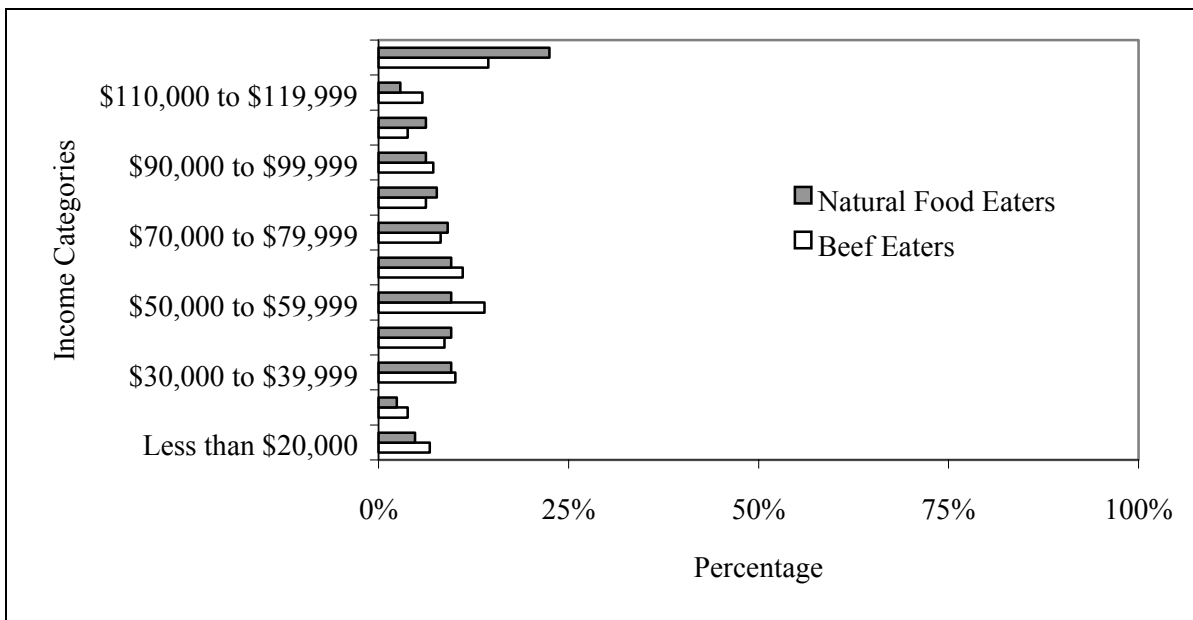


Figure 2. Income Levels of Respondents

Descriptive Statistics

In the following section, we present some descriptive statistics about consumers' consumption trends and preferences based on data collected in the survey. Means were compared using a two-tailed t-test to test the null hypothesis (H₀) against the alternative hypothesis (H_A) where

H₀: Both means are not statistically different from each other.

HA: Both means are statistically different from each other.

For all comparisons, the critical value for the two-tailed test at the .05 level of significance is 1.96 (the degree of freedom for every variable was high enough to assume the same critical value). Thus, if the observed t-test value was higher than 1.96, the null hypothesis could be rejected.

Consumer Survey Questions and Results

Question 1: How often do you eat these meat products? Beef, pork, poultry, fish. Respondents were asked to indicate their frequency of consumption using a scale from 1 to 4 where 1 equals “never”, 2 equals “once a week”, 3 equals “twice a week” and 4 equals “three or more times a week.” Table 1 shows that there were no significant differences in the consumption of any meat product between the two groups of consumers.

Table 1. Summary Statistics for Consumer Categories

Product	Beef Eaters		Natural Food Eaters	
	Mean*	Std	Mean	Std
Beef	3.35	0.75	3.39	0.74
Pork	2.18	0.66	2.26	0.67
Poultry	3.13	0.73	3.04	0.82
Fish	1.94	0.64	2.02	0.81

* Means with the same superscript letter within each column are not statistically different from each other.

However, within each group, we find that consumption levels of beef, pork, poultry, and fish were significantly different from each other: Respondents in both groups indicated that their consumption of beef was higher than that of any of the other meats.

*Question 2: When you buy meat, which type do you most often purchase?
1 = bone-in, 2 = boneless*

A large majority (85%) of consumers preferred boneless meat, and the means from the two consumer categories were not statistically different. This result suggested that convenience and packaging are important to both groups of consumers.

Table 2. Preference for Boneless and Bone-in Meat

Consumer Group	Mean	Std
Natural Food Eaters	1.85	0.35
Beef Eaters	1.84	0.36

*Question 3: When you buy beef, which type do you most often purchase?
Hamburger, Steak, other*

Consumers in both categories purchased more hamburger than steaks or other types of beef. For example, 57% of the beef products purchased by beef eaters were hamburger versus 67% by the natural food eaters. Natural food eaters had a significantly greater likelihood of consuming more steaks than beef eaters.

*Question 4: When you buy hamburger, which type do you most often purchase?
70 to 80% lean, 80 to 90% lean, more than 90% lean*

As shown in Figure 3, both populations purchased 80 to 90% lean hamburger as often or more often than 90% lean hamburger. There were no statistically significant differences between consumer groups.

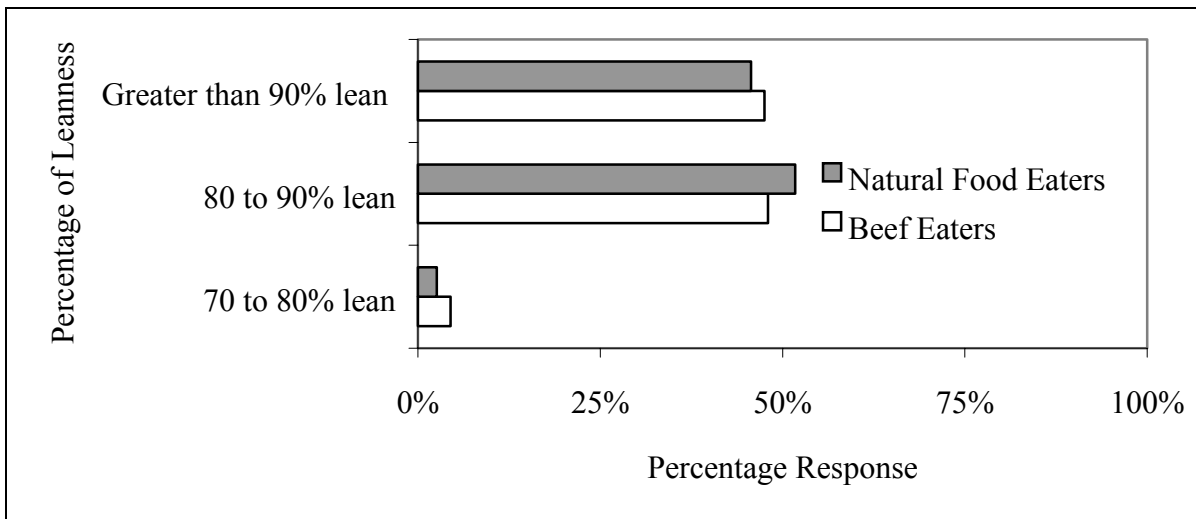


Figure 3. Preferences for Percentage of Lean in Hamburger

*Question 5: When you buy steak, which type do you most often purchase?
Flank, sirloin, KC strip, porterhouse, t-bone, rib eye, tenderloin, other*

The results of the survey indicated that consumers from both populations had preferences for Kansas City-strip, sirloin, and tenderloin steaks (Figure 4).

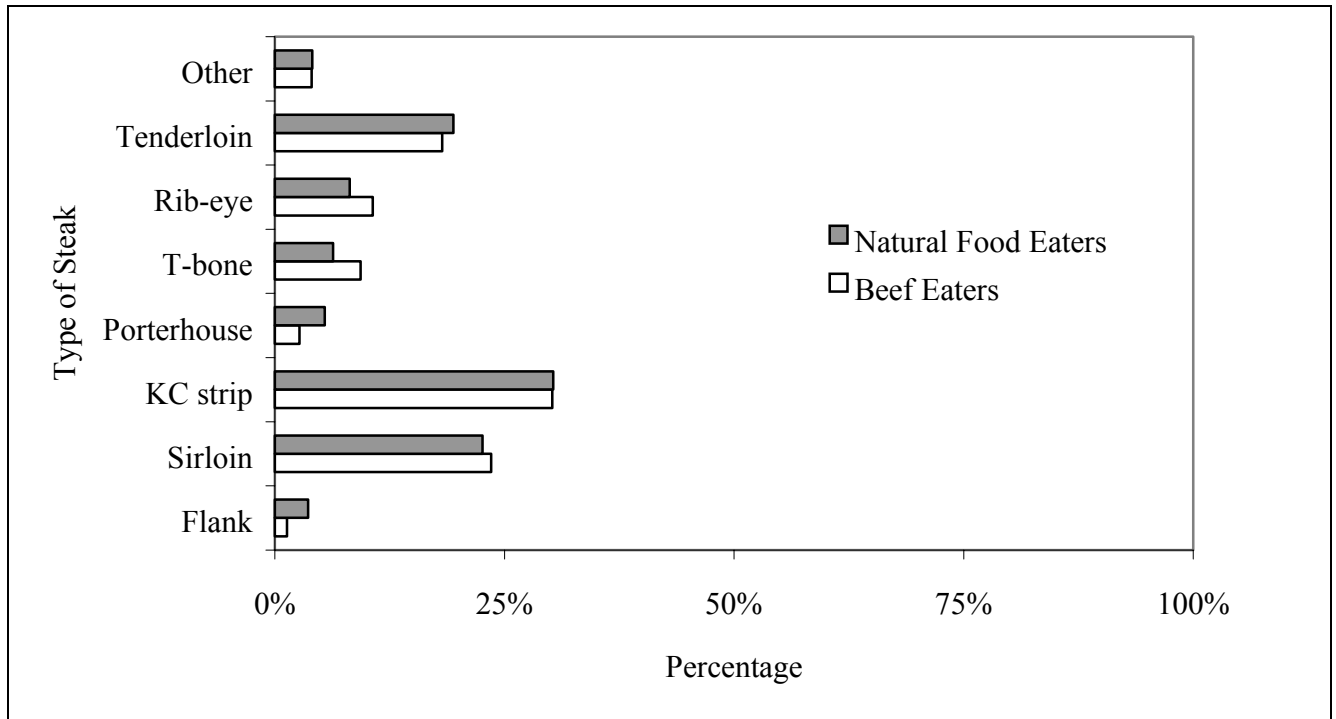


Figure 4. Type of Steak Most Often Bought by Consumers

Again, no statistically significant difference was observed between the two consumer categories.

Question 6: How would you rate these factors in your meat purchasing decisions (1 equals not important, . . . , 5 equals very important)?

Factors: Healthy/safe; convenient (easy to cook and eat); appealing (attractive packaging, color appearance); price.

In evaluating the importance of these factors in meat purchasing decisions, respondents indicated that the health and safety factor was most important (table 3). Visual appeal of the product was the second most important factor. Convenience and price were rated similarly in terms of importance. Again, there were no significant differences between consumer groups.

Table 3. Summary Statistics for Beef-Purchasing Factors

Variable	Beef Eaters		Natural Food Eaters	
	Mean*	Std.	Mean	Std.
Healthy/safe	4.74 ^a	0.62	4.70 ^a	0.72
Convenient	3.90 ^c	0.95	3.91 ^c	1.07
Appealing	4.20 ^b	0.89	4.18 ^b	0.97
Price	3.87 ^c	1.02	3.83 ^c	1.13

* Means with the same superscript letter within each column are not statistically different.

Question 7: How would you rate beef, chicken, and pork on these product characteristics? (1 equals not important, . . . , 5 equals very important)?

Cholesterol, calories, sodium, artificial ingredients, or content?

Consumers in both groups perceived beef as being relatively high in cholesterol content and calories. Beef was perceived to have significantly higher amounts of cholesterol and calories relative to pork and chicken, and significantly higher amounts of sodium and artificial ingredients relative to chicken.

Table 4. Summary Statistics for Ranking Beef, Pork, and Chicken by Product Characteristics

Product Characteristics	Beef Eaters		Natural Food Eaters	
	Mean	Std.	Mean	Std.
Cholesterol: beef	3.73 ^a	0.92	3.81 ^a	0.83
Cholesterol: pork	3.36 ^b	0.97	3.34 ^b	0.93
Cholesterol: chicken	2.23 ^c	0.96	2.40 ^c	1.01
Calories: beef	3.56 ^a	0.91	3.61 ^a	0.86
Calories: pork	3.41 ^{a,b}	0.88	3.32 ^b	0.88
Calories: chicken	2.41 ^b	0.86	2.42 ^c	0.92
Sodium: beef	2.58 ^a	1.02	2.62 ^a	0.98
Sodium: pork	3.07 ^b	1.16	3.07 ^b	1.22
Sodium: chicken	2.20 ^c	0.93	2.25 ^c	0.99
Artificial ingredients: beef	2.46 ^a	1.18	2.50 ^a	1.28
Artificial ingredients: pork	2.60 ^a	1.21	2.59 ^a	1.27
Artificial ingredients: chicken	2.40 ^a	1.21	2.40 ^a	1.29

The only significant difference on perception between the groups was on cholesterol content in chicken – with the “natural food” group perceiving chicken to have higher cholesterol than did the “beef eater” group.

Question 8: How would you rate beef, chicken, and pork on these meat display characteristics (1 equals not important, . . . , 5 equals very important)?
Microwaveability, packaging, display in store, variety of products

Beef was perceived as superior to both pork and chicken in terms of product variety, store display, and packaging. However, for microwaveability, both beef and pork were perceived as inferior to chicken.

Table 5. Summary Statistics for Ranking Meat-Display Characteristics

Meat Display Characteristic	Beef Eaters		Natural Food Eaters	
	Mean	Std.	Mean	Std.
Microwaveability: beef	1.88 ^a	1.11	2.00 ^a	1.17
Microwaveability: pork	1.85 ^a	1.05	1.91 ^a	1.07
Microwaveability: chicken	2.25 ^b	1.35	2.31 ^b	1.32
Packaging: beef	3.78 ^a	0.85	3.76 ^a	0.91
Packaging: pork	3.62 ^b	0.88	3.64 ^b	0.90
Packaging: chicken	3.46 ^c	0.96	3.42 ^c	1.03
Store display: beef	4.00 ^a	0.87	3.98 ^a	0.93
Store display: pork	3.76 ^b	0.93	3.82 ^b	0.95
Store display: chicken	3.65 ^b	1.02	3.68 ^b	1.07

Product variety: beef	4.37 ^a	0.76	4.35 ^a	0.83
Product variety: pork	3.92 ^b	0.99	3.96 ^b	0.97
Product variety: chicken	3.97 ^b	0.99	3.96 ^b	1.05

*Question 9: When you purchase beef, how would you rate these factors (1 equals not important, . . . , 5 equals very important)?
Color, presence of marbling, minimum external fat, tenderness, packaging, brand, leanness, sodium content, artificial ingredients content*

Discuss results in more detail: The natural food eater viewed tenderness or the most important factor on their beef purchase decision and it's rating was significantly higher than that of all other factors. For beef eaters, tenderness and color were judged to be most important. The ratings for color and tenderness by the group were not statistically different but both factors were rated significantly more important than any other factor. This result supports previous findings about the importance of tenderness to beef consumers.

Table 6. Summary Statistics for Ranking Beef-Purchasing Factors

Purchasing Factors	Beef Eaters		Natural Food Eaters	
	Mean	Std	Mean	Std
Color	4.57 ^{bc,bf,bg,bi,bj}	0.70	4.53 ^{bc,bf,bg,bi,bj}	0.74
Presence of marbling	4.05 ^{cf,cg,ci}	0.86	4.04 ^{cf,cg,ci}	1.01
Minimum external fat	4.45 ^{df,dg,di,dj}	0.77	4.45 ^{df,dg,di,dj}	0.90
Tenderness	4.53 ^{ec,ef,eg,ei,ej}	0.64	4.62 ^{ec,ef,eg,ei,ej}	0.63
Good packaging	3.77 ^{fg,fi}	1.08	3.69 ^{fg,fi}	1.03
Brand	3.15	1.14	3.04	1.16
Leanness	4.35 ^{hf,hg,hi}	0.74	4.33 ^{hf,hg,hi}	0.85
Sodium content	3.24	1.16	3.37	1.26
Artificial ingredients	3.98 ^{ig,ji}	1.08	4.01 ^{ig,ji}	1.16

Table 7. Ranking of Beef Purchasing Factors

Rank	Beef Eaters	Rank	Natural Food Eaters
1	Color	1	Tenderness
1	Tenderness	2	Color
3	Minimum external fat	2	Minimum external fat
4	Leanness	4	Leanness
5	Presence of marbling	5	Presence of marbling
5	Artificial ingredients content	5	Artificial ingredients content
7	Good packaging	7	Good packaging
8	Sodium content	8	Sodium content
8	Brand	9	Brand

Table 7 provides a ranking based on significant differences of these factors.

*Question 10: Which of the following best describes your knowledge of All Natural Beef before you read the leaflet.
1 = Never heard of it, 2 = had heard about it, 3 = knew a lot about it*

Consumers were asked about their awareness of natural beef before reading an informational brochure. For both groups, the mean response was about 1.7, indicating that on average, consumer had a relatively low level of familiarity with All Natural Beef.

Table 8. Summary Statistics for Awareness of Natural Beef

Consumer Type	Mean	Std.
Beef Eaters	1.66	0.65
Natural Food Eaters	1.68	0.65

*Question 11: Where had you heard or read about All Natural Beef?
Newspaper, in-store demonstrations, point-of-purchase promotional materials, other*

A comparison of the source of information by response for level of awareness of natural beef revealed that promotional materials were the main sources of information followed by newspapers at the awareness level “had heard of it” (Table 9).

Table 9. Percentage of Responses for Natural-Beef Awareness

Awareness	Newspaper		Promotional Materials		In-Store Sample		Other	
	NF	BE	NF	BE	NF	BE	NF	BE
Had heard of it	31.5	26.6	39.8	46.8	22.2	21.1	19.4	15.6
Knew a lot	17.4	9.1	30.4	50.0	21.7	45.5	52.2	31.8

^aNF and BE denote Natural Food and Beef Eater consumer categories

*Question 12 (13): Prior to (After) reading this leaflet, how would you have characterized your attitude to an “all natural” label?
Positive, negative, indifferent*

Consumers were asked about their attitude toward an all-natural beef label before and after reading an informational brochure about the All Natural Beef Cooperative. The perceived image was overwhelming non-negative prior to reading the brochure (Figure 5).

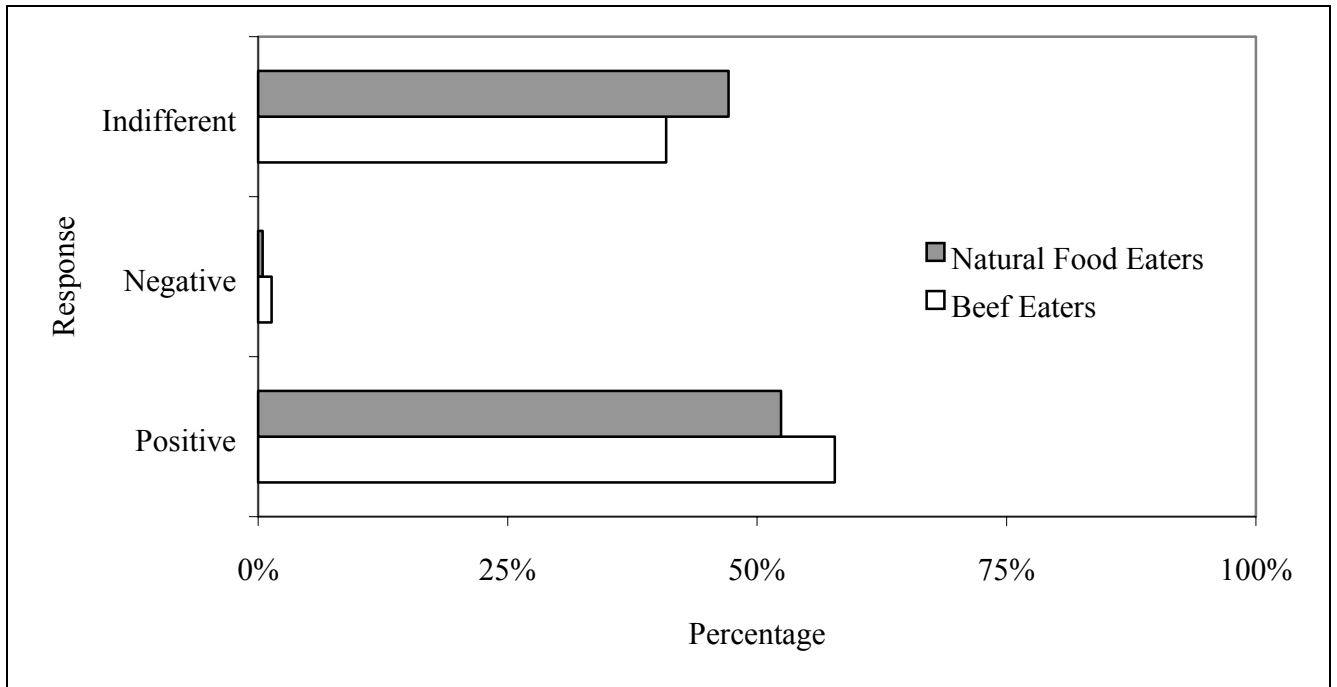


Figure 5. Consumer Attitudes Towards Natural-Beef Label prior to Informational Brochure

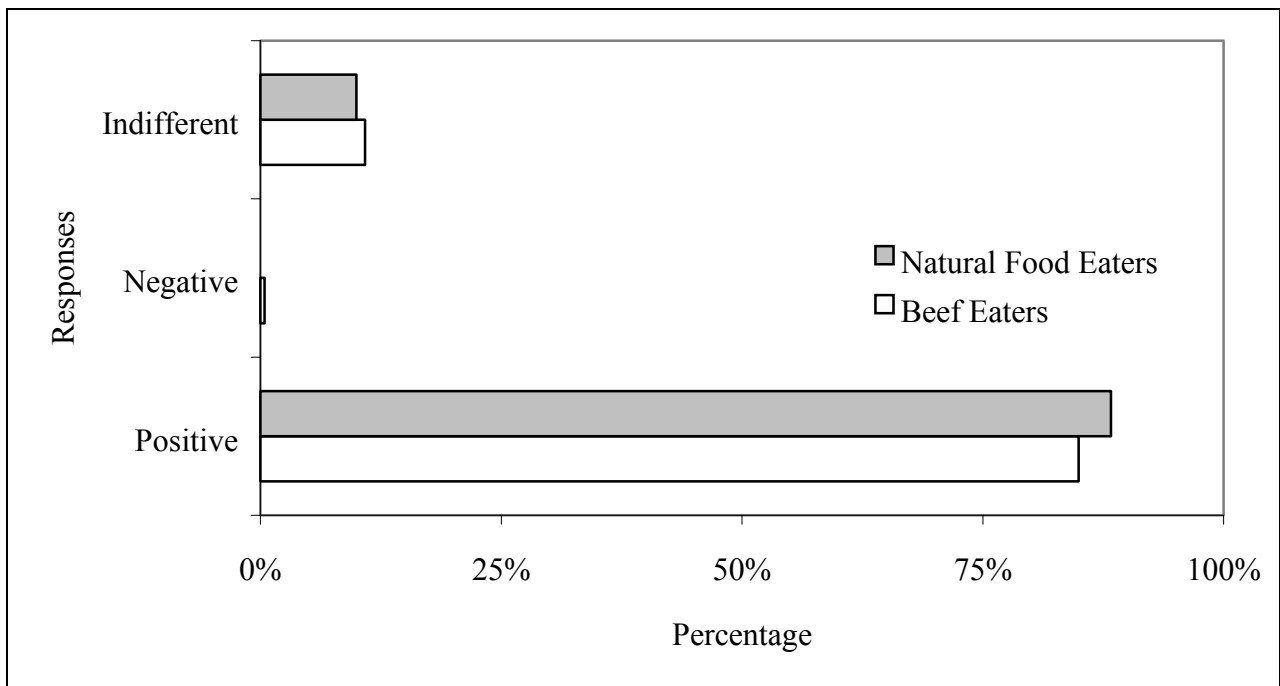


Figure 6. Consumer Attitudes towards Natural-Beef Label after Reading Informational Brochure

Figure 6 clearly shows that consumer attitudes were mainly positive after reading the informational brochure. The results show indicated that 74% of beef eaters and 79% of natural food eaters who had an indifferent attitude prior reading the brochure had changed their attitude to positive. More natural food eaters than beef eaters had significantly changed their attitude.

Summary

This study is motivated by USDA's National Commission on Small Farms and funded through the Fund for Rural America and the U.S. Department of Agriculture's Rural Business Service. The purpose of this research was to provide recommendations for producers interested in marketing natural beef. Results from a survey are used to gather information on consumers from retail supermarkets that sell conventional, organic, and natural food products. The hypothesis that there are two distinct different consumer segments within the collaborating conventional supermarket, beef eaters and natural food-oriented consumers, is rejected for these supermarkets. Meat consumers who were identified through supermarket scanner data as the largest purchasers of beef and natural food products comprised the survey sample. The natural beef is labeled as such at the store. The results indicated that tenderness, leanness and visual appearance were key factors influencing consumers' purchasing decision and should take an important place in the promoting these products.