Consumer Preferences in Purchasing Beef and the Values they Attribute to Branded Beef Products

Authors
Roger D. Hanagriff, Associate Professor at Texas A&M University – Kingsville
Ryan D. Rhoades, King Ranch Management Institute
Doug Wilmeth, King Ranch Management Institute

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Abstract

There have been significant changes in consumer demand at the retail counter, such as health, convenience, palatability preferences, and safety concerns. Branded programs offer a means for satisfying consumer demand for high quality and differentiated beef products. To help answer the question of who is purchasing branded beef market and why, an online survey was sent to interested beef consumers to determine their preferences of purchasing, as well as values they attribute to certain product characteristics. The total sample response from 13,000 contacted consumers was 502 responses, which according to Kreiche and Morgan, 1970 is a valid sample size. Decision variables ranked moderate and always important include guaranteed tender and satisfaction, low price, and low fat or lean. Differences in the strength of the decision values, such as always important, moderately important to seldom important were found with gender, purchasing frequency product differences. Results provide a better understanding of consumer decisions to buy branded beef and may assist producers with advertising decisions.

Hanagriff, Roger
Associate Professor of Agricultural Business
Texas A&M Kingsville
MSC 228
700 University Blvd.
Kingsville, Texas 78363-8202
Email: roger.hanagriff@tamuk.edu

Ryan Rhoades and Doug Wilmeth
Graduate Students
King Ranch Management Institute
Agriculture Department
MSC 228
700 University Blvd.
Kingsville, Texas 78363-8202

Research Objectives

The objective of this research is to identify which decision variables are most influential when consumers purchase branded beef products. Decision variables were created from a top advertising firm's targets of advertising and product packaging and review of literature. The decision variables included tenderness, color, price, source verified and other factors. This study separates ground beef and steak cuts and divides results into demographic variables to test for differences in gender, frequency of purchase, age, and others.

Review of Literature

Studies of consumer demand preferences for beef can be viewed different factors such as food safety or perceived quality characteristics. Several studies have investigated what consumers are willing to pay to avoid or obtain various food attributes (McCluskey et al., 2003; Grannis and Thilmany, 2002; Misra, Grotegut, and Clem, 1997; Misra, Huang, and Ott, 1991; Roosen, Lusk,and Fox, 2003; Burton et al., 2001; Lusk, Roosen, and Fox, 2003; Roosen, 2003; Alfnes,2003; Tonsor et al., 2005).

A few studies have focused on consumer willingness to pay for food safety assurances or risk reductions (Brown, Cranfield, and Henson, 2005; Goldberg and Roosen, 2005; McCluskey et al., 2005). Estimated wiliness to pay can also be used as related to food policy analysis and provide values for food labeling (e.g., Lubben 2005; Lusk and Anderson 2004).

Martinez, Hanagriff, Harris and Lau (2007) indentified that branded beef companies may offer a solution to product attributes that may meet consumers needs. However, many important quality attributes to consumers of beef such as flavor, tenderness, nutrition, and safety are not apparent to consumers until the product is consumed. A number of studies have shown that consumers are willing to pay a premium for more tender beef, so these attributed are hard to determine but if communicated may influence purchasing.

This study is designed to focus on the decision that may influence consumers buying beef products, with a special consideration for branded beef consumers. Other researchers have examined these variables in making purchase decisions. Davis, Yen and Lin (2007) found that Over the past decade, the American diet has changed toward healthier eating and food manufacturers have responded by providing foods, new or reformulated, with added healthy attributes and health claims. Low fat or the reductions of antibiotics may be attributes to increase purchasing. Null (1978) identifies that nutritional attention is the first step in improving health conditions, and with obesity rates high, this may be that time.

This study focuses on consumers value associated with marketing attributes beef marketing companies used to promote their products.

Data and Methods

Research data was collected by developing a consumer preferences on-line survey and disseminating the survey to approximately 13,000 consumers. Consumers were identified from a

branded beef company's list of consumers that receive beef recipes and the company's quarterly newsletter.

This assessment utilized an on-line survey emailed to the consumers sent initially on March 10, 2007. The initial response was 275 surveys completed over a 30 day period. A follow-up survey distribution was developed and resent on April 7, 2007, which resulted in 227 responses. This increased the total sample size to 502 responses. Sampling process was stopped from the company not wanting to request surveys from customers above required response rate.

According to research by Krecjie and Morgan (1970), the required sample size for the given population and 502 responses is statistically significant. Their model is:

$$s = X^2 NP(1 - P) / d^2 (N - 1) + X^2 P(1 - P)$$

Where:

s = required sample size

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841)

N = Population size

P = The population proportion (assumed to be .50 since this would provide the maximum populations size)

d = the degree of accuracy expressed as a proportion (.05)

This model identifies a minimum required 375 responses to statistically represent the 13,000 consumer sample. The total response rate of 502 actually represents a population size of over one million consumers, which provides that this study represents significant results applicable to a very large base of consumers. The data has been analyzed to describe the demographics of consumers as well as analysis of variance and Pearson correlations to identify relationships between demographic variables and consumer preferences.

Analyzed variables included the mean age, gender, household income, frequency of ground beef and steak purchases and importance rank of decision variables. Pearson correlations are relationships between, frequency of purchase and decision variables and compliments purchasing such as wine and fresh vegetables to frequency of purchase. Analysis of variance are differences in decision variable values for gender, household income, previous experience in buying the product, differences in more frequent ground beef versus steak consumers and decision variables and age.

Results

Previous research related to consumer income for major markets such as Houston, Dallas, San Antonio and Phoenix report average household income of approximately $50,000 (2002 Nielson data). These results identify that the largest response group has an income range from $45,000 to $70,000 (27 percent) with a wide range of results in the other categories above and below this range. The mid-point value averages at $73,000 per household, which identifies a slightly higher average than previous research, but again five years may explain the slight increase. The total summary of all demographics of respondents is listed in Table 1.0.

Table 1.0 Total Demographics of Respondents

Gender		**Respondents Age**	
Male	44.20%	Less than 25	1.20%
Female	55.80%	26 to 34	5.60%
Total Respondents	502	35 to 44	18.30%
		45 to 54	39.60%
Family Household is Best Described as…		Over 55	35.30%
Single, No Children	15.90%	Total Respondents	502
Single Parent, with 1 Child	3.40%		
Single Parent, with 2 or more Children	4.40%	**My household income is best described by...**	
Married, No Children	28.50%	Under $20,000	5%
Married, with 1 Child	13.70%	$20 to $45,000	22%
Married, with 2 or more Children	34.10%	$45 to $70,000	27%
Total Respondents	502	$70 to $95,000	18%
		$95 to $120,000	15%
Employment Status		$120 to $145,000	6%
Taking care of children and home	5.60%	$145 to $170,000	3%
Attending school	0.40%	Over $170,000	5%
Retired	16.30%	Total Respondents	501
Part-time	9.00%		
Full-time	68.70%		
Total Respondents	502		

Ground beef consumers also report slightly more frequency in once per week buying. These results will apply to measuring the strength of a customer's value by measuring how often they purchase. For example, the customers that rarely buy steaks may be the same customers that purchase only once per month. This combined value for low purchasing of steaks is 46.4 percent. The next grouping of steak buying value is the average person, which is represented as the once per month buyer (34.2%). The higher end grouping of consumers buying steaks are those purchasing more than once per week, which for this sample is approximately 18 percent (17.9% = 13.3 + 4.6). Table 2.0 summarizes these new group values, which illustrate a three tier grouping for strength of buying steaks and ground beef products.

Table 2.0 Percent Respondents Recognizing Their Frequency of Meat Purchases

	Steaks	Ground Beef
Never Purchase	1.70%	1.40%
Rarely Purchased	46.40%	31.10%
Average Purchase (1 week)	34.20%	38.70%
Above Average Purchase (>1 week)	17.90%	28.80%
Total Respondents	483	483

Another difference in purchasing habits may be related to gender. These values are different when considering steak and ground beef product purchasing habits. Table 3.0 summarizes these differences. Females are average purchasers of steaks while males are highest in the above category in buying steaks. Considering ground beef, females lead all of the purchase categories.

Table 3.0 Percent Respondents Recognizing Their Frequency of Meat Purchases based on Gender

	Steaks		Ground beef	
	Male	Female	Male	Female
Never Purchase	1.83%	2.23%	0.83%	**1.04%**
Rarely Purchased	17.24%	**27.79%**	12.63%	**18.22%**
Average Purchase (1 week)	15.62%	**17.85%**	17.81%	**20.91%**
Above Average Purchase (>1 week)	**9.33%**	8.11%	12.63%	**15.94%**
Total Respondents	493		483	

In reviewing Table 3.0, a question would be: *Since it is obvious that there are differences in purchasing habits based on gender, are the differences significantly different?* An analysis of the differences in variance will identify statistical differences and Table 4.0 illustrates these values.

Table 4.0 Analysis of Variance Comparing Gender Differences with Frequency of Purchasing Steaks and Ground beef

Description	Mean-Male	Mean-Female	F-Value	Significance (P<.05)
Steaks	2.74	2.57	3.62	0.022
Ground Beef	2.96	2.93	16.71	0.596

Mean Value = 1never, 2=rarely, 3=average, 4=above average

As illustrated in table 4.0, ground beef is the highest frequency purchased item, but there is no statistical difference in purchasing by gender. Steak products illustrate higher purchasing by males (2.74 male versus female average of 2.57) and this difference is statistically significant. This identifies that males tend to have higher frequency of purchasing steaks than females.

A report of cross tabulations results for the percent of respondents using each type of advertising and how many consumers rarely purchase, average purchase or above average purchase will measure the reach of advertising to the largest buyers. Table 5.0 identifies steak consumers and their advertising preference. As reported in Table 5.0, recipes are used more by higher purchasing consumers. Fewer consumers recognize this type of advertising, but those using this type tend to purchase more steak products.

Table 5.0 Cross Tabulation for Types of Advertising and Consumers Level of Steak Purchasing (n=129)

	Rarely Buy Steaks	Average Buy Steaks	Above Average Buy
Coupon	18%	19%	6%
Website	14%	9%	2%
Recipe	2%	13%	17%
Newsletter	19%	15%	7%

Relationships for this type of analysis for ground beef may provide similar insight. Table 6.0 identifies the cross tabulation for ground beef purchasing consumers and which type of advertising they utilize.

Table 6.0 Cross Tabulation for Types of Advertising and Consumers Level of Ground Beef Purchasing (n=129)

	Rarely Buy Ground Beef	Average Buy Ground Beef	Above Average Buy
Coupon	14%	16%	12%
Website	12%	9%	3%
Recipe	9%	20%	9%
Newsletter	19%	15%	7%

This identifies fewer differences in the steak results as the percent of advertising uses is similar across each type. Coupons do have the largest above average buy category, but the largest users of a coupon are average volume buyers, so the results are mixed. Recipes again illustrate high value for average and above average buyers.

One of the high value questions for this study is consumers' ratings for the "value" they place on product attributes such as packaging, color, product guaranty, previous experience in buying the product as well as other product variables. These values can be associated as a numeric score, where higher numbers representing more value or the percent of consumers that fall in each category. The categories for each variable are:

- No Impact to my Decision (value 1)
- Seldom Important (value 2)
- Moderately Important (value 3)
- Always Important (value 4)

Table 7.0 illustrates respondents' ratings for "decision factors" consumers consider when they purchase beef.

Table 7.0 The Percent of Consumers and the Value they Associate to "Decision Factors" in Buying Beef

Decision Factors	No impact to my Decision	Seldom Important	Moderately Important	Always Important	Response Average
Guaranteed Tender	3% (15)	7% (30)	32% (145)	**59% (269)**	**3.45**
Guaranteed Satisfaction	5% (23)	10% (45)	27% (122)	**59% (270)**	**3.39**
Low Price	4% (16)	10% (45)	38% (174)	**49% (222)**	**3.32**
Low Fat or Lean	4% (20)	10% (45)	36% (166)	**50% (232)**	**3.32**
Bright Red Color	5% (23)	9% (40)	40% (186)	**46% (216)**	**3.28**
Previous experience in buying this product	7% (32)	9% (40)	42% (189)	**43% (193)**	**3.2**
All Natural	7% (33)	11% (52)	39% (179)	**43% (196)**	**3.17**
No Antibiotics Used on Cattle	11% (50)	16% (75)	30% (137)	**43% (200)**	**3.06**
Meets "American Heart Association" criteria	13% (62)	16% (75)	**43% (198)**	27% (127)	2.85
"Locally Grown" in Texas	19% (90)	21% (97)	**38% (179)**	21% (99)	2.62
Attractive Packaging	28% (130)	**36% (164)**	26% (119)	10% (44)	2.17
Recipe Instructions on Package	29% (134)	**36% (164)**	26% (118)	9% (40)	2.14
Product Spokesperson	33% (149)	**40% (182)**	20% (93)	7% (31)	2.02

Bold factors and values represent the above moderately important values

Considering Table 7.0, the top four valued factors include guaranteed tender, guaranteed satisfaction and low price with an equal value in low fat or lean. As you move down the list, the bolded factors are the ones that have an average response of above a 3.0, which illustrates more responses to moderately and always important. The non-bolded factors include increased responses in the "no impact" or "seldom important" category.

A logical difference in means would be to test if gender plays a role in the value of buying decisions. The importance would be to identify if there are differences in any of the high valued areas (over 3.0 score) when compared with gender. These results are illustrated in Table 8.0.

Table 8.0 Analysis of Variance Comparing Gender Differences with Buying Decision Factors (significant differences p<.05)

Description	Mean-Male	Mean-Female	Average All *(over 3.0 important)*	Difference (+=female>male)	F-Value	Significance (P<.05)
Bright Red Color	**3.18**	**3.35**	**3.28**	**0.17**	**5.15**	**0.024***
Guaranteed Tender	**3.25**	**3.55**	**3.45**	**0.30**	**10.22**	**0.001***
Low Fat or Lean	**3.09**	**3.49**	**3.32**	**0.40**	**29.35**	**0.000***
American Heart Association	**2.63**	**3.00**	**2.85**	**0.37**	**17.76**	**0.000***
No Antibiotics Used on Cattle	**2.83**	**3.22**	**3.06**	**0.39**	**17.52**	**0.000***
All Natural	**3.04**	**3.27**	**3.17**	**0.23**	**7.90**	**0.005***
Low Price	2.74	3.35	3.32	0.61	0.96	0.33
Attractive Packaging	2.23	2.13	2.17	(0.10)	1.31	0.25
Product Spokesperson	2.08	1.95	2.02	(0.13)	2.29	0.13
Locally Raised	2.60	2.63	2.62	0.03	0.07	0.80
Recipe on Package	2.07	2.19	2.14	0.12	1.78	0.18
Previous Experience	3.16	3.23	3.2	0.07	0.71	0.40
Guaranteed Satisfaction	3.11	3.45	3.39	0.34	2.74	0.10

The bolded areas of the table are the significantly different values for male and female respondents. In all areas significant, females value these higher than males. These values represent advertising aspects that will apply more towards females and could influence their decisions to buy. These values are mostly values above the 3.0 category for importance, and therefore represent potentially influential decision factors.

An additional value is to review the categories of complement purchasing with the frequencies of purchasing. Complement goods such as vegetables, soda, beer and wine were products identified by the advertising firm as related products. This aspect of the study was to investigate buying relationships of beef to these products.

Pearson Correlations identify the correlation value for the variable such as “I did purchase an item” and their strength of purchasing such as “never purchase”, “rarely purchase”, “average purchase” or “above average purchase”. A positive correlation identifies an increase in strength of purchase or a negative value that identifies decreasing strength of purchasing. The correlation values for all goods are positive. See Table 9.0 for Pearson Correlation values.

Table 9.0 Correlation Relationship between the Categories of Purchasing and Purchasing of Compliment Goods

	Steak Purchasing (Correlation coefficient)	Ground Beef Purchasing (Correlation coefficient)
Usually NO other items	-0.052	-0.066
Wine	0.196**	0.037
Beer	0.068	0.064
Soda	0.022	0.061
Fresh Vegetables	0.258**	0.137**

*** Significant at the 99% Confidence Interval*

** Significant at the 95% Confidence Interval*

Significant correlations (** or *) identify that the purchases of the item is significantly related to consumers that have greater frequencies of purchasing beef. In the case of steak purchases, consumers that purchase wine are significantly more likely to purchase more steaks (significant at 99% confidence level). In the same steak category, consumers that purchase fresh vegetables are even more likely to purchase more steaks (significant at 99% confidence interval).

Significant correlations for ground beef purchases are not as significant, but fresh vegetables is still a valuable relationship.

Discussion

The results are potential values to marketing and advertising firms promoting the branded beef industry. These values are also illustrations of the markets continued trend in better understanding factors related to purchasing decisions.

This study was particularly related to branded beef consumers that have purchased a nationally known branded beef product. The results illustrate that product guarantee, good color, lean product and health attributes are valued labels when consumers make their purchase decision. There were found to be significant purchasing habits and values by gender, with female buyers representing higher and more frequent purchasing habits. These values may also have application to the production industry and their decisions in changing production practices to meet the demand needs of consumers.

This study also recognizes an increase in sample responses and wider representation of consumers would bring greater value of results. This studies focus targets a particular consumer group, but does offer a rare opportunity to spend research time with a consumer segment of the beef buying market.

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