A Study of the Factors that Influence Consumer Attitudes Toward Beef Products Using the Conjoint Market Analysis Tool

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Abstract

This study utilizes an analysis technique commonly used in marketing, the *conjoint method,* to examine the relative utilities of a set of beef steak characteristics considered by a national sample of 1,432 U.S. consumers, as well as additional localized samples representing undergraduate students at a business college and in an animal science department. The analyses indicate that among all respondents, region of origin is by far the most important characteristic; this is followed by animal breed, traceability, the animal feed used, and beef quality. Alternatively, the cost of cut, farm ownership, the non-use of growth promoters, and whether the product is guaranteed tender were the least important factors. Results for animal science undergraduates are similar to the aggregate results except that these students emphasized beef quality at the expense of traceability and the non-use of growth promoters. Business students also emphasized region of origin but then emphasized traceability and cost. The ideal steak for the aggregate group is from a locally produced choice Angus, fed a mixture of grain and grass that is traceable to the farm or origin. If the product was not produced locally respondents indicated that their preferred production states are, in order from most to least preferred, Iowa, Texas, Nebraska, and Kansas.

Keywords: conjoint market analysis, consumer preferences, country of origin, steak quality, traceability, transactions costs.

Introduction

The imminent arrival of a national animal identification system, advances in traceability, and increased consumer affluence will likely speed the transition of the U.S. beef system from a price-based commodity system to one based on characteristics such as age, quality, method of production, and origin. As this new production chain develops, consumers will be in a position to send price signals to producers to encourage them to produce beef with those characteristics most valued by consumers (Grunert, 1997; Umberger, 2004, 2006; and Farm Foundation 2006).

Of course, branding and product differentiation will only be rewarded if the consumer of the product is willing to pay for the information or assurances associated with the information that is provided by a brand. This suggests that more needs to be done to examine whether and how information about these and other factors influence consumer attitudes, preferences, and price sensitivity to beef products.

To examine these issues and address the questions just raised, we employed a widely used marketing methodology, the conjoint technique, which has been shown to be quite useful as a market research and analysis tool for a variety of consumer goods. The outcomes of this market analysis provide useful information about the importance of traceability in general. Additional specific information regarding the relative importance (i.e., utility) of information about various product characteristics (e.g., country and state of origin, producer information, animal feed, genetics, and hormone use).

Materials and Methods

An Overview of Conjoint Analysis

Conjoint analysis is a statistical analysis technique that has been used in the field of marketing for almost three decades to quantify consumer preferences for new products and services (Huber, 1987). Steak is a product, and like all products it consists of several attributes that can be varied in different potential configurations to appeal to different consumers. For example, a steak might be produced to sell at a certain price, with a given level of marbling or with characteristics that are associated with the way the animal was treated or nurtured. Some features, such as the feed given to the animal or the living conditions of the animal, may be important to some people but less important to others. Conjoint analysis can help to quantify the utility that a potential steak buyer has for one or more of the attributes of a steak. By allowing producers to quantify the

utility of the steak features, an optimum "bundle" of these features can be identified and used to design the "preferred steak."

Conjoint is a multivariate statistical technique that assumes that consumers will evaluate the value of a product by combining the utility of each of the product's attributes in a combinatorial evaluative process. A significant amount of research has been published that has examined conjoint's application for quantifying the market potential for "new and improved" products (Cattin and Wittink, 1982; Wittink et al., 1994). Conjoint analysis has commonly been used in the development process for new products whereby features are dropped or added and combined or altered to identify the optimal mix of features (Green and Krieger, 1991; Hauser and Simmie, 1981; Mahajan and Wind, 1992; Moore et al., 1999; Page and Rosenbaum, 1987; Urban et al., 1990; Urban et al., 1996; Wind et al., 1989; Wittink et al., 1994). Conjoint has been used in this way to measure the relative utility of product features, to identify trade-offs that should be made in product features, and to conduct competitive benchmarking (Weinberg, 1990). Product pricing and market segmentation analyses are other common applications of conjoint analysis (Green and Krieger, 1989, 1992; Hauser and Simmie, 1981). Two types of survey techniques were used in this research: adaptive conjoint analysis and choice-based conjoint analysis.

Adaptive Conjoint Analysis Methodology

Significant research has been conducted on different methodologies and techniques for conducting and analyzing conjoint projects (Akaah and Korgaonkar, 1983; Akaah, 1991; Agarwal, 1988; Agarwal and Green, 1991; Green et al., 1991; Johnson, 1991; Orme, 1999; Tumbush, 1991). Most important for this project is the research that has examined the different approaches used to collect consumer preferences. Research has generally shown that, when compared to non-computer-based approaches, computer-supported conjoint tools allow researchers to examine a larger number of product attributes. This means that much more complex products can be evaluated. Thus, we selected Sawtooth Software's computer-based conjoint package (visit www.sawtoothsoftware.com for more information).

Sawtooth Software, Inc. offers several conjoint packages including Conjoint Value Analysis (CVA), Choice-Based Conjoint (CBC) analysis, and Adaptive Conjoint Analysis (ACA). We elected to use both ACA and CBC for the two segments of this research. ACA is designed to *adapt* the survey questions for each respondent by learning about the preference struc-

ture that each respondent has for product attributes. Subsequent questions are adapted to focus on factors that are of greater importance to the respondent. This approach reduces the number of questions; therefore, ACA allows the researcher to examine product combinations that have many more attributes than would be possible using manual approaches (Johnson, 1987).

ACA has been shown to be reliable and to offer superior results to other approaches for the types of analyses being performed in this project (Agarwal and Green, 1991). The primary disadvantage of ACA is that it often underestimates the relative importance of the price or value of the product. The ACA survey includes four major sections, each of which is used to examine or calibrate particular facets of the respondent's preference structure (Sawtooth Software, 2002). The first section of the survey is the *Preference for Levels* section where the respondent rates their preference levels by assigning a rating score on a seven-point scale. A screen showing an example of the content of this segment of the questionnaire is shown in Figure 1.

The second section of the survey is designed to identify *Attribute Importance* (Sawtooth Software, 2002). The purpose for this section is to determine how important each attribute is to each respondent. To do this, the survey doesn't merely ask the subject to rate the importance of the attribute; rather, the survey poses a question that asks the respondent to evaluate the importance of an attribute in terms of the relative difference in the levels for each attribute. This measure of importance serves two purposes. First, if an attribute is found to be unimportant it may be eliminated from additional evaluation. Second, the importance measure provides information that can be used to determine an initial estimate of the respondent's utility for each attribute (Sawtooth Software, 2002). A screen showing an example of the content of this segment of the questionnaire is shown in Figure 2.

The third section consists of a set of *Paired-Comparison Trade-Off Questions* (Sawtooth Software, 2002). The paired-comparison section is the core of the conjoint process and is designed to force the respondent to make trade-offs between pairs of grouped attributes. For each comparison, the respondent is shown two groups of attributes that are each designed to represent a hypothetical steak product that consists of a set number of attributes. For each grouping, the same set of attributes is considered, but each hypothetical product contains different levels or values for each attribute. The respondent is asked to rate which grouping is preferred by entering a rating score indicating the degree to which he or she prefers each hypothetical product. Every time the respondent completes a paired-comparison question, the overall estimate of the respon-

dent's utility for each attribute is updated. In ACA, this updated utility score is used to adjust the quality and relevance of subsequent paired-comparison questions (Sawtooth Software, 2002). A screen showing an example of the content of this segment of the questionnaire is shown in Figure 3.

The fourth section consists of a set of *Calibrating Concepts* that are designed to refine the utilities obtained in the earlier part of the survey (Sawtooth Software, 2002). These refined utilities are used in the analysis of the conjoint data and for running purchase simulations. The survey will pick the attributes that are determined to be most important based on earlier responses from the subject. A combination of attributes is selected to create a range of profiles, from very unattractive to very attractive, based upon the respondent's preference structure. The survey asks the respondent to estimate the "likelihood of buying" each combination of attributes by entering a numeric value that represents the "probability" that he or she would buy the product. A screen showing an example of the content of calibration segment of the questionnaire is shown in Figure 4.

The final section of the survey used in this study consists of a series of questions that ask about contextual information associated with the respondent. This information includes topics such as the gender, age, income level, and education level of the respondent. In addition, subjects were asked about their level of knowledge about steak products.

Choice-Based Conjoint Methodology

Because of the weakness of ACA relative to price, CBC was selected to collect data from the larger national sample. CBC is designed to create choice scenarios that mimic the actual purchase process (Sawtooth Software, Inc., 2005) and to produce results that are more robust relative to the estimation of price/cost utilities. CBC asks the respondent to indicate preferences by having the respondent choose from "sets of concepts." Because of this, the CBC evaluation process is closest to the processes buyers engage in when making actual purchase decisions. CBC is most frequently used to examine relationships between price and product demand and is most useful when the relationship between price and demand differs from brand to brand. Also, CBC is most appropriate when a small to medium number of product features are to be examined by a large number of respondents (e.g., several hundred consumers).

For this research we used an extension to traditional CBC analysis that makes use of the Hierarchical Bayesian (HB) method for estimating individual-level part worth values (see http://www.sawtoothsoftware.com/cbc.shtml#cbchb). Unlike ACA, which adapts the questions

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on the survey for each individual respondent based on that individual's prior responses, CBC presents the same survey questions to all participants. However, when estimating part worth utility values for each individual respondent, CBC/HB utilizes the choice information from all respondents to estimate the results for each individual respondent. This is a key concept with Bayesian analysis; that is, that information from all respondents is used to estimate results for each individual respondent. With this procedure, the results of the analysis are more robust relative to the non-Baysian CBC model. More information about the CBC/HB software and the Bayesian statistical technique can be found in Sawtooth Software's Technical Paper Series on CBC/HB (Sawtooth Software, 2005).

The structure of the CBC survey is much less complex relative to that of the ACA survey. Specifically, the respondent is presented with a screen that includes all of the factors/attributes that are examined in the study. In this case, we presented three alternative profiles on each screen and asked subjects to select which of these profiles he or she preferred. It is this *forced-choice* approach that is at the heart of the CBC technique in that the respondent is required to indicate which of the combined characteristics (i.e., the product profile) he or she prefers. Because profiles will often include level values for a factor that the subject may prefer in combination with levels for a factor that a subject rejects or does not prefer, this approach presents a more realistic representation of real buying decisions; that is, where consumers are presented with options that may not represent their ideal product profile. A screen showing an example of the content of a CBC profile is shown in Figure 5.

Data Collection Procedures

Prior to the presentation of the survey to the respondents, subjects were presented with instruction screens that explained the purpose of the study and explained the factors that were being examined in the research. The content of these introductory screens is shown in Figures 6 and 7.

Three major waves of data collection were used to develop the results of the study. The first data collection effort focused on refining the factors to be analyzed in this study and to identify the relative importance of respondent knowledge about steak. To accomplish this, we asked students from two different academic programs in the College of Business and in the College of Agriculture (i.e., animal science students) to complete the survey. Students from business were

expected to be relatively naïve about steak while students from animal science were expected to be more knowledgeable about the relative importance of steak features. A statistical analysis of a manipulation check indicated that students had significantly different levels of knowledge about steak. The second data collection effort represents the primary focus of the study, an examination of a national sample of steak consumers. A total of 1,171 participants completed the survey and provided useable data for the study. Participants were solicited with the assistance of a marketing firm, Return Path, Inc. (http://www.returnpath.com), which was paid $5.00 for each valid respondent. Return Path, Inc., screened all participants to make certain that they were potential consumers of steak (e.g., they were not vegetarians) and that they were at least 18 years of age or older.[1] Because the results of the primary data collection effort produced results that were somewhat unexpected both in terms of the similarity of rankings across different segments and the extreme importance reported for locally produced products, we initiated a third wave of data collection to validate the results from the national sample. The third data collection effort involved 211 students from the College of Business who completed the same CBC survey completed by the national sample. Students were offered class credit for participation in the research as an alternative to other class requirements. The results from these three data collection activities are summarized in the next section.

The survey was developed after conducting a focus group consisting of animal science researchers who identified and refined the list of attributes (i.e., steak features) that were determined to be most relevant to consumers. Once the attributes and levels were identified, they were evaluated and refined by a panel of student subjects. The focus of this refinement process involved examining the wording of the questions and attribute levels.

Results

In total, 1,432 individuals responded to the three surveys conducted in this research. In addition to the conjoint survey and information about respondent perceptions, data were also collected about respondent demographics, the respondent's experience with and knowledge of steak, and the attitudes that subjects had about the environment.[2] The average age of the non-

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[1] We checked with a number of marketing researchers, who recommended Returnpath as a reliable subject aggregator. The use of sampling firms is typical in marketing research.
[2] The respondents were not asked for information that would make them individually identifiable.

student respondents was 45.5 years and the average age of the student respondents was 22.1 years. The number of females is 717 (50.1%) and the number of males is 713 (49.9%). Subjects were asked questions about their knowledge pertaining to steak and also about their attitudes pertaining to the environment (the latter for waves 2 and 3 only). Knowledge pertaining to steak was assessed by asking three questions about steak characteristics:

- Which cut of steak is higher quality? (Top Round or Top Sirloin)
- Which grade contains more marbling? (Select or Choice)
- What is marbling? (The amount of fat within the muscle, the amount of connective tissue present in the steak, or the amount of fat on the outside of the steak)

The response for each of these questions was scored as 1 for correct or 0 for incorrect. The mean score for the subjects in each data collection segment is shown in Table 1.

Understanding the Results

The conjoint results comparing business and animal science students were analyzed by first examining the respondents' preference structure in aggregate. The conjoint survey produces results that provide two types of information: (1) the relative utility of the levels within each attribute (also called the *part worth* of the level) and (2) the importance of the attribute of steak. The conjoint relative utilities are scaled to an arbitrary additive constant within each attribute (Orme, 2002). The utility values are designed to sum to zero (0) within each attribute but are completely arbitrary; therefore, the scores can only be compared in a relative sense. For example, the utilities for animal feed are as follows:

Attribute Level	Utility Value
The animal was fed a mix of grass and grain	16.23
The animal was fed grain	12.71
The animal fed on grass	-28.94

These utility values offer an ordinal list showing the relative, not absolute, utility of each factor. For this data set, all that can be inferred is that the first level (the animal was fed a mix of grass and grain) is preferred to the second level (the animal was fed grain) and that the second level is preferred to the third level (the animal fed on grass). These utilities do not indicate the strength

of the priority. For example, one cannot say that the preference of the first factor to the second is any more or less than the relative preference between the second and third even though the numeric values appear to be quite different in absolute value. For the attribute importance, scores are scaled to a 100-point scale with each value representing the importance of each factor in relation to the total for all attributes. The importance for each attribute is calculated by considering the difference that each attribute makes in the total utility of a steak. The value of this difference is determined by looking at the range in each attribute's utility values. A percentage value for the ranges is calculated, obtaining a set of attribute importance values that add to 100. Each importance score represents a percentage of the total importance that each attribute has; therefore, these values can be interpreted as a scalar value.

The utilities and importance scores for the responses to the conjoint surveys are included in Appendix A. The results in the following section include a summary of these data for the aggregate of all respondents as well as within selected segments.

Adaptive Conjoint Analysis: Business versus Animal Science Students

The sorted preferences based on importance are summarized in Table 2. The results of the aggregate analysis for both groups of students are shown in Table 3 and show that region of origin, animal breed, traceability, the animal feed used, and the beef quality are the most important steak features. Alternatively, the cost of cut, farm ownership, the use of growth promoters, and whether the product is guaranteed tender were the least important factors. Based on the utilities and the most important attributes, an ideal steak product would include the attributes displayed in Table 4. The results of the analysis contrasting business and animal science students are summarized in Table 5. The results of the segmented analysis show that for business students, the region of origin, traceability, the cost of cut, and the use of growth promoters were the most important steak features. Alternatively, for animal science students, the region of origin, animal breed, the beef quality, and the animal feed were the most important factors. Based on the utilities and the most important attributes, an ideal steak product for each group would include the attributes displayed in Table 5.

These results demonstrate that the knowledge that a consumer possesses about meat, animal characteristics, and similar features related to steak products will influence attitudes about the features of steak products that are considered important. Students in the animal science

classes approached the decision scenario presented to them in the conjoint survey with significantly more knowledge about the impact that various steak characteristics have on the quality of the steak. Factors such as the animal breed, the quality of the beef cut, and the feed given to the animal all have objectively demonstrable impacts on the quality of the steak that is produced from the animal. The animal science students had this knowledge and this was shown in the attitudes demonstrated in the conjoint results. Alternatively, most business students would not be as likely to have this knowledge about the relationship between these features. Therefore, the preference structure of business students demonstrates a ranking that is based on more superficial characteristics, such as traceability to the birth farm, the cost of the steak, and whether growth promoters were used.

Choice-Based Conjoint Analysis: National Consumer Sample

The sorted preferences based on importance for the national sample are summarized in Table 6. The results of this aggregate analysis show that region of origin, the use of growth promoters, the cost of cut, whether the steak is guaranteed tender, and traceability are the most important steak features. Alternatively, farm ownership, the animal feed used, the steak cut, the animal breed, and whether the product is certified organic were the least important.

Table 7 shows the importance levels when participants are categorized by their knowledge about steak. Rankings are similar across groups with a couple of exceptions. Those who are more knowledgeable appear to have a stronger preference for non-hormone treated beef. Those who are less knowledgeable attach more importance to organic beef. Based on the utilities and the most important attributes, an ideal steak product for the national sample would include the attributes displayed in Table 8.

The national sample also asked respondents an open-ended question: "Which State produces the best steaks?" Results from the 1,135 valid responses are shown in Figure 8 and indicate that beef produced in Iowa is viewed as having the highest quality. Texas, Nebraska, and Kansas are also highly ranked.

The data obtained from the national sample were segmented based on gender; the results of the analysis contrasting male and female respondents are summarized in Table 9. The results indicate that for men, region of origin, the cost of cut, the use of growth promoters, whether the steak is guaranteed tender, and traceability were the most important steak features. Similarly, for

women, the region of origin, the use of growth promoters, whether the steak is guaranteed tender, the cost of cut, and traceability were the most important factors. Based on the utilities and the most important attributes, an ideal steak product for each group would include the attributes displayed in Table 10. These results indicate that although there is some variation in the ranking of these attributes, the general pattern of the responses are similar. For example, while the cost of the cut appears to be more important to men than to women, the same five factors are ranked in the top five by these respondents. Similarly, although there are slight variations in the rank order of the least important factors, the same four factors are considered least important by men and women.

Choice-Based Conjoint Analysis: Student Confirmatory Sample

The results from the national sample raised several concerns about the validity of the findings because, on the surface, the results appear to have several anomalous relationships. For example, the results show that, when considering the aggregate results, respondents consistently rated select cuts of meat as preferable to choice cuts. Similarly, factors such as the animal feed and the steak cut were consistently found to be low in importance while the region of origin was universally found to be the most important factor. Given this, we decided it was necessary to confirm the validity of the results found in the initial survey by conducting a follow-up data collection effort in a more controlled setting. Our concern was that participants in the national sample might have filled the response out carelessly so as to minimize the amount of time required to earn the $5.00 participation fee. Therefore, a third wave of data was collected from students at Iowa State University and compared to the results from the national sample.

The aggregate importance ratings for the student respondents are summarized in Table 11. The results of the analysis indicate that the region of origin, organic certification, the cost of cut, whether the steak is guaranteed tender, and animal feed were the most important steak features. These results, while including a few variations relative to the national sample, are largely similar to the results from the national sample. For example, as is the case for the national sample, students preferred a select cut of meat compared to a choice cut. Also, although animal feed was rated as more important by students, this factor was in a similar relative position to its rank for the national sample. In summary, the results from the confirmatory sample support the general pattern of results seen for the national sample.

Discussion

Consumer Attitudes about Meat Products

Considerable research has been conducted to understand the role that meat characteristics have in forming consumer attitudes toward beef and other meat products. This research has focused on identifying the role that intrinsic and extrinsic characteristics have in perceptions of quality, food safety, and the likelihood of buying the product. In most of the previous research, econometric demand system estimates, surveys, experimental markets, or interviews were used to capture data (Grunert, 1997; Roosen at al., 2003; Wirthgen, 2005; Thilmany et al., 2003; Ziehl et al., 2005; Nayaga et al., 2004; Campiche et al., 2004; Dickinson and Bailey, 2002; and Loureiro and Umberger, 2003, 2005).

Although this previous work has added to our understanding of the consumer forces driving the process (and especially the demographic variables that cause differing responses among consumers), the methodology has typically involved the extraction of consumer preferences from price and sales data, or the elicitation of consumer preferences from surveys and experiments. The conjoint analysis that we provide improves on these other methods both in term of its ability to extract and rank various characteristics and in terms of the numbers of participants that can be included.

We found only one study (Grunert, 1997) that used conjoint to examine meat preference; however, this study was completed for European consumers almost a decade ago. This research examined the Total Food Quality Model (Grunert et al., 1996) by examining the attitudes of consumers in four different European countries: France, Germany, Spain, and the UK. Factors that were examined in this study include the meat cut (i.e., steak, roast, cubed, and minced), color (i.e., light red, medium red, etc.), fat lumps (i.e., major, minor), fat rim (i.e., yes, not), marbling (i.e., high or low), fat content (i.e., high or low), price (i.e., low, medium, high), origin (i.e., no information, Denmark, Ireland, Scotland), information about animal production (i.e., no information or information about the animal welfare and hormone use), and the purchase locale (i.e., a local butcher or supermarkets). Alternative profiles were presented to subjects on cards and included not only descriptors of the meat characteristics but also pictures of the cut of meat. Results indicate that fat content and the place of purchase were the two most important factors influencing perceptions of meat quality. Meat purchased from a butcher was perceived to be higher

in quality. Interestingly, meat that was lower in fat content was found to be viewed more favorably in terms of perceptions of quality (see also Bredahl, 2003). In other words, consumers misunderstood the relationship between meat quality and the features of the meat that influence quality features like tenderness, taste, and juiciness. Interestingly, and in dramatic opposition to the results found here, the information about the country of origin and breeding and farming/production practices were not found to be significantly related to quality perceptions. Of course, these results are likely attributable to the fact that this study predates the outbreak of bovine spongiform encephalopathy (BSE) in Europe; therefore, information about the country of origin and farming practices would likely be rated as much more important currently. Jekanowski et al. (2000) surveyed consumers in Indiana and concluded that consumers (especially female consumers) were willing to pay a premium for locally produced meats. This is consistent with similar results obtained for consumers from California (McGarry-Wolf and Thulin, 2000), Colorado (Thilmany et al., 2003), and the United States (Umberger et al., 2003).

Quality cues in the context of the Total Food Quality Model (Grunert et al., 1996) have been studied in other contexts as well. For example, Bradahl (2003) interviewed 310 shoppers in Danish supermarkets to identify the role of intrinsic and extrinsic cues on the perception of quality of meat products. Shoppers in the supermarket were solicited after selecting a meat product, interviewed briefly in the store, and then asked to complete a survey about the meat product after they had prepared and consumed the meat. Intrinsic cues were presented as descriptive questionnaire items and included percentage fat content, the degree of marbling, the meat color, and the amount of meat juice present in the packaging. Extrinsic descriptive cues included brand name, the price of the product, the product label, the nature of the package sleeve, the presence of an information leaflet, and inclusion of recipes. Other measures included the expected quality, the experienced quality, the method used to prepare the meat, anticipation of future purchases, their familiarity with the product, and their purchase history. The results showed that consumers used extrinsic cues to evaluate the health quality of the product while expected eating quality was based on a mix of intrinsic and extrinsic cues. There was a relationship between the familiarity that consumers had with the meat product and the use of brand as a cue. Consumers who had less familiarity with the product tended to use brand as the primary cue while consumers with greater familiarity relied more on intrinsic cues. Interestingly, price was not found to be a significant factor influencing quality perceptions. Finally, as in previous studies (e.g., Bredahl et al., 1998;

Grunert, 1997; Savell et al., 1989), fat content was found to be negatively related to perceptions of quality. The author refers to this *fat paradox* as a contradiction and an important influence on the expected and experienced quality of the steak. Specifically, consumers who buy steaks that are lean expect them to be higher quality (i.e., to have greater tenderness and better taste) but are disappointed with the quality when the product is actually consumed.

The role of gender in determining attitudes toward food and meat consumption has been a focus of research for a considerable time (e.g., Digby and Stewart, 1996; Dreifus, 1977; Pollard and Hyatt, 1999; Rappoport et al., 1993; Wilkenson and Kitzinger, 1994). For example, Rappoport and his colleagues studied the attitudes of men and women about health, pleasure from food, and convenience. Although the study did not focus on meat consumption per se, the results suggest that women and men have quite different attitudes along these three dimensions. For example, in a study in which subjects evaluated specific meals along these dimensions, women were found to give higher healthy, pleasurable, and convenience ratings to meals that were in fact healthier (Rappoport, et al., 1993). In a survey of consumers, Beardsworth and his colleagues (Beardsworth et al., 2002) found that women were more likely than men to regulate food intake, with health concerns as a primary determinant. Women were also more likely to view food consumption from an ethical perspective, with greater concern expressed by women for the source of the animal used to produce food and the ecological factors that influence that production. Women were also shown to be more *reflective* about food and health issues and, as a result, they were more likely to try novel food offerings. Men, on the other hand, were more conservative in their evaluation of food and considered traditional food offerings as more healthy. This line of research suggests that, when compared to men, women are more likely to express concerns about the origin of food, the impact that food production has on the environment, and the role that food choices have on health.

Finally, in terms of thinking about other ways to classify subjects, the work by Verbeke and Vackier (2004) offers insights about how consumers' attitudes and characteristics influence their perceptions of beef. The authors examined the relationship between consumer involvement in meat products and various characteristics of fresh meat products. They classified meat consumers into one of four categories. First, the *straightforward meat lover* makes consumption decisions primarily based on the goal of finding pleasure in meat without significant concern for other features such as food safety. In general, men are more likely than women to fit into this

category; for example, men were found to be more likely to make decisions based on taste than on health concerns (Institute of European Food Studies, 1996). A second type of meat consumer is classified as the *indifferent meat consumer.* These consumers are not focused solely on obtaining pleasure from eating meat and express low levels of concern about risks related to meat quality or safety. In general, consumers in this category are concerned primarily with price and are unlikely to be influenced by information sources about the health and safety effects associated with meat products. A third type of consumer is classified as the *cautious meat lover.* These consumers seek meat for pleasure and taste but also show a high level of interest in and concern about information related to meat quality and safety. These consumers are typified by women with families who buy meat with a concern for the effects the meat will have on the well-being of family members. A fourth type of consumer is classified as the *concerned meat consumer.* These consumers express significant levels of concern about meat safety and would likely engage in extra effort to seek higher-quality meat from trusted sources (e.g., a local butcher).

This study represents the first comprehensive use of a conjoint methodology in the examination of consumer preferences for beef. The earlier Grunert (1997) conjoint piece primarily examined visible, physical attributes of the beef, with only minimal consideration of the extra-physical characteristics examined here.

The data indicate that region of origin is the dominant decision characteristic among all groups of consumers; no segmentation of the subjects moved this characteristic from its dominant position. For U.S.-based farmers, this is certainly welcome information, as it adds a preference premium to U.S.-produced beef. The results are particularly welcome for beef farmers planning to sell to local markets, and for beef producers in Iowa, Texas, Nebraska, and Kansas who plan to create brands based on the location of their production. The surprising importance attached to location of production may be of relevance given the ongoing debate about country of origin labeling and the implementation of a national animal identity program. However we should also mention that the method we used does not allow us to conduct a cost-benefit analysis of these programs. This is true because participants knew that the responses they provided did not have to be backed up with actual purchases.

For grass-fed producers, the data indicate relatively little value contributed to the consumers' buying decision based upon the feed type of the animal. Feed type becomes more important among more knowledgeable beef buyers (it ranked higher among our business student popu-

lation, who scored higher than our national sample, and higher still among our agriculture student population, who ranked highest with regard to the standard knowledge questions). However, the feed type that was preferred by more knowledgeable consumers was a grass- and grain-fed animal and not a solely grass-fed animal. Although these data indicate that a grass regimen adds little attraction to consumers, they also indicate that knowledgeable consumers care more about feed and do prefer grass within the feed mix. Since many producers of grass-fed beef are also employing a growth-promotant-free production system, it would seem that their product is an attractive one, albeit not made so by the grass-fed characteristic alone.

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Table 1. Results for knowledge manipulation check

	Cut of Steak (Number Correct/Incorrect) Percent Correct	Marbling Grade	Marbling Definition	Average Score Average # Correct
Wave 1: Business students	26/8	25/9	17/17	2.47
	76.47%	73.53%	50.00%	
Wave 1: Animal science students	39/3	40/2	41/1	2.86
	92.86%	95.24%	97.62%	
Wave 2: National sample	957/178	755/380	710/435	2.13
	84.32%	66.52%	62.56%	
Wave 3: Business students	181/40	133/88	139/82	2.15
	85.78%	63.03%	65.88%	

Table 2. Importance: business and animal science students

Business students	Total	Animal science students	Total
Region of origin	19.34	Region of origin	19.73
Traceability	12.65	Animal breed	16.55
Cost of cut	11.37	Beef quality	12.64
Growth promoters	11.07	Animal feed	11.69
Animal breed	11.03	Traceability	10.89
Animal feed	10.22	Cost of cut	8.76
Farm ownership	8.84	Farm ownership	8.51
Guaranteed tender	8.81	Guaranteed tender	6.48
Beef quality	6.68	Growth promoters	4.74

Table 3. Importance: aggregate response for business and animal science students

	Total
Region of origin	19.61
Animal breed	14.06
Traceability	11.59
Animal feed	11.17
Beef quality	10.06
Cost of cut	9.88
Farm ownership	8.55
Growth promoters	7.56
Guaranteed tender	7.52

Table 4. Ideal steak product for business and animal science students

- The steak came from a local U.S. producer
- The animal breed is Angus
- The steak can be traced to the farm on which the animal was born
- The animal was fed a mix of grain and grass
- The steak is a choice cut

Table 5. Ideal steak product for business and animal science students

Business students	Animal science students
• The steak came from a local U.S. producer	• The steak came from a local U.S. producer
• The steak can be traced to the farm on which the animal was born	• The animal breed is Angus
• The steak costs 10% less than the average price of other steaks	• The steak is a choice cut
• No growth promoters were fed to the animal	• The animal was fed a mix of grain and grass

Table 6. Importance: aggregate response for national sample

	Total
Region of origin	23.12
Growth promoters	14.47
Cost of cut	12.51
Guaranteed tender	11.04
Traceability	8.96
Organic certification	7.96
Animal breed	5.80
Steak cut	5.64
Animal feed	5.36

Table 7. Importance: segmented by knowledge about steak features

	Low Knowledge	Average Knowledge	High Knowledge
Steak Cut	5.43	5.37	6.07
Animal Breed	6.07	5.87	5.57
Animal Feed	5.51	5.33	5.32
Farm Ownership	5.40	5.34	4.75
Region of Origin	23.95	23.53	22.17
Traceability	8.76	9.36	8.63
Growth Promoters	12.91	14.22	15.63
Cost of Cut	12.20	12.06	13.21
Guaranteed Tender	11.64	10.90	10.87
Organic Certification	8.14	8.02	7.78

Table 8. Ideal steak product for national sample

- The steak came from a local U.S. producer
- No growth promoters were fed to the animal
- The steak costs 10% less than the average price of other steaks
- The steak is guaranteed tender
- The steak can be traced to the farm on which the animal was born
- If the Steak comes from out of state it should come from Iowa

Table 9. Importance: male and female respondents

Male respondents		Female respondents	
	Total		Total
Region of origin	22.48	Region of origin	23.70
Cost of cut	14.05	Growth promoters	15.40
Growth promoters	13.44	Guaranteed tender	11.41
Guaranteed tender	10.65	Cost of cut	11.14
Traceability	8.59	Traceability	9.28
Organic certification	7.68	Organic certification	8.18
Steak cut	6.50	Animal breed	5.64
Animal breed	6.01	Animal feed	5.40
Animal feed	5.33	Farm ownership	5.03
Farm ownership	5.27	Steak cut	4.83

Table 10. Ideal steak product for men and women respondents (in order of importance)

Male respondents	Female respondents
• The steak comes from a local U.S. producer	• The steak came from a local U.S. producer
• The steak costs 10% less than the average price of other steaks	• No growth promoters were fed to the animal
• No growth promoters were fed to the animal	• The steak is guaranteed to be tender
• The steak is guaranteed to be tender	• The steak costs 10% less than the average price of other steaks
• The steak can be traced to the farm on which the animal was born	• The steak can be traced to the farm on which the animal was born

Table 11. Importance: aggregate response for confirmatory sample

	Total
Region of origin	27.06
Organic certification	11.95
Cost of cut	10.42
Guaranteed tender	10.38
Animal feed	7.76
Traceability	7.19
Growth promoters	7.18
Steak cut	6.35
Farm ownership	6.26
Animal breed	5.43

Figure 1: Rating preferences for each factor level
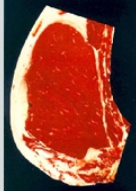
Figure 2: Rating importance for each factor level

Figure 3: Paired-comparison trade-off question

Figure 4: Calibrating concepts question

Figure 5: CBC product profile

Figure 6: Welcome screen

Study on Steak Characteristics

Thank you for taking this survey. Our goal in this survey is to identify the characteristics of steak products that you prefer when you select a steak.

The survey contains two components. The first component will ask you to rate the relative importance of various features that you might consider when selecting a steak. The survey will mix and match features to try to ascertain which characteristics you prefer and how these characteristics compare in importance and utility. Please answer the questions based on your own experiences with purchasing and eating steak. Some questions deal with features that you possibly have not considered before when selecting a steak, so please consider whether such features are important to you even if you haven't considered these issues previously.

The survey is designed to ask you to compare the features of steak products by showing you a mix of various alternative product configurations. Therefore, the survey presents a variety of products in each question and repeats this process several times. As a result, each screen will contain similar information that you may think is the same as previous questions. While they may be similar, there will be differences that will allow the software to understand the criteria you are using to evaluate each steak product. Please be patient and attempt to consider each screen's contents carefully.

The second component of the survey will ask you questions about you. Please be assured that all responses will be kept confidential and that there will be no attempt to associate any response with any one individual.

We expect that this survey will take between 15 and 20 minutes to complete. It is important to complete the survey in one session since the software we are using to manage this survey does not allow you to save and later resume an in progress survey (if you leave the browser open and return to the same window at a later time your survey can be resumed). Also, please do not hit the BACK button (once you leave a page, it is submitted and cannot be retrieved).

If you have any questions about the research, the survey, or other issues related to this project, please email the principal investigators at misresearch@iastate.edu.

Next

0%　100%

Figure 7: Steak factor descriptions presented to subjects

The following are the categories that you will be asked questions about during the survey. Please look over these categories and familiarize yourself with them prior to beginning the survey.

The information about each steak product will be presented in columns on the following pages. We recommend that you evaluate each product by reading the contents of that product's column. Once you have evaluated each product, then make your selection by comparing the products in each column.

Steak Cut: The cut of steak is...
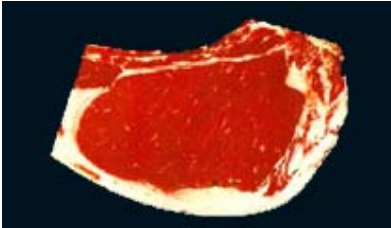
Choice Cut   **Select Cut**

Animal Breed: The animal breed is...
- **Angus**: The Angus breed is black in color, has a smooth hair coat, and has no horns. Angus cattle qualify under USDA requirements for select and choice cuts of meat.
- **Breed not specified**: A variety of cattle breeds that qualify under USDA requirements for both select and choice cuts of meat.

Animal Feed: The animal was fed one of the following during finishing...
- **Grain**: Corn and other grains constitute the primary feed during finishing.
- **A mix of grass and grain**: a mix of grass and grain is used during finishing.
- **Grass**: Grass and other forage constitute the primary feed during finishing.

Farm Ownership: The animal came from either a...
- **Family Farm**: As defined by USDA regulations, a farm that produces agricultural commodities for sale in such quantities so as to be recognized in the community as a farm and not a rural residence; produces enough income (including off-farm employment) to pay family and farm operating expenses, pay debts, and maintain the property; is managed by the operator; and has a substantial amount of labor provided by the operator and the operator's family.
- **Corporate Farm**: A corporate farm is a business producing food or fiber products that is organized as a corporate entity for tax purposes. It is owned by stockholders and run by a board of directors. The principle stockholders do not necessarily have family relationships with the operators of the farm.

Region of Origin: The meat came from either a...
- **Local producer**: cattle growers with a demonstrated regional affiliation with the market in which the steak is sold; i.e., the producer is identified with the region in which the steak is purchased.
- **Producer from a Quality Region**: cattle grower from a region in the U.S. with a history of and reputation for high quality beef production
- **U.S. producer**: cattle growers located in the United States
- **Mexican producer**: cattle growers located in Mexico
- **Australian producer**: cattle growers located in Australia
- **Canadian producer**: cattle growers located in Canada

Figure 7 (cont.): Steak factor descriptions presented to subjects

Traceability: The ability to retrieve the history, treatment, and location of the animal that a cut of meat comes from, through a recordkeeping and audit system or registered identification program. Traceability usually refers to the ability to track meat to the animal from which it was produced.

- **Traceable to the birth farm**: Meat that you purchase can be traced back to a specific animal on the farm on which it was born.
- **Traceable to the feed lot:** Meat that you purchase can be traced to the feed lot on which a group of animals were finished prior to processing and slaughter. Feed lot operators can combine animals from a variety of sources and may have lots that are all locally produced, lots that are a mix of local and non-local cattle, or lots that are entirely a single breed.
- **Traceable to processing plant only:** Processors frequently take animals from one or more feed lots and combine them into a process lot that are slaughtered together. Animals may be from the same farm, region, or country of origin, depending on how the processor constructs the lot. The information about the region of origin, farm ownership, etc. can be maintained with the meat in some, but not all, cases (e.g., if a processor runs a lot only with animals from a single region, or only from organic farms, then the lot can be regionally certified or organically certified). Regardless of the "type" of meat you purchase, it can only be identifiably traced to a processing plant and a specific slaughter lot.

Growth Promoters: Hormonal growth promoters are naturally occurring or synthetic products that are approved in the U.S. for use in beef cattle. The effect of hormonal growth promoters is to increase lean tissue growth.

- **Growth promoters were used**:
- **No Growth promoters were used**

Cost of Cut: The steak is priced at...

- **10% more than average**
- **An average price**
- **10% less than average**

Guaranteed Tender: The steak is guaranteed by the processor to be tender. Tenderness is measured though a variety of techniques depending upon the processor, but all are designed to assess the ease with which the steak can be chewed.

- **Tenderness is guaranteed:** The steak is labeled with a guarantee that the meat is tender
- **No guarantee of tenderness:** The label says nothing about the tenderness of the meat

Certified Organic: To be certified organic, a beef product must meet a number of criteria specified in USDA's national standards for production, handling and processing of organically produced agricultural products. In order for beef products to be labeled organic, the livestock must have been fed only organic feed (grass or grain) and received no antibiotics or growth promotants. Vaccines are permitted to keep the livestock healthy.

- **Certified organic:** The steak is labeled with a certification that the meat is organic
- **Not Certified organic**: The steak is not certified to be organic (i.e., the label says nothing about the organic certification of the steak)

Figure 8. National sample, open-ended responses to the question "Which state produces the best steak?"
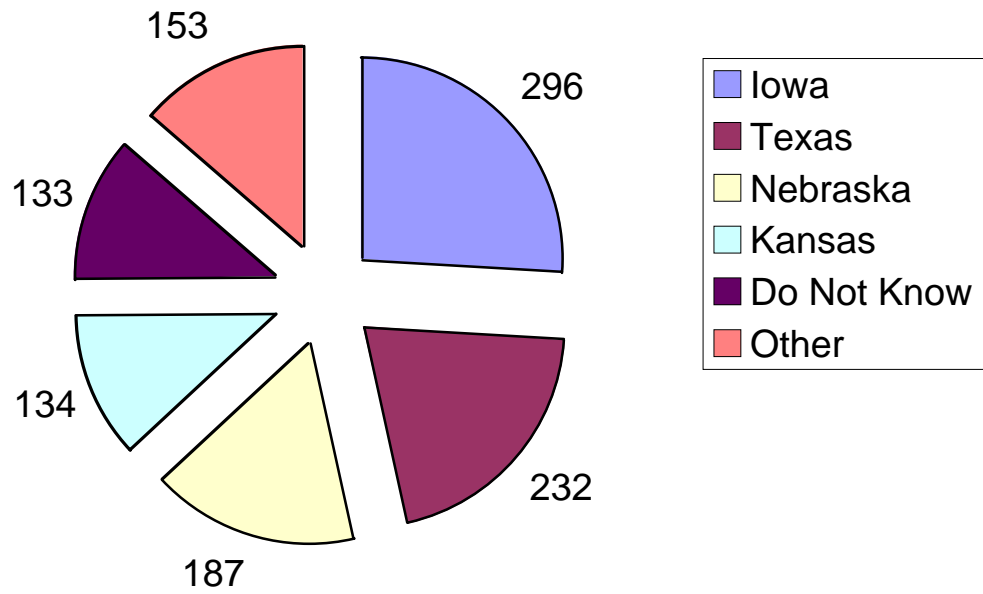
APPENDIX A

Detailed Conjoint Results

Wave 1: Business vs. Animal Science Students

Table A - 1 *Importance*: Aggregate Response

	Total
Region of Origin	19.61
Animal Breed	14.06
Traceability	11.59
Animal Feed	11.17
Beef Quality	10.06
Cost of Cut	9.88
Farm Ownership	8.55
Growth Promoters	7.56
Guaranteed Tender	7.52

Table A - 2 *Utilities*: Aggregate Response

Average Utility Values

Rescaling Method: Zero-Centered Diffs

	Total
The steak is a Choice Cut	32.42
The steak is a Select Cut	-32.42
The animal is from the Angus breed	50.92
The animal is from the Holstein breed	-26.17
The animal is from the Brahman breed	-27.32
The animal is from the Charolais breed	2.57
The animal was fed grain	12.71
The animal was fed a mix of grass and grain	16.23
The animal fed on grass	-28.94
The animal came from a Family Farm	33.36
The animal came from a Corporate Farm	-33.36
The animal came from a local producer	63.04
The animal came from a U.S. producer	65.87
The animal came from a Mexican producer	-76.20
The animal came from an Australian producer	-26.77
The animal came from a Canadian producer	-25.95
The animal can be tracked to its birth farm	35.29
The animal can be tracked to the feed lot	19.97
There is no information about the origin of the animal	-55.26
Growth promoters were used on the animal	-22.49
No growth promoters were used on the animal	22.49
The steak is priced at 10% more than average	-44.67
The steak is priced at an average price	6.70
The steak is priced at 10% less than average	37.97
The label states that the steak is guaranteed to be tender	31.26
The label makes no claims about the tenderness of the steak	-31.26

Wave 1: Business vs. Animal Science Students

Table A - 3 *Importance*: Segmented by *Who Buys Steak*

	Me (Respondent)	Someone Else
Beef Quality	11.82	8.85
Animal Breed	15.48	13.08
Animal Feed	11.88	10.69
Farm Ownership	8.15	8.82
Region of Origin	21.20	18.52
Traceability	11.13	11.90
Growth Promoters	6.34	8.39
Cost of Cut	8.15	11.07
Guaranteed Tender	5.84	8.68

Table A - 4 *Utilities*: Segmented by *Who Buys Steak*

Average Utility Values by BuysSteak

Rescaling Method: Zero-Centered Diffs

	Total	Me	Someone Else
The steak is a Choice Cut	32.42	43.49	24.80
The steak is a Select Cut	-32.42	-43.49	-24.80
The animal is from the Angus breed	50.92	49.68	51.78
The animal is from the Holstein breed	-26.17	-34.91	-20.15
The animal is from the Brahman breed	-27.32	-29.09	-26.11
The animal is from the Charolais breed	2.57	14.32	-5.52
The animal was fed grain	12.71	16.46	10.14
The animal was fed a mix of grass and grain	16.23	16.23	16.22
The animal fed on grass	-28.94	-32.69	-26.36
The animal came from a Family Farm	33.36	30.97	35.00
The animal came from a Corporate Farm	-33.36	-30.97	-35.00
The animal came from a local producer	63.04	78.51	52.38
The animal came from a U.S. producer	65.87	67.49	64.76
The animal came from a Mexican producer	-76.20	-81.29	-72.68
The animal came from an Australian producer	-26.77	-34.04	-21.76
The animal came from a Canadian producer	-25.95	-30.66	-22.70
The animal can be tracked to its birth farm	35.29	33.75	36.35
The animal can be tracked to the feed lot	19.97	19.52	20.29
There is no information about the origin of the animal	-55.26	-53.27	-56.64
Growth promoters were used on the animal	-22.49	-16.09	-26.91
No growth promoters were used on the animal	22.49	16.09	26.91
The steak is priced at 10% more than average	-44.67	-35.48	-51.00
The steak is priced at an average price	6.70	5.71	7.39
The steak is priced at 10% less than average	37.97	29.76	43.62
The label states that the steak is guaranteed to be tender	31.26	22.91	37.00
The label makes no claims about the tenderness of the steak	-31.26	-22.91	-37.00

35

Table A - 5 *Importance*: Segmented by *Knowledge About Steak Features*

	Low	Moderate	High
Beef Quality	9.87	10.55	5.24
Animal Breed	16.80	13.51	14.38
Animal Feed	9.67	11.54	15.04
Farm Ownership	7.76	8.33	8.21
Region of Origin	17.84	20.38	15.87
Traceability	13.52	11.55	6.94
Growth Promoters	9.89	5.94	17.08
Cost of Cut	6.54	10.73	11.61
Guaranteed Tender	8.10	7.47	5.62

Table A - 6 *Utilities*: Segmented by *Knowledge About Steak Features*

Average Utility Values by Correct

Rescaling Method: Zero-Centered Diffs

	Total	Low	Moderate	High
The steak is a Choice Cut	32.42	19.41	39.36	11.96
The steak is a Select Cut	-32.42	-19.41	-39.36	-11.96
The animal is from the Angus breed	50.92	70.93	45.36	55.00
The animal is from the Holstein breed	-26.17	-13.85	-32.83	-11.50
The animal is from the Brahman breed	-27.32	-29.74	-26.03	-24.16
The animal is from the Charolais breed	2.57	-27.35	13.49	-19.34
The animal was fed grain	12.71	1.09	16.27	6.01
The animal was fed a mix of grass and grain	16.23	15.53	18.35	8.38
The animal fed on grass	-28.94	-16.62	-34.62	-14.39
The animal came from a Family Farm	33.36	26.13	33.44	28.78
The animal came from a Corporate Farm	-33.36	-26.13	-33.44	-28.78
The animal came from a local producer	63.04	51.82	65.90	63.37
The animal came from a U.S. producer	65.87	53.89	69.64	61.77
The animal came from a Mexican producer	-76.20	-58.74	-82.51	-64.57
The animal came from an Australian producer	-26.77	-14.48	-29.65	-33.41
The animal came from a Canadian producer	-25.95	-32.48	-23.37	-27.17
The animal can be tracked to its birth farm	35.29	42.86	34.59	24.19
The animal can be tracked to the feed lot	19.97	21.16	21.04	10.85
There is no information about the origin of the animal	-55.26	-64.02	-55.63	-35.05
Growth promoters were used on the animal	-22.49	-24.75	-17.30	-61.91
No growth promoters were used on the animal	22.49	24.75	17.30	61.91
The steak is priced at 10% more than average	-44.67	-27.80	-49.54	-50.31
The steak is priced at an average price	6.70	5.25	8.50	2.28
The steak is priced at 10% less than average	37.97	22.55	41.04	48.03
The label states that the steak is guaranteed to be tender	31.26	36.00	30.09	24.84
The label makes no claims about the tenderness of the steak	-31.26	-36.00	-30.09	-24.84

Wave 1: Business vs. Animal Science Students

Table A - 7 *Importance*: Segmented by *Gender*

	Female	Male
Beef Quality	7.92	11.71
Animal Breed	12.94	14.91
Animal Feed	11.03	11.29
Farm Ownership	9.47	7.84
Region of Origin	17.94	20.89
Traceability	13.99	9.74
Growth Promoters	7.66	7.48
Cost of Cut	11.29	8.80
Guaranteed Tender	7.74	7.35

Table A - 8   *Utilities*: Segmented by *Gender*

Average Utility Values by Gender

Rescaling Method: Zero-Centered Diffs

	Total	Female	Male
The steak is a Choice Cut	32.42	27.02	36.56
The steak is a Select Cut	-32.42	-27.02	-36.56
The animal is from the Angus breed	50.92	42.89	57.08
The animal is from the Holstein breed	-26.17	-37.96	-17.12
The animal is from the Brahman breed	-27.32	-17.61	-34.78
The animal is from the Charolais breed	2.57	12.68	-5.18
The animal was fed grain	12.71	0.09	22.41
The animal was fed a mix of grass and grain	16.23	19.89	13.42
The animal fed on grass	-28.94	-19.97	-35.83
The animal came from a Family Farm	33.36	37.75	29.98
The animal came from a Corporate Farm	-33.36	-37.75	-29.98
The animal came from a local producer	63.04	57.82	67.04
The animal came from a U.S. producer	65.87	58.13	71.81
The animal came from a Mexican producer	-76.20	-68.56	-82.05
The animal came from an Australian producer	-26.77	-22.32	-30.18
The animal came from a Canadian producer	-25.95	-25.07	-26.62
The animal can be tracked to its birth farm	35.29	47.92	25.59
The animal can be tracked to the feed lot	19.97	20.45	19.61
There is no information about the origin of the animal	-55.26	-68.38	-45.20
Growth promoters were used on the animal	-22.49	-20.67	-23.90
No growth promoters were used on the animal	22.49	20.67	23.90
The steak is priced at 10% more than average	-44.67	-54.38	-37.21
The steak is priced at an average price	6.70	10.66	3.67
The steak is priced at 10% less than average	37.97	43.72	33.55
The label states that the steak is guaranteed to be tender	31.26	31.71	30.90
The label makes no claims about the tenderness of the steak	-31.26	-31.71	-30.90

Table A - 9 *Importance*: Aggregate Response

	Total
Steak Cut	5.64
Animal Breed	5.80
Animal Feed	5.36
Farm Ownership	5.14
Region of Origin	23.12
Traceability	8.96
Growth Promoters	14.47
Cost of Cut	12.51
Guaranteed Tender	11.04
Organic Certification	7.96

Table A - 10 *Utilities*: Aggregate Response

Total Respondents

	Total
Total Respondents	1135

Average Utility Values

	Rescaling Method:	Zero-Centered Diffs

	Total
Choice Cut	-4.57
Select Cut	4.57
Angus	22.41
Breed not specified	-22.41
Grain	3.17
A mix of grass and grain	3.31
Grass	-6.48
Family Farm	20.54
Corporate Farm	-20.54
Local producer	68.23
Producer from a Quality Region	36.18
U.S. producer	76.38
Mexican producer	-110.44
Australian producer	-42.67
Canadian producer	-27.68
Traceable to the birth farm	34.78
Traceable to the feed lot	-0.37
Traceable to processing plant only	-34.41
Growth promoters were used	-61.57
No growth promoters were used	61.57
10% above average	-46.11
Average price	15.61
10% below average	30.50
Tenderness is guaranteed	49.50
No guarantee of tenderness	-49.50
Certified organic	27.06
Not certified organic	-27.06

Wave 2: National Sample

Table A - 11 *Importance*: Segmented by *Who Buys Steak*

	Me	Someone Else	Both me and Someone Else
Steak Cut	5.81	5.30	5.41
Animal Breed	5.64	6.05	6.09
Animal Feed	5.42	4.83	5.49
Farm Ownership	5.33	4.88	4.81
Region of Origin	23.07	21.36	24.05
Traceability	8.88	9.13	9.12
Growth Promoters	14.61	13.83	14.33
Cost of Cut	12.60	13.28	11.93
Guaranteed Tender	10.85	12.78	10.75
Organic Certification	7.80	8.55	8.03

Table A - 12 *Utilities*: Segmented by *Who Buys Steak*

Total Respondents by Who Buys Steak	Total	Me	Someone Else	Both me and Someone Else
Total Respondents	1135	702	139	291

Average Utilities by Who Buys Steak

Rescaling Method: Zero-Centered Diffs

	Total	Me	Someone Else	Both me and Someone Else
Choice Cut	-4.57	-2.10	-7.44	-9.25
Select Cut	4.57	2.10	7.44	9.25
Angus	22.41	21.79	25.23	22.80
Breed not specified	-22.41	-21.79	-25.23	-22.80
Grain	3.17	3.41	1.93	3.18
A mix of grass and grain	3.31	3.43	2.19	3.49
Grass	-6.48	-6.83	-4.12	-6.67
Family Farm	20.54	21.80	17.41	19.05
Corporate Farm	-20.54	-21.80	-17.41	-19.05
Local producer	68.23	66.63	61.34	74.98
Producer from a Quality Region	36.18	36.82	32.47	36.36
U.S. producer	76.38	75.79	70.04	80.58
Mexican producer	-110.44	-111.10	-94.74	-116.01
Australian producer	-42.67	-42.13	-36.54	-46.57
Canadian producer	-27.68	-26.01	-32.56	-29.33
Traceable to the birth farm	34.78	35.20	32.61	34.95
Traceable to the feed lot	-0.37	-0.76	1.83	-0.52
Traceable to processing plant only	-34.41	-34.44	-34.44	-34.43
Growth promoters were used	-61.57	-61.56	-58.06	-62.64
No growth promoters were used	61.57	61.56	58.06	62.64
10% above average	-46.11	-46.35	-50.08	-43.50
Average price	15.61	15.52	17.60	14.98
10% below average	30.50	30.83	32.48	28.53
Tenderness is guaranteed	49.50	48.04	59.80	48.60
No guarantee of tenderness	-49.50	-48.04	-59.80	-48.60
Certified organic	27.06	26.78	28.84	26.69
Not certified organic	-27.06	-26.78	-28.84	-26.69

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Wave 2: National Sample

Table A - 13 *Utilities*: Segmented by *Knowledge About Steak Features*

Total Respondents by Knowledge About Steak Features

	Total	Low Knowl-edge	Average Knowledge	Highly Knowl-edgeable
Total Respondents	1135	239	476	420

Average Utilities by Knowledge About Steak Features

Rescaling Method: Zero-Centered Diffs

	Total	Poor Knowledge	Average Knowledge	Highly Knowl-edgeable
Choice Cut	-4.57	-5.21	-4.48	-4.31
Select Cut	4.57	5.21	4.48	4.31
Angus	22.41	22.02	22.94	22.04
Breed not specified	-22.41	-22.02	-22.94	-22.04
Grain	3.17	1.48	1.49	6.04
A mix of grass and grain	3.31	2.63	5.77	0.90
Grass	-6.48	-4.10	-7.27	-6.94
Family Farm	20.54	22.45	20.80	19.17
Corporate Farm	-20.54	-22.45	-20.80	-19.17
Local producer	68.23	72.11	70.80	63.10
Producer from a Quality Region	36.18	35.81	37.79	34.56
U.S. producer	76.38	79.33	78.47	72.34
Mexican producer	-110.44	-111.59	-111.16	-108.95
Australian producer	-42.67	-45.80	-45.02	-38.23
Canadian producer	-27.68	-29.87	-30.86	-22.82
Traceable to the birth farm	34.78	30.63	36.99	34.63
Traceable to the feed lot	-0.37	0.07	-1.22	0.34
Traceable to processing plant only	-34.41	-30.71	-35.77	-34.97
Growth promoters were used	-61.57	-51.35	-60.68	-68.41
No growth promoters were used	61.57	51.35	60.68	68.41
10% above average	-46.11	-39.00	-44.96	-51.46
Average price	15.61	14.90	14.29	17.51
10% below average	30.50	24.10	30.67	33.95
Tenderness is guaranteed	49.50	50.14	48.35	50.44
No guarantee of tenderness	-49.50	-50.14	-48.35	-50.44
Certified organic	27.06	25.96	28.03	26.58
Not certified organic	-27.06	-25.96	-28.03	-26.58

Table A - 14 *Importance*: Segmented by *Gender*

	Male	Female
Steak Cut	6.50	4.83
Animal Breed	6.01	5.64
Animal Feed	5.33	5.40
Farm Ownership	5.27	5.03
Region of Origin	22.48	23.70
Traceability	8.59	9.28
Growth Promoters	13.44	15.40
Cost of Cut	14.05	11.14
Guaranteed Tender	10.65	11.41
Organic Certification	7.68	8.18

Wave 2: National Sample

Table A - 15 *Utilities*: Segmented by *Gender*

Total Respondents by Gender

	Total	Male	Female
Total Respondents	1135	539	588

Average Utility Values by Gender

Rescaling Method: Zero-Centered Diffs

	Total	Male	Female
Choice Cut	-4.57	-6.08	-3.60
Select Cut	4.57	6.08	3.60
Angus	22.41	23.77	21.31
Breed not specified	-22.41	-23.77	-21.31
Grain	3.17	3.91	2.59
A mix of grass and grain	3.31	3.05	3.63
Grass	-6.48	-6.96	-6.22
Family Farm	20.54	20.68	20.45
Corporate Farm	-20.54	-20.68	-20.45
Local producer	68.23	64.26	71.92
Producer from a Quality Region	36.18	34.25	38.17
U.S. producer	76.38	73.12	79.09
Mexican producer	-110.44	-107.46	-113.07
Australian producer	-42.67	-40.80	-44.32
Canadian producer	-27.68	-23.37	-31.78
Traceable to the birth farm	34.78	31.36	37.67
Traceable to the feed lot	-0.37	0.21	-0.89
Traceable to processing plant only	-34.41	-31.56	-36.77
Growth promoters were used	-61.57	-55.19	-67.45
No growth promoters were used	61.57	55.19	67.45
10% above average	-46.11	-53.60	-39.23
Average price	15.61	16.79	14.58
10% below average	30.50	36.81	24.66
Tenderness is guaranteed	49.50	46.97	51.98
No guarantee of tenderness	-49.50	-46.97	-51.98
Certified organic	27.06	24.24	29.33
Not certified organic	-27.06	-24.24	-29.33

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Wave 3: Confirmatory Student Sample

Table A - 16 *Importance*: Aggregate Response for Confirmatory Sample

	Total
Steak Cut	6.35
Animal Breed	5.43
Animal Feed	7.76
Farm Ownership	6.26
Region of Origin	27.06
Traceability	7.19
Growth Promoters	7.18
Cost of Cut	10.42
Guaranteed Tender	10.38
Organic Certification	11.95

Table A - 17   *Utilities*: Aggregate Response for Confirmatory Sample

Total Respondents

	Total
Total Respondents	221

Average Utility Values

Rescaling Method:	Zero-Centered Diffs

	Total
Choice Cut	-2.67
Select Cut	2.67
Angus	18.91
Breed not specified	-18.91
Grain	9.05
A mix of grass and grain	6.53
Grass	-15.57
Family Farm	22.53
Corporate Farm	-22.53
Local producer	72.83
Producer from a Quality Region	49.79
U.S. producer	77.95
Mexican producer	-120.71
Australian producer	-47.82
Canadian producer	-32.04
Traceable to the birth farm	18.24
Traceable to the feed lot	1.31
Traceable to processing plant only	-19.55
Growth promoters were used	-7.68
No growth promoters were used	7.68
10% above average	-25.43
Average price	9.23
10% below average	16.20
Tenderness is guaranteed	45.07
No guarantee of tenderness	-45.07
Certified organic	47.86
Not certified organic	-47.86