MEAT CONSUMER'S BELIEFS, ATTITUDES, AND BEHAVIOR

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CHAPTER I

INTRODUCTION

The meat processing industry has been forced to adapt to changing and evolving needs of consumers. The United States' population characteristics are undergoing major changes, and these changes have important implications for the food industry (Senauer, Asp, Kinsey, p.2). Not only are demographic changes occurring, but consumer needs are changing, as well. There are people on special diets and consumers are more conscious of labels and ingredients. Consumers are becoming more health conscious and convenience oriented (Putnam, p.8).

The population is growing older, living longer, and residing in smaller households, and moving south and west. The ethnic mix is changing, as well. African Americans, Hispanics, and Asians are all rapidly growing segments of the population. These specific groups will inevitably have unique and specific needs that the meat processing industry will have to accommodate if they expect to remain competitive (Senauer, Asp, Kinsey, p.2).

Mature consumers make up one of the fastest growing segments of the population in the United States. The number of people 65 and older will more that double in the next 50 years, 30 million to 68 million in the year 2040. These people are expected to be healthy, active, and financially secure (Senauer, Asp, Kinsey, p.3). The aging Americans will have special needs, such as low-sodium and low-fat items

(Senauer, Asp, Kinsey, p.3). The aging of the population has encouraged increased consumption of flour and cereal products. The demand for these products is expected to rise in the 1990's as the first of the baby boom generation, the largest U.S. population segment, reaches 45 in 1991 (Putnam, p.7).

Over half of all households are composed of 1 or 2 members which increases demand for smaller units in food packaging. Singles living alone were either "young" or "old". Singles and small families usually eat out more often (Senauer, Asp, Kinsey, p.3). A 40 percent increase in real per capita disposable income between 1971 and 1989 also influenced food trends; higher incomes allowed consumers to buy more costly processed products and to eat out more often. Americans spent 46 percent of every food dollar in food service establishments in 1989 compared to 34 percent in 1971 (Putnam, p.8).

There are also more dual-income households, which changes the family structure and how family members make decisions. Sociologists and psychologists say that it changes the balance of power in family decisions and that it changes the relative value of time and how time is allocated to household tasks such as food shopping and cooking (Senauer, Asp, Kinsey, p.103). Dual-income families at all income levels increase their spending power over that of single-income families (Senauer, Asp, Kinsey, p.104).

The racial and ethnic mix of the population has been shifting in recent years. In 1989, whites accounted for 84.1 percent of the population, blacks for 12.4 percent, and others (mostly Asians) for 3.5 percent. In 1971, whites accounted for 87.5 percent, blacks for 11.2 percent, and others for 1.3 percent (Hispanics can be any

race). The increase in minority groups, particularly from Third World countries, has diversified the types of food available. Hispanics comprised 8.3 percent of the population in 1989, and Asians, 2.8 percent. Their cuisines are becoming increasingly popular among the general population (Putnam, 7).

The changes in the ethnic and racial mix of the population also have influenced American food use patterns over the past 20 years. ERS research based on the 1981-86 Continuing Consumer Expenditure Diary Surveys conducted by the Bureau of Labor Statistics indicates that whites, blacks, and others allocate their food dollar in substantially different ways (Putnam, p.7). Black urban households spent about 5 percent more per capita on meat, poultry, fish, and eggs than white urban households in 1986. Whites, however, spent 90 percent more than blacks on dairy products, 195 percent more on cheese, 50 percent more on carbonated soft drinks, and 49 percent more on sugar and sweets (Putnam, p.7). Whites spent about 112 percent more on food eaten away from home. Others (excluding blacks) spent 440 percent more than whites on rice, 106 percent more on fish, and 17 percent more on fruits and vegetables.

General meat consumption trends have been changing dramatically since 1970. Red meat consumption fell from three-fourths of all meat consumed in 1970 to two-thirds in 1986. Instead, Americans ate more poultry, fish, grains, and cereal products. From 1970 to 1986 poultry consumption more than offset the decline in red meat consumption, which pushed total meat consumption gradually upward. Red meat dropped from 151 pounds per capita in during 1970-1974 to 140 in 1986.

Poultry increased from 49 pounds per capita during 1970-1974 to 72 in 1986 (Bailey, Duewer, Gray, Hoskin, Putnam, Short, p.1).

Poultry consumption rose primarily because of lower prices than those for red meats. Poultry was used more extensively in frozen entrees and convenience foods than were red meats. However, price advantage was not the only factor effecting consumer poultry choices. The poultry industry has been a leader in marketing innovations for several years with cut-up birds, branded items, precooked and pan-ready products, boneless breast filets, turkey franks, turkey breakfast sausages, and turkey ham and salami. These products have appealed to convenience oriented and fat conscious consumers (Bailey, Duewer, Gray, Hoskin, Putnam, and Short, p.1).

Of all domestic consumption of meat, only beef and pork failed to show a clear trend upward or downward. Veal, lamb, and mutton all decreased by more than 50 percent during the last 25 years, and both chicken and turkey almost doubled. Fish consumption increased steadily but not as dramatically (Bailey, Duewer, Gray, Hoskin, Putnam, and Short, p.7).

The changing lifestyles of consumers and the changing meat consumption trends in the past several decades makes it necessary to explore the needs of consumers and consumer attitudes. Consumers' needs match their lifestyles. Consumer attitudes ultimately effect every decision a firm makes about product, price, promotion, and distribution. A firm must understand the attitudes of consumers before they can meet their needs and attempt to modify or create attitudes through promotional strategies.

Marketing means providing customers with a product or service that fills a need. Market research is a way to identify the actual or perceived needs of consumers.

Meat processors have access to extremely well developed technologies. These technologies make it possible to extend shelf-life, change packaging methods, increase the value added, and basically make products more "ready-to-serve". However, quite often, small companies do not have access to the market research that is vital to making the best decisions possible at any given time. Market research requires financial resources as well as expertise that are not often available to smaller firms.

Problem Statement

Small meat processors in the South Central region (Oklahoma, Louisiana, Texas, etc.) are looking for ways to profitably operate. Many are interested in exploring market niches which might involve developing a new product or expanding a product line. In order to accomplish their objectives, processors need to determine the needs of consumers and develop appropriate products to satisfy those needs.

Marketing strategies and tactics allow processors to segment markets and target specific customers within those segments. Even though small processors might be at a significant disadvantage in attempting to engage in mass marketing, they may successfully market to specific segments or target markets which large processors cannot or will not serve.

Complicating the marketing task are changes in the needs of targeted segments. Lifestyle and demographic changes include more two income families,

increasing numbers of single parent homes, single person households, increased number of ethnic population groups, aging of families, health consciousness, increased tendency for away-from-home food consumption, and dietary concerns. All of those factors have impacted meat consumption patterns and created marketing challenges for the meat industry. The baby boomer bulge in the population will be living longer and will be "mature consumers" in 20 years. All of these factors add up to a group of special markets with changing and specific needs.

Processors need to understand consumer attitudes about meat products. They need to know how food is stored and handled in the home from the time of purchase to the time of preparation. They also need to know consumer's perceptions about various meat characteristics and how the different meat groups compare to each other in relation to those characteristics, and the processing alternatives available at the supermarket.

The question facing meat processors is not whether or not they are capable of adding value to and developing meat products, but whether or not these efforts are important to consumers. Processors need to know consumers' needs before they can adequately produce products that satisfy those needs. Small meat processors are disadvantaged because they frequently lack the financial resources and human expertise necessary to perform market research. Providing small meat processors with this market information is providing a public good that small processors can use to decrease their competitive disadvantage.

Until processors know consumer attitudes toward meat product alternatives, they cannot make appropriate choices about what processing, packaging and preservation methods are best suited for today's consumer.

Objectives

The overall objective of the project is to increase the small meat processing firm's ability to make better decisions concerning the product, price, promotion and distribution of meat products. Specific objectives are:

1. To describe how consumers rate the importance of: a) meat product characteristics; b) incentive factors for increasing meat consumption; c) interest in specific products; d) their degree of knowledge about product characteristics (i.e. taste, fat level, nutritional value, economical value, convenience/ease of preparation); e) and meat handling in the household.

2. To determine whether vacuum packaging solves a problem that consumers identify as important (i.e. consumer adversity to freezing meat products) and to determine whether consumers are receptive to vacuum packaged products.

3. To describe market segments based on tastes and preferences and demographic characteristics.

The thesis is organized in three additional chapters. Chapter II describes the consumer behavior concepts and how they are applied to meat consumer's decisions. In Chapter III, the analytical procedures and results are described. Conclusions and recommendations for further research are presented in Chapter IV.

CHAPTER II

ANALYSIS OF CONSUMER BEHAVIOR

The purpose of Chapter II is to outline the fundamental consumer behavior concepts that are used in this analysis and to discuss how the concepts were applied.

The study of the decision-making units and the processes involved in acquiring, consuming, and disposing of goods, services, experiences, and ideas is defined as consumer behavior analysis (Mowen, p.5). There are various reasons for studying consumer behavior, such as: assisting managers in decision making, providing marketing researchers with a theoretical base from which to analyze consumers, helping legislators and regulators create laws and regulations, and assisting the average consumer in making better decisions. The study of consumers can help people understand more about the psychological, sociological, and economic factors that influence human behavior (Mowen, p.9).

Two related approaches to consumer behavior are briefly reviewed. The first is the utility maximization approach used in economics. The second is the approach to consumer behavior used by marketing researchers, particularly those with a background in psychology.

Utility Maximization Approach

According to Henderson and Quant, p.34, "The basic postulate of the theory of consumer behavior is that the consumer maximizes utility. Since his or her income is limited, he or she maximizes utility subject to a budget constraint, which expresses his or her income limitation in mathematical form." Economists assume consumers maximize utility or "welfare" of the household. Equation (1) is an example of Barten's household utility function and has a single size and composition parameter. The utility level is U, X1 and X2 are quantities of food and non-food, m is the household size and composition parameter, and v is a utility function (Brown and Johnson, p.287).

(1) $U = v(X1/m, X2/m)$

Maximization of equation (1) subject to the budget constraint $PiXi = y$, where Pi is the price of commodity i and y is household income, yields the Marshallian demand equations (Brown and Johnson, p.287)

(2) $Xi/m = gi(P1, P2, y/m)$

For constant prices, the Engel relationship for food in expenditure form, is

(3) $P1X1/m = B0 = B1(y/m)$, or

(4) $P1X1 = B0m = B1y.$

Similar functions were used by Capps and Schmitz in a study that examined health and nutrition factors in demand analysis. If the Engel curve 'ceteris paribus' condition is to be met, families should be in homogeneous social classes; in homogeneous geographical areas; classified according to family composition, and in

homogeneous categories (urban worker families with two children) (Phlips, p.103-104).

Tastes and preferences are difficult to quantify and the data are not typically available, therefore, accounting for tastes and preferences is a problem for economists. Capps and Schmitz suggest that research is needed to identify and assess non-economical variables (attitudinal variables) which might be important in explaining consumption, and that agricultural economists should work jointly with psychologists, sociologists, nutritionists, and home economists in the consideration of these variables (p.30-31). Economists frequently do, however, have data on household size, composition, and demographics when doing analyses of household data. From research such as the research being done for this project, a connection might be drawn between demographic characteristics and tastes and preferences. Thus an index could be developed to adjust for differences in tastes and preferences by way of demographic market segmentation. Economists generally "assume" that all households are homogeneous or that a representative household is being analyzed. Since it is nearly impossible to categorize families this homogeneously, it is argued that an adjustment for differences in tastes and preferences must be made.

Using cross-sectional data, economists have frequently used demographic characteristics of households in functions to explain expenditures or consumption. Impacts of socio-economic and demographic and psychological variables on food consumption can be analyzed. Research done in 1977 by Hassan and Johnson shows that the traditional demand function, specified as a function of income alone, has low explanatory power in the analysis of cross-sectional data. This supports the idea that

sociodemographic variables play a key role in explaining consumption behavior (Raunikar, Huang, p.186). However, few studies have analyzed the linkages between the socio-economic and demographic variables and tastes and preferences.

Many studies have been done which focus on the structure of meat demand. Alston and Chalfant; Braschler; Brown and Schrader; Chavas; Choi, and Sosin; Dahlgran; Eales, and Unnevehr; Moschini, and Meilke; Nyankori, and Miller;and Thurman have all approached meat consumption and demand through the structure of demand and econometric analysis. Gao, and Shonkwiler did a particularly interesting study on the taste change in meat demand. They account for the change in beef demand by using latent variables and forming a proxy to determine the effects of tastes and preferences. They actually show consumption of beef as a function of consumption of whole or low fat milk. The milk consumption variable is intended to account for tastes and preferences.

While most of the research has dealt with the structure of demand, there have been some studies that have gone to the consumer to examine tastes and preferences. Capps and Schmitz; Borra; Branson, Cross, Savell, Smith, and Edwards; Purcell; Skaggs, Menkhaus, Torok, and Field; and Yankelovich, Skelly and White have all done research which attempts to incorporate the consumer into the process of evaluating tastes and preferences for meat products. Several of these studies use approaches from marketing research as opposed to economic theory.

Marketing Research Approach

Marketing researchers, particularly those with a background in psychology, place considerably more emphasis on the decision making processes used by consumers in different situations and with different products. Marketing researchers are generally much less concerned about households in general but are more concerned about market segments that can be targeted by marketing strategies. Market segments are defined by their demographic characteristics, psychographic characteristics, socio-economic characteristics, and/or geography. Linkages between attitudes and beliefs and demographic characteristics are interesting to marketers because marketers frequently have publicly reported data about demographic variables, however, data on attitudes and beliefs are expensive to develop. If linkages between attitudes and beliefs and demographic variables can be established, it may be possible to use sets of demographic variables as proxies for attitudes and beliefs/tastes and preferences.

Type of product is one of the first factors to consider. Marketing researchers suggest that products fall somewhere along a decision involvement continuum which ranges from low-involvement to high-involvement. Involvement is a measure of interest in a product, and how various things such as "risk" affect the level of interest and involvement. Each consumer's level of involvement varies. Some consumers consider meat a low-involvement product, relative to "all" consumer goods, which means that these consumers make their decisions without an extensive search process. This means that a consumer most likely does not read in-depth reports on the product as they might if buying a new Mercedes Benz. Consumers might consider a meat

purchase less important than purchases of higher involvement goods (i.e. cars, suits, and electronics). However, some might argue that meat products are higher-involvement than most other food products. People on special diets tend to be more conscious of labels and therefore are high-involvement consumers. Each individual consumer has a different level of involvement, depending on his or her personality and individual buying habits, etc. For example, some people are risk adverse while others are risk takers. Involvement is determined by a consumers level of interest in a product and its attributes.

The consumer might make decisions about meat purchases based on the experiential and affective qualities of meat. Meat has attributes which definitely appeal to the senses. In fact, much of the literature evaluating meat product acceptability tends to refer to its "sensory value" or "sensory qualities".

Consumers often link attributes with a product. Meat has many attributes that consumers can identify. Taste, packaging, nutritional value, color, economical value, versatility, tenderness, convenient/ease to prepare, shelf-life, quality and level of fat are all examples of meat product attributes. The question is whether or not consumers consider meat characteristics as positive attributes or benefits of attributes. Consumers' perceptions of meat products can only be understood through marketing research.

This leads to the question of how consumers perceive meat products. Beliefs shape attitudes, which, in turn, shape behaviors. A behavior such as a purchase or repeated purchase is desired by the processor and retailer.

The order in which beliefs, attitudes, and behaviors occur can be explained by hierarchies of effects (Mowen, p.234). Since meat is a relatively low-involvement purchase (compared to "all" goods), the low-involvement hierarchy applies. In the low-involvement hierarchy, beliefs, lead to behavior which leads to affect or feelings. Beliefs are part of the cognitive process in which information is processed by the consumer and then encoded into memory for later use (Mowen, p.229). Attitudes can be formed directly through classical and operant conditioning, and mere exposure (Mowen, p.231). For example, attitudes toward vacuum packaged meat products might change (positively or negatively) with repeated exposure to the products. Behavior can be formed directly through sales promotions or gimmicks that induce the purchase or behavior before attitudes or beliefs are formed.

Trends are often identified in the meat industry, but the cause of these trends has not been clearly demonstrated, but has been a matter of speculation. Market research is necessary to demonstrate whether or not there is a link between consumer knowledge (beliefs), consumer attitudes, and consumer interest in products (which, in turn, will elicit purchase behavior). If this is accomplished, then it is probable that given certain identifiable consumer beliefs and attitudes, one can determine consumer interest in a proposed product.

One of the things that drives or motivates consumers is need. Hunger or the need for nourishment is very obvious and basic. Consumers are typically very concerned about product safety, and safety in a highly perishable meat product can be a problem. Maslow's hierarchy of needs identifies physiological needs and safety needs as the most basic. Meat products might help satisfy needs and help consumers

reach a desired state. This could be especially true in the need-driven group described by a values and lifestyles (VALS) schema. This group consists of the survivors and sustainers in our society who are in the first stage in the VALS double hierarchy. This group might consist of the lower income people in society who spend a larger percentage of their income on food.

Risk can also be a strong motivating factor. In fact, motivation to avoid risk is a mid-range motivation theory. In general, consumers are risk averse (Mowen, p.161). Perceived risk deals with the negative outcomes of a decision and the probability that these outcomes will occur (Mowen, p.161). There are various types of risks that consumers identify. When evaluating the shelf-life of meat products, there is a perceived physical risk. Consumers might be safety conscious about food products, especially meats which are very perishable and require refrigeration. Financial risk might also be a factor. Is the consumer willing to pay more for products with added value? Time might also enter into the consumer's perception of risk. Consumers are convenience oriented, and are trying to "save time". Some of the highly processed products in supermarkets today act as a risk reducer because they impose fewer time constraints on the consumer. Health risks might also act as motivators, especially for consumers on special diets. Consumers tend to have an individual level of acceptable risk; the perceived risk must not be greater than the acceptable risk before a consumer will purchase a product.

Consumers go through a decision-making process when purchasing a good or service. This is a process that involves analyzing the available choices, and behavior before and after the choice process (Mowen, p.283). The decision making

perspective that applies to meat purchases, is the low-involvement decision perspective. This process begins with problem recognition (a need is perceived), and is followed by limited search, a minimal evaluation of the alternative choices, a simple choice process, and evaluation of the purchase (Mowen, p.286). There is a possibility that the experiential or behavioral influence perspectives will be followed, as well. For example, a consumer might engage in a behavior (purchasing meat) to elicit good feelings, i.e. a salesperson buys steak for a celebration dinner after a big sale because that was a tradition during celebrations when he was growing up. A behavioral influence perspective might be applicable in the case of a store demonstration or promotional sampling of meat products. In this case, the promotional tactics might elicit a purchase behavior even though attitudes and beliefs were not previously formed.

A concept closely related to the decision-making process is the consumer choice process. Low-involvement scenarios show consumers using noncompensatory models of choice called hierarchical models of choice. The consumer compares alternatives based on attributes, one attribute at a time in a hierarchial manner (Mowen, p.327). A compensatory model or a heuristic model of choice might be used in the case of meat product purchases. The conjunctive rule is used when the consumer sets cutoffs for each attribute that is a priority, and when the product doesn't meet the cutoff it is eliminated. This serves as a means of eliminating the numerous choices available. An elimination-by-aspects heuristic model could be used which views each alternative as a collection of aspects or attributes. The choices are

made in a hierarchial fashion. Products are eliminated if they don't possess the attribute in question (Mowen, p.328).

The diffusion of innovations concept is important to marketers, because it is vital to the growth of companies, and to the spread of information about new product ideas and services. A company's success can depend on product improvement and innovations that fit a changing marketplace (Mowen, p.479); a product must fulfill the needs of a target market (Mowen, p.482). Consumer marketing research is necessary to identify consumer needs and to determine the receptiveness of consumers to product innovations. Innovations are very costly to market because of the need for heavy mass media advertising and product education campaigns. The processor must know if their will even be a need for the product before investing in its production and promotion.

The success of a product innovation might depend on identifying the early adopters of the product. The innovators and early adopters serve as opinion leaders and influence others in the target market.

Another consumer behavior concept which relates to meat products is semeiotics. Meat products that are in a fresh form or those having little value added, are usually never branded. The packaging, therefore, tends to be very plain and generic. Processors of these products do not take advantage of signs (logos) as a form of communicating information about the product to the consumer. Some product lines are, however, experimenting with branding. In these cases, the use of a logo or an emblem might help communicate information about a product to consumers. This is especially important in areas of product innovations like vacuum

packaging where consumer awareness tends to be low. Perhaps the use of semeiotics could help differentiate meat products with special attributes, and could help place the product in the evoked set of consumers. This means the product is available in memory and is recognized as one of the possible product choices.

An Integrated Conceptual Framework

Based on economists' maximization of utility concept and the marketing research concept of consumer attitudes and beliefs, the following hypothesis can be formed.

C = f(Prices, Income, Involvement, Decision Processes, Attitudes/Beliefs)

Where C is consumption and involvement, attitudes/beliefs (tastes and preferences) are accounted for by using demographic characteristics that are linked to tastes and preferences. This linkage is derived from what we learn about tastes and preferences from consumer research.

The role of this research project is to approach the consumer to determine tastes and preferences and then to form linkages to demographic segments of consumers.

CHAPTER III

ANALYTICAL PROCEDURES AND RESULTS

To establish linkages between demographic characteristics and attitudes and beliefs it is necessary to have data that describes consumer needs, wants, behavior, and demographic characteristics. Based on the conceptual model described in the previous chapter, a questionnaire was designed as an instrument for gathering the appropriate data. The consumer survey was sent to 3,000 consumer households in the Tulsa area. Tulsa is demographically similar to the United States population in terms of a variety of population characteristics. The city is particularly similar to the U.S. population in percentage male versus percentage female, and in ethnic mix (Up Close Census Source Book, and U.S. Bureau of the Census Statistical Abstract). The sample was an nth random sample, and was an updated list of names and addresses, updated within one month of the survey issuing date. This list was guaranteed to have less than 1 percent return to sender addresses. This was important in eliminating the bias caused by people having moved and changed their address.

A pilot survey was completed by 50 respondents from Oklahoma State University. The respondents consisted of students, faculty, and staff. The pilot survey concentrated on shelf-life and vacuum packaging more than the revised survey, and also had a series of questions specific to lamb consumption. The questionnaire

was modified and concentrated on interest in specific meat products, importance of meat characteristics, consumer knowledge, consumption habits, and demographics.

The survey consisted of three legal-size pages printed on one side only, and a cover letter. The survey was made up of a series of basic consumption questions, bipolar scales ranking interest in specific meat products, bipolar scales ranking meat groups according to product characteristics, bipolar scales ranking product characteristics, and demographic questions.

The consumption questions 4 and 6 had scales of 1-7 allowing a choice for people who felt they had "average" consumption. All other semantic differential scale questions had scales of 1-6, which prevents people from choosing a neutral stance, and forces them to lean to one side of the scale or another.

Six hundred people responded to the survey, a 20 percent response rate. Only 5 surveys were returned because of bad addresses, and 4 were returned but not completed because of illness or vegetarian beliefs. Many respondents included unsolicited responses in the margins and on the back of the survey. These responses were recorded and categorized in Appendix A.

Frequencies and means are reported and described in the following sections of this paper. A series of Duncan and Least Significant Difference (LSD) tests were run to determine significant differences in all pairs of means (Snedecor, and Cochran, p.272). In all cases, the Duncan and LSD results supported each other; the results are shown in the tables and described in the text. Chi-square tests were done to determine significance of relationships between product attributes and incentive factors for increasing meat consumption, and demographic characteristics. These results are

presented in tables and relationships are described based on the analyses of the chi-square contingency tables.

Results

The questionnaire has 21 questions. For discussion purposes, groups of questions are discussed separately but are in the order that the questionnaire was written.

Meat Consumption Patterns

Table I presents a summary of the responses to the first six questions. Non-meat eaters did not complete the questionnaire. Among the respondents, some prepare meals for themselves only, but the highest percentages prepare for themselves and a spouse or themselves and family. Frequency of meat purchase is almost even across the categories (Question 3).

Most people consider themselves average or above on their knowledge of meat when compared to the "average" consumer as indicated by the mean response to Question 4. The percentage of the respondents that gave each of the answers is shown in Table I. The mean number of meals prepared in the home from 0 to 21 is 10.536. The mean number of meals eaten away from home per week is 6.179. Compared to the average household's consumption of meat, nearly three-fourths indicate that they are average or above (Question 6).

Table 1. Responses to Questions About Meat Consumption and Meal Preparation.

1. Do you or other members of your family eat meat? 100% YES 0% NO 0% NR

2. Generally, who do you prepare meals for?

   23.3% YOURSELF ONLY 38.7% YOURSELF & SPOUSE

   37.7% YOURSELF & FAMILY .3% DO NOT PREPARE MEALS AT HOME

3. How often do you purchase meat?

.5%	32.4%	3-5.8%	31.4%	1.7%
NEVER	1-2/MONTH	3-5/MONTH	6 OR MORE/MONTH	NR

4. Compared to the average consumer, I am very knowledgeable about meat.

STRONGLY DISAGREE						STRONGLY AGREE	
1	2	3	4	5	6	7	NR
1.5%	3.3%	5.3%	27.7%	27.0%	19.3%	15.8%	3.2%

MEAN = 4.966

5a. Assuming there are 21 meals in a week, at how many meals would one or more of your family members consume meat at home?
_____ (Give a number from 0 to 21.)

MEAN = 10.536
NR = 2.7%

5b. Assuming there are 21 meals in a week, at how many meals would one or more of your family members consume meat away from home?
____ (Give a number from 0 to 21.)

MEAN = 6.179
NR = .5%

6. Compared to the average household, how would you rate your household's consumption of meat?

LOW							HIGH
1	2	3	4	5	6	7	NR
4.2%	7.7%	14.4%	30.4%	21.2%	13.5%	8.5%	.3%

MEAN = 4.311

Meat Freezing, Preparation, and Health-consciousness

Question 7 responses about home freezing of meat and its impacts on quality are shown in Table II. Most people freeze meat after purchase, with only 12.4 percent indicating they do not. Nearly half "strongly agree" with freezing meat after purchase. They also agree that "preparing meals consumes time", and that "hard work is good for you". All three of these response categories have ratings that are not significantly different from one-another according to the Duncan and LSD tests. When consumers are asked if they are very health conscious, less than one-fifth moderately to strongly disagree while the majority of respondents strongly to moderately agree that they are very health conscious. The health consciousness question received a significantly different degree of agreement rating in comparison to the other statements. The next statement, "I keep meat fresh until eaten", received significantly different ratings, as well. When asked to respond to the statement "I never purchase frozen meat.", the largest showing is in the "strongly disagree" category, and the other responses are about evenly dispersed across the other five choices. The mean rating to this statement is significantly different from the other responses in question 7. There is strong disagreement to the statements that "frozen meat has unappealing color" and "frozen meat is less nutritious"; these two responses received ratings that are not significantly different from each other. Almost everyone disagrees with the statements that "frozen meat does not taste good", and "frozen meat is of poor quality", and these statements are not significantly different from one-another. Overall, it appears that consumers show no distinct adversity to freezing meat products, and are also quite "health-conscious".

One of the more specific questions on the survey is number 8, in which respondents rank interest in fifteen meat products. Extra lean ground beef (10 percent fat) has the highest interest rating, (mean of 6.747) and nearly half of all respondents are "extremely interested" and only about 10 percent are disinterested. According the Duncan and LSD tests the rating for extra lean ground beef is significantly different from all other product ratings. Extra lean pork has one of the highest means overall, and has a very low percentage of responses in the disinterested categories. The mean rating of interest for extra lean pork is significantly different from all others, as well. Lean branded beef steaks relatively high mean, and the largest percentage of respondents selected the top three categories of interest levels. This product is not significantly different from low fat (pork) frankfurters (97 percent fat free) which seem to have the largest responses in the extremes of the seven-point scale. Farm raised (fresh) catfish filets also have the largest percentages at the extremes, but have a relatively high mean which indicates interest in the product. Vacuum packaged fresh beef roasts/steaks are not significantly different from catfish filets, and one-fifth (the highest percentage) of all respondents are "not at all interested". In the case of whole fresh (not frozen turkey), most of the responses are either extremely interested or not at all interested. The largest percentage shown for ground turkey is in the not at all interested category. The two turkey products are not significantly different for level of interest. Ground turkey is not significantly different from the next grouping of products, either. Ground turkey, smoked whole chicken, polish sausage and smoked roast beef are not significantly different from each other. Smoked whole

chickens have most choosing (1) for not at all interested. Polish sausage (pork and beef) has a relatively low interest rating with the largest response, once again, in the "not at all" interested category. Nearly one third of all respondents indicate they are not at all interested in smoked roast beef.

Table 2. Responses to Questions About Meat Freezing and its Impacts on Quality.

7. Please indicate your degree of agreement with the following statements by circling 6 if you strongly agree and 1 if you strongly disagree, or somewhere in between depending on your degree of agreement with the statement.

	DUNCAN	STRONGLY AGREE					STRONGLY DISAGREE	
I freeze meat after purchase.		6	5	4	3	2	1	NR
MEAN = 4.983	A	49.2%	23.4%	15%	5.5%	2.7%	4.2%	.8%
I am very health-conscious.		6	5	4	3	2	1	
MEAN = 4.595	B	29.5%	23.7%	29.2%	13.1%	3.6%	1.0%	1.7%
I never buy frozen meat.		6	5	4	3	2	1	
MEAN = 3.019	D	14.5%	11.7%	11.0%	16%	17.6%	29.2%	1.3%
Hard work is good for you.		6	5	4	3	2	1	
MEAN = 4.893	A	41.7%	27.1%	17.4%	8.3%	3.4%	2.0%	2.2%
I keep meat fresh until eaten.		6	5	4	3	2	1	
MEAN = 3.414	C	20.8%	12.2%	12.6%	16.4%	18.2%	19.9%	4.5%
Frozen meat is less nutritious.		6	5	4	3	2	1	
MEAN = 2.416	E	4.1%	7.6%	11.6%	15.9%	24.0%	36.8%	3.5%
Preparing meals consumes time.		6	5	4	3	2	1	
MEAN = 4.932	A	48.6%	22.7%	14.1%	6.6%	4.1%	3.9%	2.2%
Frozen meat does not taste good.		6	5	4	3	2	1	
MEAN = 2.193	F	4.1%	3.6%	10.6%	13.3%	26.2%	42.2%	2.2%
Frozen meat has unappealing color.		6	5	4	3	2	1	
MEAN = 2.476	E	5.8%	5.9%	12.2%	16.3%	25.9%	33.9%	1.7%
Frozen meat is of poor quality.		6	5	4	3	2	1	
MEAN = 2.005	F	2.9%	3.0%	7.1%	13.8%	25.3%	48.0%	1.0%

Smoked roast beef is not significantly different from vacuum packaged marinated chicken. Vacuum packaged marinated chicken has a relatively low mean and over one-third chose (1) for not at all interested. Precooked and seasoned roast beef/steaks have nearly 50 percent responding "not at all interested" and this product has a significantly different rating from all other products. Buffalo jerky has a very low mean of 2.007, with nearly two-thirds of the people choosing (1) for not at all interested and its rating is significantly different, also. Fish sausage has a low mean and a significantly different rating from all other products. The products that use the word "lean" seem to fare the best, while "smoked" products or pork and beef products that do not specify the word "lean" do not do as well. Vacuum packaged fresh beef roasts/steaks received a much higher interest rating than did vacuum packaged marinated chicken.

Table 3. Interest in Specific Products

8. Please rate your interest in purchasing the following meat products by circling 8 if you find the product extremely interesting and 1 if the product doesn't interest you at all, or somewhere in between depending on your degree of interest in the product.

DUNCAN	EXTREMELY INTERESTED							NOT AT ALL INTERESTED	
Whole fresh (not frozen) turkey	8	7	6	5	4	3	2	1	NR
MEAN = 4.183 E	17.1%	7.5%	9.2%	13.4%	6.9%	11.0%	11.9%	23.1%	.3%
Smoked roast beef	8	7	6	5	4	3	2	1	
MEAN = 3.750 G F	7.5%	8.7%	10.6%	14.1%	8.7%	12.2%	10.4%	27.8%	.5%
Smoked whole chickens	8	7	6	5	4	3	2	1	
MEAN = 3.889 F	9.9%	9.4%	10.5%	12.9%	10.2%	9.5%	9.7%	27.9%	2.0%
Polish sausage (pork and beef)	8	7	6	5	4	3	2	1	
MEAN = 3.819 F	8.2%	7.8%	12.5%	11.1%	10.6%	13.1%	12.8%	23.9%	2.0%

Table 3. Interest in Specific Products

8. Please rate your interest in purchasing the following meat products by circling 8 if you find the product extremely interesting and 1 if the product doesn't interest you at all, or somewhere in between depending on your degree of interest in the product.

DUNCAN	EXTREMELY INTERESTED							NOT AT ALL INTERESTED
Buffalo jerky	8	7	6	5	4	3	2	1
MEAN = 2.007 I	2.1%	2.8%	2.9%	3.6%	4.5%	7.2%	12.7%	64.2% 3.0%
Lean branded beef steaks	8	7	6	5	4	3	2	1
MEAN = 5.126 C	20%	16.6%	16.2%	12.1%	8.4%	6.1%	6.7%	14.0% 2.0%
Fish sausage	8	7	6	5	4	3	2	1
MEAN = 1.670 J	2.2%	2.4%	1.4%	1.5%	3.6%	2.9%	7.1%	78.8% 3.0%
Extra lean ground beef (10% fat)	8	7	6	5	4	3	2	1
MEAN = 6.747 A	45.7	23.2%	14.5%	6.5%	3.8%	2.0%	1.5%	2.7% 2.0%
Low fat (pork) frankfurter (97% fat-free)	8	7	6	5	4	3	2	1
MEAN = 5.047 C	22.6%	17.2%	12.6%	9.6%	8.1%	5.6%	6.2%	18.0% 1.0%
Precooked and seasoned roast beef/steaks	8	7	6	5	4	3	2	1
MEAN = 2.794 H	3.2%	5.3%	6.1%	11.2%	6.0%	8.5%	14.5%	45.1% 2.0%
Farm raised (fresh) catfish filets	8	7	6	5	4	3	2	1
MEAN = 4.694 D	21.8%	15.4%	10.3%	8.6%	5.4%	7.3%	7.9%	23.3% 1.0%
Vacuum packaged fresh beef roasts/steaks	8	7	6	5	4	3	2	1
MEAN = 4.409 D	13.5%	13.4%	13.4%	11.5%	9.6%	9.0%	6.3%	23.4% 2.0%
Vacuum packaged marinated chicken	8	7	6	5	4	3	2	1
MEAN = 3.507 G	7.6%	8.6%	11.0%	9.2%	8.5%	9.3%	9.7%	36.1% 2.0%
Extra lean pork	8	7	6	5	4	3	2	1
MEAN = 5.604 B	24.2%	21.6%	15.9%	11.4%	7.4%	5.4%	3.5%	10.7% .3%
Ground turkey	8	7	6	5	4	3	2	1
MEAN = 4.078 E F	13.9%	10.5%	11.2%	8.5%	10.4%	7.8%	11.0%	26.7% .1%

When asked to rank seven meat categories on a scale of one to six according to "taste" in Question 9, chicken has the highest mean with two-thirds choosing (6) for

very good, and based on the Duncan and LSD tests, it is significantly different from the other meat groups. Beef is next followed closely by turkey and then fish. Pork falls behind all of the white meats including fish, and is followed by veal and finally lamb. All of the meat groups were significantly different from each other (Table 4).

The respondents ranked the seven meats according to nutritional value and they indicate fish as the most nutritious, but fish is followed very closely by chicken and they are not significantly different, based on the Duncan and LSD results. Turkey is not significantly different from chicken. There is a drop in means from the fish and poultry groups to beef which is significantly different and veal which is also significantly different. There is another decrease in means to pork and lamb which are not significantly different from one another. Respondents clearly distinguish between the white and red meats; there are lines drawn between the various red meat categories as well (Table 4).

Based on economical value, chicken is the obvious choice, and is significantly different from the others. Turkey is next and is also significantly different.Fish and beef are not considered significantly different from each other. Pork is next and is significantly different from the other meat groups. Veal and lamb are considered the least economical and are not significantly from each other (Table 4).

Table 4. Responses to Taste, Nutritional Value, and Economical Value of Seven Meat Groups.

9. Please rate each of the following types of meat in terms of their **taste, nutritional value, and economical value** by marking a 6 if your feel the meat is very good and 1 if the meat is very poor, or somewhere between.

TASTE

	DUNCAN	VERY POOR						VERY GOOD
BEEF		1	2	3	4	5	6	NR
MEAN = 5.250	B	1.0%	1.3%	3.9%	13.4%	26.2%	54.4%	.7%
CHICKEN		1	2	3	4	5	6	
MEAN = 5.486	A	1.2%	.5%	1.5%	7.7%	23.5%	65.5%	.8%
FISH		1	2	3	4	5	6	
MEAN = 4.773	D	4.6%	5.2%	8.1%	16.1%	22.3%	43.7%	2.0%
LAMB		1	2	3	4	5	6	
MEAN = 3.106	G	25%	15.1%	19.5%	17.1%	11.1%	12.1%	5.0%
PORK		1	2	3	4	5	6	
MEAN = 4.560	E	4.6%	4.9%	10.2%	21.0%	28.5%	30.7%	2.0%
TURKEY		1	2	3	4	5	6	
MEAN = 5.045	C	2.2%	3.0%	6.6%	11.8%	29.2%	47.2%	2.0%
VEAL		1	2	3	4	5	6	
MEAN = 3.809	F	15.6%	10.3%	13.1%	21.6%	17.2%	22.2%	.8%

NUTRITIONAL VALUE

		VERY POOR						VERY GOOD
BEEF		1	2	3	4	5	6	NR
MEAN = 4.556	C	1.7%	4.7%	9.8%	29.5%	28.5%	25.8%	2.0%
CHICKEN		1	2	3	4	5	6	
MEAN = 5.496	A B	.5%	.8%	1.2%	5.7%	29.6%	62.2%	.8%
FISH		1	2	3	4	5	6	
MEAN = 5.587	A	.3%	.5%	2.5%	4.4%	21.2%	71%	1.0%
LAMB		1	2	3	4	5	6	
MEAN = 3.926	E	7.9%	7.7%	19.6%	28.6%	20.9%	15.3%	7.0%
PORK		1	2	3	4	5	6	
MEAN = 3.949	E	8.0%	9.4%	16.3%	28.7%	21.3%	16.3%	2.0%
TURKEY		1	2	3	4	5	6	
MEAN = 5.405	B	.3%	1.2%	3.2%	7.8%	28.0%	59.5%	1.0%
VEAL		1	2	3	4	5	6	
MEAN = 4.226	D	6.0%	6.0%	13.1%	29.8%	24.9%	20.3%	5.0%

Table 4. Responses to Taste, Nutritional Value, and Economical Value of Seven Meat Groups.

9. Please rate each of the following types of meat in terms of their taste, nutritional value, and economical value by marking a 6 if your feel the meat is very good and 1 if the meat is very poor, or somewhere between.

		ECONOMICAL VALUE						
		VERY POOR						VERY GOOD
BEEF		1	2	3	4	5	6	NR
MEAN = 4.175	C	3.1%	6.8%	14.1%	36.3%	25.1%	14.6%	2.0%
CHICKEN		1	2	3	4	5	6	
MEAN = 5.346	A	.7%	1.2%	3.0%	10.0%	28.2%	56.9%	1.0%
FISH		1	2	3	4	5	6	
MEAN = 4.233	C	5.1%	7.8%	14.5%	25.2%	25.9%	21.5%	2.0%
LAMB		1	2	3	4	5	6	
MEAN = 2.673	E	26.4%	21.3%	24.4%	18.5%	5.6%	3.8%	8.0%
PORK		1	2	3	4	5	6	
MEAN = 4.028	D	4.5%	5.5%	20.0%	35.5%	22.0%	12.6%	3.0%
TURKEY		1	2	3	4	5	6	
MEAN = 5.141	B	.5%	2.4%	4.6%	14.9%	30.2%	47.4%	2.0%
VEAL		1	2	3	4	5	6	
MEAN = 2.735	E	26.0%	20.4%	22.1%	20.9%	6.7%	3.9%	5.0%

When respondents rank the level of fat, pork is highest with a mean of 4.672 followed closely by beef (4.590); pork and beef are not significantly different from each other according to the Duncan and LSD tests. There is a considerable drop in mean with lamb (3.809) which is significantly different, and then veal (3.259) which is also significantly different from the other meat categories. Chicken is next followed by turkey and fish as the lowest in fat with over half choosing (1) for low fat. All three of these meat groups are significantly different from all other meat groups.

Table 5. Responses to Level of Fat Across Seven Meat Groups.

10. Please rate each of the following types of meat in terms of level of fat by marking a 6 if you feel the meat has a high level of fat and 1 if the meat has a low level of fat, or somewhere in between depending level of fat within meat.

		LEVEL OF FAT						
	DUNCAN	LOW FAT						HIGH FAT
BEEF		1	2	3	4	5	6	NR
MEAN = 4.590	A	3.2%	3.0%	9.5%	26.5%	31.4%	26.4%	1.0%
CHICKEN		1	2	3	4	5	6	
MEAN = 2.465	D	30.4%	29.8%	18.5%	9.4%	7.8%	4.0%	1.0%
FISH		1	2	3	4	5	6	
MEAN = 1.766	F	56.5%	28.6%	6.9%	1.7%	2.2%	4.1%	2.0%
LAMB		1	2	3	4	5	6	
MEAN = 3.809	B	4.0%	9.0%	27.2%	32.3%	16.9%	10.6%	9.0%
PORK		1	2	3	4	5	6	
MEAN = 4.672	A	1.5%	3.3%	12.9%	22.5%	28.4%	31.4%	3.0%
TURKEY		1	2	3	4	5	6	
MEAN = 2.141	E	39.5%	32.0%	14.1%	7.5%	3.4%	3.6%	2.0%
VEAL		1	2	3	4	5	6	
MEAN = 3.259	C	13.0%	14.7%	29.6%	25.4%	25.4%	10.9%	5.0%

Beef and chicken have almost identical means (5.273 and 5.269 respectively) for convenience and ease of preparation, and based on the Duncan and LSD results, are not significantly different. Fish, turkey and pork followed, and are not significantly different from each other. Veal is next and it is considered significantly different from the others. Lamb is the least convenient and is significantly different, as well.

Table 6. Ranking of Convenience/Ease of Preparation Across Seven Meat Groups.

11. Please rate each of the following types of meat in terms of their convenience/ease to prepare by marking a 6 if you feel the meat is very convenient/easy to prepare and 1 if the meat is very inconvenient/difficult to prepare, or somewhere in between depending on how convenient/easy to prepare you feel the meat is.

		CONVENIENCE/EASE OF PREPARATION						
	DUNCAN	VERY DIFFICULT						VERY EASY
BEEF		1	2	3	4	5	6	NR
MEAN = 5.273	A	.5%	1.5%	4.8%	10.2%	29.3%	53.7%	.3%
CHICKEN		1	2	3	4	5	6	
MEAN = 5.269	A	.8%	1.0%	4.0%	12.7%	27.5%	53.9%	.2%
FISH		1	2	3	4	5	6	
MEAN = 4.695	B	2.5%	5.2%	11.8%	19.9%	21.9%	38.7%	1.0%
LAMB		1	2	3	4	5	6	
MEAN = 3.212	D	18.1%	17.9%	20.6%	23.0%	9.1%	11.3%	9.0%
PORK		1	2	3	4	5	6	
MEAN = 4.616	B	2.9%	4.8%	10.2%	23.1%	28.2%	30.9%	2.0%
TURKEY		1	2	3	4	5	6	
MEAN = 4.686	B	1.7%	6.5%	12.1%	18.5%	23.7%	37.6%	.7%
VEAL		1	2	3	4	5	6	
MEAN = 3.802	C	12.0%	11.4%	19.1%	19.1%	18.7%	19.6%	7.0%

Respondents ranked several features of meat from (1) not at all important to (6) extremely important. Taste has a high mean with an overwhelming 86.4 percent ranking taste (6). Quality has a high mean, also, and according to the Duncan and LSD results, is not significantly different from taste. Less than 1 percent indicate it is not important. Packaging is the least important of all with a mean of 3.940 and it is significantly different from all other characteristics. Nutritional value is at least moderately important to almost all respondents. Nutritional value is not, however,

quite as high as taste, or quality. Nutritional value is not significantly different from either tenderness, economical value, or level of fat. Color is important to most respondents as is economical value; these two characteristics are not significantly different from one another. Tenderness has a mean of 5.492 and 62.5 percent chose "extremely important". Convenience and ease of preparation has a somewhat lower mean of 4.928, and is significantly the same as versatility and shelf-life. Less than 10 percent indicated that level of fat is moderately to not at all important. Respondents show level of fat as being very important over all, and it is not significantly different from nutritional value.

Consumers were asked to rate the importance of several incentive factors for increasing consumption of meat products. Less fat is the most important with a mean of 5.207, and based on the Duncan and LSD tests, is significantly different from all other factors. The Duncan and LSD results show that availability and lower price are not significantly different, and neither are nutritional labeling and lower price. Cooking instructions seem to be the least important and significantly different with a mean of 3.623.

Demographics

Nearly three-fourths of those surveyed are female (Question 14). The age category takes into consideration all of the family members of the respondents. There is an even dispersion across the age groups except for the 46-60 group which has a somewhat higher percentage of 26.9 percent (Question 15). Most of the respondents

Table 7. Importance of Meat Product Characteristics.

12. Please indicate how important each of the following features of meat are to you by circling a 6 if the feature is extremely important, a 1 if the feature is not at all important or somewhere in between depending on how important the feature is to you.

DUNCAN		EXTREMELY IMPORTANT					NOT AT ALL IMPORTANT	
TASTE		6	5	4	3	2	1	NR
MEAN = 5.833	A	86.4%	11.5%	1.5%	.3%	.2%	.2%	0%
PACKAGING		6	5	4	3	2	1	
MEAN = 3.940	F	25.6%	15.7%	20.2%	14.7%	13%	10.7%	.3%
NUTRITIONAL VALUE		6	5	4	3	2	1	
MEAN = 5.366	B C	56.7%	27.4%	13.4%	1.2%	1.0%	.3%	.3%
COLOR		6	5	4	3	2	1	
MEAN = 5.076	D	47.2%	25.5%	18.7%	5.4%	2.5%	.7%	.8%
ECONOMICAL VALUE		6	5	4	3	2	1	
MEAN = 5.087	D	47.1%	26.8%	16.8%	6.2%	2.9%	.2%	.7%
VERSATILITY		6	5	4	3	2	1	
MEAN = 4.898	E	38.7%	27.3%	23.4%	7.0%	2.7%	.8%	2.0%
TENDERNESS		6	5	4	3	2	1	
MEAN = 5.492	B	62.5%	26.9%	8.4%	1.7%	.5%	0%	.8%
CONVENIENT/EASE TO PREPARE		6	5	4	3	2	1	
MEAN = 4.928	E	39.1%	29.7%	21.3%	6.2%	2.2%	1.5%	.7%
SHELF-LIFE		6	5	4	3	2	1	
MEAN = 4.779	E	41.9%	23.6%	17.5%	8.1%	5.4%	3.5%	1.0%
QUALITY		6	5	4	3	2	1	
MEAN = 5.742	A	78.9%	17.4%	3.4%	0%	0%	.3%	.5%
LEVEL OF FAT		6	5	4	3	2	1	
MEAN = 5.289	C	59.3%	19.9%	14.2%	4.7%	1.2%	.8%	.2%

Table 8. Consumers' Evaluations of the Importance of Factors Influencing Decisions to Purchase More Meat.

13. Please indicate the importance of each of the following factors for increasing your consumption of meat products. Circle a 6 if the feature is important, a 1 if the feature is not important, or somewhere in between depending on how important the feature is to you.

	DUNCAN	EXTREMELY IMPORTANT					NOT AT ALL IMPORTANT	
LOWER PRICE		6	5	4	3	2	1	NR
MEAN = 4.803	B C	42.5%	21.8%	20.3%	6.6%	6.2%	2.5%	.2%
AVAILABILITY		6	5	4	3	2	1	
MEAN = 4.904	B	43.0%	26.2%	18.4%	6.1%	3.0%	3.2%	2.0%
NUTRITIONAL LABELING		6	5	4	3	2	1	
MEAN = 4.706	C	41.2%	21.8%	18.6%	7.3%	7.1%	4.1%	1.0%
LESS FAT	A	6	5	4	3	2	1	
MEAN = 5.207		57.3%	20.7%	12.8%	5.4%	1.9%	1.9%	1.0%
COOKING INSTRUCTIONS/ RECIPES		6	5	4	3	2	1	
MEAN = 3.623	D	22.5%	15.4%	18.6%	13.5%	12.7%	17.4%	1.0%

have attained at least 10th grade level of education with 42.4 percent having attended college and one-fourth of them with a graduate or professional degree (Question 16).

Nearly three-fourths of those surveyed are married (Question 17). Most are white (89.1 percent), and the most noticeable ethnic showing is Native American, followed by Afro-American (Question 18). The highest percentage of people are white-collar (42.4 percent) or retired (26.6 percent) (Question 19). Spouses occupation has almost the same distribution as occupation (Question 20). The mean income falls in the $40,000-49,000 category, but actually, the percentages show a pretty even dispersion across all income levels (Question 21).

Table 9. Consumers' Responses to Demographic Questions.

14. Are you male 26.1% or female 73.9% ? NR 1.0%

15. Put a number in the boxes below indicating how many people in each of the age categories consume five or more meals in you household each week.

13.2%	6.9%	13.8%	3.8%	7.2%	15.7%	26.9%	9.2%	3.4%
0-5	6-10	11-18	19-24	25-35	36-45	46-60	61-75	75+
Age Category in Years								

16. Check in the appropriate box below, the highest level of education you have attended.

.2%	1.2%	20.5%	10.7%	42.4%	25.0%
Grade School, K-6th	7th, 8th, 9th	10th, 11th, 12th High School	Trade School, Vocational, Training	Four years or less of College	Graduate or Professional Degree

17. What is your marital status? 28.1% SINGLE 71.9% MARRIED .3% NR

18. What is your ethnic background?

3.7% Afro-American .2% Asian 1.0% Hispanic

6.0% Native American 0% Pacific Islander 89.1% White

.7% NR

19. What is your occupation?

42.4% White-Collar 9.1% Blue-Collar 19.8% Homemaker

1.3% Student 1.0% Unemployed 26.6% Retired
.8% NR

20. What is your spouse's occupation?

48.6% White-Collar 15.4% Blue-Collar 6.1% Homemaker

.7% Student 2.1% Unemployed 27.1% Retired

.8% NR

Table 9. Consumers' Responses to Demographic Questions.

21. What is your household's approximate gross annual income?

4.1% UNDER $10,000	11.5% $50,000-59,999
10.5% $10,000-19,999	6.7% $60,000-69,999
16.4% $20,000-29,999	6.5% $70,000-79,999
16.6% $30,000-39,999	4.0% $80,000-89,999
13.5% $40,000-49,999	10.3% $90,000+
7.5% NR	

Chi-square Results

A series of chi-square tests are performed to determine whether there are significant relationships between the ratings of product attributes (see Question 12 Table 7) and demographics. The same procedure is followed using factors from Question 13 (Table 8) which compares factors for increasing consumption of meat products and demographics. A 5 percent confidence level is used to test the null hypothesis which states that there is no significant relationship between the attribute/factor and the corresponding demographic variables. When significance is present, contingency tables are studied to determine the nature of the relationship. The results are presented in the following tables and discussion.

There are very significant differences in importance ratings of meat product attributes between genders. Females tend to demonstrate higher importance ratings than males in all categories except economical value which shows no significant

difference between males and females. These results might indicate that females are higher-involvement meat consumers than males (Table 10).

Table 10. Tests of the Relationships Between Ratings of Product Attributes and Gender

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Taste	1	3.124	0.077
Packaging	5	14.243	0.014
Nutritional Value	2	28.155	0.000
Color	3	22.399	0.000
Economical Value	3	7.621	0.055
Versatility	3	14.308	0.003
Tenderness	2	22.631	0.000
Convenient/Ease to Prepare	3	9.775	0.021
Shelf-life	3	20.771	0.000
Quality	1	6.188	0.013
Level of Fat	2	11.035	0.004

Table 11. Tests of the Relationships Between Ratings of Product Attributes and Family Size.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Taste	4	1.939	0.747
Packaging	20	23.220	0.278
Nutritional Value	8	2.385	0.967
Color	12	21.252	0.047
Economical Value	12	20.558	0.057
Versatility	12	14.380	0.277
Tenderness	8	18.192	0.020
Convenient/Ease to Prepare	12	29.444	0.003
Shelf-life	12	24.059	0.020
Quality	4	10.664	0.031
Level of Fat	8	8.387	0.397

There are some significant relationships between family size and ratings of meat product characteristics. Tenderness is significantly more important to families with only one person, and less important to families of 4 or more. Convenience is more important to single households, as well, and less important to two-person families. Shelf-life is less important to two-person families, but slightly more important to singles. This could be because of the fact that many single person families are retired and these people tend to be higher-involvement consumers who rate most characteristics as being more important. Quality is significantly more important to single households, and less important to families with 4 or more members. Color is significant, but cannot be explained well by using the contingency tables. The differences that accounted for the significance occurred in the middle categories (moderate to neutral levels of interest) not in the extremes. There are no significant differences between family size and ratings of taste, packaging, nutritional value, economic value, versatility, and level of fat were (Table 11).

Table 12. Tests of the Relationships Between Ratings of Product Attributes and Presence of Children.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Taste	1	3.604	0.058
Packaging	5	14.808	0.011
Nutritional Value	2	2.776	0.246
Color	3	11.931	0.008
Economical Value	3	2.814	0.421
Versatility	3	6.530	0.088
Tenderness	2	9.540	0.008
Convenient/Ease to Prepare	3	9.355	0.025
Shelf-life	3	6.773	0.080
Quality	1	3.586	0.058
Level of Fat	2	2.691	0.260

There are some significant differences between families with or without children and product characteristics. Packaging, color, and tenderness are more important to families with no children. Convenience is significant, but a story can not be told judging from the contingency tables. The differences in percentages occur in the middle of the interest categories and not at the extreme or outer boundaries of the interest categories (Table 12).

Table 13. Tests Between Ratings of Product Attributes and Level of Education.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Taste	2	15.266	0.000
Packaging	10	41.357	0.000
Nutritional Value	4	26.164	0.000
Color	6	36.512	0.000
Economical Value	6	39.148	0.000
Versatility	6	28.047	0.000
Tenderness	4	28.509	0.000
Convenient/Ease to Prepare	6	17.164	0.009
Shelf-life	6	69.968	0.000
Quality	2	21.427	0.000
Level of Fat	4	25.793	0.000

There are definitely significant differences in the relationship between level of education and product attributes. Lower education levels (high school and or trade school) indicate a significantly higher importance rating for taste, packaging, nutritional value, color, economical value, versatility, tenderness, convenience, shelf-life, quality, and level of fat. Respondents with a graduate or professional degree tend to show significantly lower importance ratings for all of these categories. Nutritional labeling is the only attribute which shows no significant difference across education levels; it is important to all. The importance ratings of meat product

attributes being significantly higher for lower education levels could be an indication that they are higher-involvement consumers. This could represent the fact that they might tend to spend a greater percentage of their income on food (Table 13).

Table 14. Tests of the Relationships Between Ratings of Product Attributes and Marital Status.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Taste	1	0.442	0.506
Packaging	5	10.155	0.071
Nutritional Value	2	0.774	0.679
Color	3	2.856	0.414
Economical Value	3	4.753	0.191
Versatility	3	6.817	0.078
Tenderness	2	3.811	0.149
Convenient/Ease to Prepare	3	1.153	0.764
Shelf-life	3	4.335	0.227
Quality	1	1.817	0.178
Level of Fat	2	3.570	0.168

Table 15. Relationships Between Ratings of Product Attributes and Ethnic Background.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Taste	1	1.192	0.275
Packaging	5	15.423	0.009
Nutritional Value	2	0.812	0.666
Color	3	11.771	0.008
Economical Value	3	11.223	0.011
Versatility	3	9.465	0.024
Tenderness	2	14.655	0.001
Convenient/Ease to Prepare	3	19.837	0.000
Shelf-life	3	8.704	0.033
Quality	1	3.487	0.062
Level of Fat	2	1.971	0.373

There is no significant difference between importance ratings for any meat product attributes and marital status (Table 14).

There are significant differences between whites and non-whites in terms of importance ratings of meat product attributes. However, taste, nutritional value, quality, and fat level show no significant differences. Non-whites indicate a significantly higher importance rating for packaging, color, economical value, versatility, tenderness, convenience, and shelf-life (Table 15).

Table 16. Relationships Between Ratings of Product Attributes and Occupation.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Taste	3	17.136	0.001
Packaging	15	27.382	0.026
Nutritional Value	6	17.890	0.007
Color	9	32.117	0.000
Economical Value	9	21.696	0.010
Versatility	9	10.175	0.337
Tenderness	6	18.190	0.006
Convenient/Ease to Prepare	9	13.166	0.155
Shelf-life	9	22.287	0.008
Quality	3	8.548	0.036
Level of Fat	6	22.129	0.001

The relationships between ratings of product attributes and occupation are shown in Table 16. Occupations are divided into four groups: white-collar, blue-collar, retired, and other. Taste is slightly less important to white-collar and retired respondents, while more important to blue-collar and others (unemployed, student, homemaker). Packaging has significantly higher ratings from retired respondents and lower ratings from white-collar respondents. Retired and "other" respondents indicate

that nutritional value is of higher importance and white-collar respondents indicate that it is less important. Color is significantly more important to retired people while less important to white-collar respondents. Economical value is significantly more important to all groups except white-collar. There are no significant differences in terms of versatility. Tenderness is more important to retired and less important to blue-collar respondents. Convenience is not significant. Shelf-life is more important to all groups except white-collar. Quality is more important to retired and less important to white-collar respondents. Level of fat is more important to retired and "other" and less important to white-collar (Table 16).

Table 17. Relationships Between Ratings of Product Attributes and Spouse's Occupation.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Taste	3	1.136	0.769
Packaging	15	24.704	0.054
Nutritional Value	6	15.375	0.018
Color	9	23.642	0.005
Economical Value	9	11.466	0.245
Versatility	9	20.936	0.013
Tenderness	6	26.581	0.000
Convenient/Ease to Prepare	9	17.989	0.035
Shelf-life	9	30.504	0.000
Quality	3	10.927	0.012
Level of Fat	6	16.658	0.011

Ratings of taste, packaging, and economical value are not significantly related to spouse's occupation. Nutritional value is more important when the spouse is retired. Color is less important if spouse is white-collar and more important when retired. Versatility is less important to white-collar and more important when spouse is blue-

collar or retired. Tenderness, convenience, shelf-life quality, and level of fat are more important if the spouse is retired and less if the spouse is white-collar (Table 17).

Table 18. Relationships Between Ratings of Product Attributes and Income.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Taste	4	4.503	0.342
Packaging	20	55.378	0.000
Nutritional Value	8	19.126	0.014
Color	12	30.006	0.003
Economical Value	12	52.731	0.000
Versatility	12	35.076	0.000
Tenderness	8	33.845	0.000
Convenient/Ease to Prepare	12	24.737	0.016
Shelf-life	12	48.300	0.000
Quality	4	20.388	0.000
Level of Fat	8	18.194	0.020

Ratings of almost all meat product characteristics are significantly related to income, however, respondents show no significant differences in the relationship between taste and income. Packaging is more important to the less than $20,000 group and less important to the higher income groups. The less than $20,000 group indicate that nutritional value is significantly more important to them than to higher income groups. Color is more important to those people earning less than $40,000. Economical value is more important to those earning less than $40,00 and least important to those earning over $60,000. Those earning less than $40,000 indicate that versatility is more important to them than to higher income groups. Convenience, shelf-life, and quality are more important to those earning less than

$20,000, and less important to those earning over $60,000. Level of fat is most important to the less than $20,000 group (Table 18).

Table 19. Relationships Between Ratings of Factors That Increase Consumption of Meat Products and Gender.

Factor	Degrees of Freedom	Chi-Square Statistic	Probability Value
Lower Price	3	3.446	0.328
Availability	3	9.572	0.023
Nutritional Labeling	3	12.948	0.005
Less Fat	2	6.970	0.031
Cooking Instructions/Recipes	5	7.629	0.178

Importance ratings of some incentive factors for increasing meat consumption are found to be related to gender. All factors are significantly more important to females than to males with the exception of lower price and cooking instructions which are not significant (Table 19).

Table 20. Relationships Between Ratings of Factors That Increase Consumption of Meat Products and Family Size.

Factor	Degrees of Freedom	Chi-Square Statistic	Probability Value
Lower Price	12	17.178	0.143
Availability	12	12.603	0.399
Nutritional Labeling	12	11.330	0.501
Less Fat	8	10.106	0.258
Cooking Instructions/Recipes	20	24.251	0.232

Ratings of factors that may influence increasing meat consumption are not found to be related to family size (Table 20), presence of children (Table 21), or marital status (Table 22).

Table 21. Relationships Between Ratings of Factors That Increase Consumption of Meat Products and Presence of Children.

Factor	Degrees of Freedom	Chi-Square Statistic	Probability Value
Lower Price	3	2.875	0.411
Availability	3	1.178	0.758
Nutritional Labeling	3	3.011	0.390
Less Fat	2	3.700	0.157
Cooking Instructions/Recipes	5	8.005	0.156

Table 22. Relationship Between Ratings of Factors That Increase Consumption of Meat Products and Marital Status.

Factor	Degrees of Freedom	Chi-Square Statistic	Probability Value
Lower Price	3	2.916	0.405
Availability	3	4.005	0.261
Nutritional Labeling	3	4.182	0.242
Less Fat	2	4.675	0.097
Cooking Instructions/Recipes	5	8.969	0.110

Table 23. Relationships Between Ratings of Factors That Increase Meat Consumption and Level of Education.

Factor	Degrees of Freedom	Chi-Square Statistic	Probability Value
Lower Price	6	29.819	0.000
Availability	6	41.712	0.000
Nutritional Labeling	6	12.101	0.060
Less Fat	4	10.335	0.035
Cooking Instructions/Recipes	10	16.445	0.088

Ratings of factors for increasing meat consumption are found to be related to education. All factors are significantly more important to respondents with a high school or trade school level of education with the exceptions of nutritional labeling and cooking instructions which are not significant (Table 23).

Table 24. Relationships Between Ratings of Factors That Increase Consumption of Meat Products and Ethnic Background.

Factor	Degrees of Freedom	Chi-Square Statistic	Probability Value
Lower Price	3	9.801	0.020
Availability	3	12.395	0.006
Nutritional Labeling	3	7.199	0.066
Less Fat	2	3.299	0.192
Cooking Instructions/Recipes	5	28.301	0.000

Some factors that may increase meat consumption are rated differently by whites and non-whites. Non-whites indicate that lower price, availability, and cooking instructions are significantly more important to them. Nutritional labeling and level of fat are not significantly different for whites and non-whites, but are rated as being "important" to all (Table 24).

Table 25. Relationships Between Ratings of Factors That Increase Consumption of Meat Products and Occupation.

Factor	Degrees of Freedom	Chi-Square Statistic	Probability Value
Lower Price	9	22.204	0.008
Availability	9	25.512	0.002
Nutritional Labeling	9	11.739	0.228
Less Fat	6	13.157	0.041
Cooking Instructions/Recipes	15	21.394	0.125

Most ratings of factors that increase meat consumption are rated differently by respondents with different occupations. Lower price and availability are more important to all occupations except white-collar. Nutritional labeling shows no significant differences across occupations, but is "important" to all. Less fat is less important to white and blue-collar respondents, while more important to retired and other respondents. There is no significant difference in terms of cooking instructions (Table 25).

Table 26. Relationship Between Ratings of Factors That Increase Consumption of Meat Products and Spouse's Occupation.

Factor	Degrees of Freedom	Chi-Square Statistic	Probability Value
Lower Price	9	10.572	0.306
Availability	9	27.989	0.001
Nutritional Labeling	9	7.794	0.555
Less Fat	6	6.896	0.331
Cooking Instructions/Recipes	15	26.688	0.031

Most ratings of factors that may increase meat consumption are not significantly related to spouse's occupation. There are no significant differences in terms of lower price, nutritional labeling or less fat. Availability is more important to people with retired or blue-collar spouses. Cooking instructions appear to be slightly less important to white-collar respondents and more important to retired and other respondents (Table 26).

Table 27. Relationships Between Ratings of Factors That Increase Consumption of Meat Products and Income.

Factor	Degrees of Freedom	Chi-Square Statistic	Probability Value
Lower Price	12	51.571	0.000
Availability	12	54.622	0.000
Nutritional Labeling	12	19.552	0.076
Less Fat	8	15.002	0.059
Cooking Instructions/Recipes	20	43.933	0.002

Ratings of most factors that may increase meat consumption are found to be significantly related to income. Lower price is more important to people earning less than $40,000 and less important to those earning over $60,000. Availability is most important to those in the under $20,000 group. Nutritional labeling and less fat show no significant differences across income levels, but are "important" to all. Cooking instructions are more important to those earning less that $40,000 (Table 27).

Similar chi-square analyses are summarized in tables which indicate where significant differences occur. The chi-square tests were done between demographic questions and questions about meat handling procedures/attitudes (question 7) and interest in specific meat products (question 8). Tables 28-31 summarize the findings, and the individual chi-square statistics and degrees of freedom are shown in Appendix B, tables 32-49.

Responses to "I freeze meat after purchase", "I am very health conscious", "I believe hard work is good for you", and "Frozen meat is of poor quality/has unappealing color" are related to gender. Responses to health consciousness and whether or not frozen meat is less nutritious are found to be related to family size.

Meat related attitude responses were found to not be related to presence of children or ethnic background. The response to health consciousness is related to marital status (Table 28). There are some significant differences in the responses to freezing meat after purchase and frozen meat being less nutritious across education levels. Responses to frozen meat being less nutritious are related to occupation. None of the responses to question 7 are found to be related to spouse's occupation. Responses to "I freeze meat after purchase", "Preparing meals consumes time", "Frozen meat does not taste good", and "Frozen meat is of poor quality" are related to income (Table 29).

Interest ratings of specific products are found to be related to demographic characteristics of the respondents. Ratings of interest in smoked roast beef, smoked whole chickens, buffalo jerky, fish sausage, extra-lean ground beef, low-fat frankfurters, and precooked and seasoned roast beef/steaks are all significantly related to gender. Ratings of interest in vacuum packaged fresh beef roast/steaks, vacuum packaged marinated chicken, and ground turkey are significantly related to family size. Ratings of interest in smoked roast beef and smoked whole chicken are related to presence of children. Marital status does significantly effect the ratings of smoked roast beef, smoked whole chickens, buffalo jerky, precooked and seasoned roast beef/steaks, vacuum packaged fresh beef roasts/steaks, and vacuum packaged marinated chicken (Table 30).

Ratings of interest in smoked roast beef, precooked and seasoned beef steaks/roasts, and vacuum packaged chicken are all significantly related to education. Interest ratings of smoked roast beef, smoked whole chickens, buffalo jerky, fish

sausage, precooked and seasoned roast beef/steaks, vacuum packaged beef roasts/steaks, vacuum packaged marinated chicken, and ground turkey are related to occupation. Rating of interest in smoked roast beef, precooked and seasoned beef steaks/roasts, farm-raised fresh catfish, vacuum packaged roast beef/steaks, vacuum packaged marinated chicken, and ground turkey are related to spouse's occupation. The only product that has significantly different ratings across income levels is extra-lean ground beef (Table 31).

The significant differences in interest in specific products are not necessarily consistent with the significant differences shown in the ratings of product attributes that correspond with these types of products (as shown in previous chi-square tables and analysis). For example, there are significant differences depending on marital status in tables 28 and 30, however, marital status showed almost no significant differences in ratings of product attributes and characteristics.

Table 28. Summary of the Relationship Between Demographic Characteristics and Attitudes Toward Meat Handling and Nutrition.

	Demographic Characteristic				
Products	Gender	Family Size	Children Present	Race	Marital Status
I freeze meat after purchase.	*				
I am very health conscious.	*	*			*
I never buy frozen meat.					
Hard work is good for you.	*				
I keep meat fresh until eaten.					
Frozen meat is less nutritious.		*			
Preparing meals consumes time.					
Frozen meat does not taste good.					
Frozen meat has unappealing color.	*				
Frozen meat is of poor quality.					

* Chi-square results show that the relationship between the meat related attitude and the demographic characteristic was significantly different at the 5 percent confidence level.

Table 29. Summary of the Relationship Between Demographic Characteristics and Attitudes Toward Meat Handling and Nutrition (continued).

	Demographic Characteristic			
Products	Education	Occupation	Spouse Occupation	Income
I freeze meat after purchase.	*			*
I am very health conscious.				
I never buy frozen meat.				
Hard work is good for you.				
I keep meat fresh until eaten.				
Frozen meat is less nutritious.	*	*		
Preparing meals consumes time.				*
Frozen meat does not taste good.				*
Frozen meat has unappealing color.				
Frozen meat is of poor quality.				*

* Chi-square results show that the relationship between the meat related attitude and the demographic characteristic was significantly different at the 5 percent confidence level.

Table 30. Summary of the Relationship Between Demographic Characteristics and Specific Products.

	Demographic Characteristic				
Products	Gender	Family Size	Children Present	Race	Marital Status
Whole fresh, not frozen,turkey					
Smoked roast beef	*		*		*
Smoked whole chickens	*		*		*
Polish sausage					
Buffalo jerky	*				*
Lean branded beef steaks					
Fish Sausage	*				
Extra lean ground beef (10% fat)	*				
Low fat (pork) frankfurter (97% fat-free)	*				
Precooked and seasoned roast beef/steaks	*				*
Farm raised (fresh) catfish filets					
Vacuum packaged fresh beef roasts/steaks		*			*
Vacuum packaged marinated chicken		*			*
Extra lean pork					
Ground turkey		*			

* Chi-square results show that the relationship between the specific product and the demographic characteristic was significantly different at the 5 percent confidence level.

Table 31. Summary of the Relationship Between Demographic Characteristics and Specific Products (continued).

	Demographic Characteristic			
Products	Education	Occupation	Spouse Occupation	Income
Whole fresh, not frozen, turkey				
Smoked roast beef	*	*	*	
Smoked whole chickens		*		
Polish sausage				
Buffalo jerky		*		
Lean branded beef steaks				
Fish Sausage		*		
Extra lean ground beef (10% fat)				*
Low fat (pork) frankfurter (97% fat-free)				
Precooked and seasoned roast beef/steaks	*	*	*	
Farm raised (fresh) catfish filets			*	
Vacuum packaged fresh beef roasts/steaks		*	*	
Vacuum packaged marinated chicken	*	*	*	
Extra lean pork				
Ground turkey		*	*	

* Chi-square results show that the relationship between the specific product and the demographic characteristic was significantly different at the 5 percent confidence level.

CHAPTER IV

SUMMARY AND CONCLUSION

Conclusion

The overall objective of the research is to increase the small firm's ability to make better decisions concerning the product, price, promotion and distribution of meat products. The first specific objective is to describe how consumers rate the importance of: a) meat product characteristics; b) incentive factors for increasing meat consumption; c) interests in specific products; d) and their degree of knowledge about product characteristics (i.e. taste, fat level, nutritional value, economical value, convenience/ease of preparation). The following section summarizes the results achieved in accomplishing this objective.

Respondents rate taste and quality as the most important meat product characteristic. Tenderness, nutritional value, level of fat, economical value, and color are all important attributes to consumers, and are rated similar in importance. Convenience and ease of preparation, versatility, shelf-life, and packaging are less important characteristics relative to other meat product characteristics. Consumers indicated, by using the "important" end of the scale only, that all characteristics evaluated in this research are at least somewhat important.

Consumers rated the importance of a variety of incentive factors for increasing meat consumption. "Less fat" stands out with the highest mean rating of importance. Lower price, availability, and nutritional labeling have very similar ratings and are moderately important. Cooking instructions are moderately unimportant and the rating is significantly different from the ratings for other factors.

Respondents rated their level of interest in specific meat products. Consumers responded with greater interest to products which specified the words "lean" or "low-fat" in the product description. Extra lean ground beef (10% fat) has the highest mean rating for interest, and is significantly different from the group. Extra lean pork is next and is also significantly different. Low fat (pork) frankfurters (97% fat-free), and lean branded beef steaks follow with relatively high interest ratings and they are not significantly different. Respondents are also interested in Farm raised catfish, and vacuum packaged beef roasts/steaks, and these products are not significantly different from each other. Ground turkey, and whole fresh (not frozen) turkey are next and are rated significantly the same. Smoked whole chicken, ground turkey, polish sausage, and smoked roast beef are not significantly different from each other, and have somewhat lower means. Smoked roast beef is not significantly different from vacuum packaged marinated chicken. Precooked beef, buffalo jerky, and fish sausage, have the lowest ratings, and each is significantly different from all other products. Smoked products, sausages, jerky, and precooked beef do not fare well with consumers. Consumers indicate greater interest in the "healthier" products.

Respondents appear to be quite knowledgeable about product characteristics (i.e. taste, fat level, nutritional value, economical value, and convenience/eases of

preparation) based on their responses in these categories. Consumers indicate that chicken tastes the best. Beef, turkey, fish, pork, veal, and lamb followed, respectively. All meat groups were significantly different from each other in terms of taste.

Consumers rate fish and chicken as the most nutritious (not significantly different), with turkey next and not significantly different from chicken. Beef is next and it is significantly different. Veal follows and is significantly different from other meat groups. Lamb and pork are in a group of their own at the bottom and are not significantly different from each other.

Chicken considered the most economical by a margin and it is significantly different. Turkey is next, and is also significantly different. Beef and fish are in the next grouping and are not significantly different from each other. Pork is next and it is significantly different. Veal and lamb are not significantly different and are at the bottom with very low ratings relative to all other meat groups.

Fat level ratings show fish is obviously considered significantly lowest in fat. Turkey is next, followed by chicken which are both significantly different from all other meat groups. Veal is next followed by lamb (each are significantly different) and both are still considered lower in fat than beef and pork. Pork is not significantly different from beef for level of fat.

Beef and chicken are not significantly different and are considered the most convenient and easy to prepare. Turkey, fish and pork are next with very similar ratings and are not significantly different from each other. Veal is next and is

significantly different from the other groups as is lamb, which is the least convenient to respondents.

Overall, the respondents appeared to be very health conscious and were especially concerned about level of fat and leanness. Consumers reflect the trend toward white meats and away from red meats in their responses. The results shown here, concerning health, level of fat, and nutrition are similar to those reported by other researchers. Purcell found in a consumer survey for beef, p.10, that people are not confident about the level of fat in beef. Similar results were found by Yankelovich, Skelly, and White; they report that consumers are interested in leaner cuts and less fat in red meats. This project reinforces those findings, as beef is considered to be high in level of fat and is not even significantly different from pork. Chicken has the highest positive ratings in all categories. Pork is not regarded very positively in terms of the various meat product characteristics. However, when specific "lean" pork products are rated, pork receives fairly high interest ratings.

The second objective is to determine whether vacuum packaged meat product solve a problem that is important to consumers (i.e. consumer adversity to freezing meat products), and to determine whether consumers are interested in specific vacuum packaged products.

In order to determine whether there is a need for vacuum packaged products that is important to consumers, questions were asked to determine consumer attitudes about freezing of meat products and how freezing affects quality, color, and nutritional value. The results shown in Table II show that consumers have no significant adversity to freezing of meat products and they strongly disagree that

frozen meat has poor color, is less nutritious, tastes badly, or is of poor quality. A very high percentage (almost all respondents) do freeze meat after purchase. Overall, the results indicate that freezing is common practice for consumers, and consumers do not indicate negative feelings toward freezing.

Consumers were asked to rate their interest in two vacuum packaged meat products: vacuum packaged beef roasts/steaks and vacuum packaged marinated chicken. These products were rated along with thirteen other products. The results show that the beef product is rated significantly higher than the marinated chicken. Vacuum packaged fresh beef is not significantly different from farm raised catfish (fresh). The vacuum packaged chicken is not significantly different from smoked roast beef. Of fifteen total products, vacuum packaged beef roasts/steaks is rated lower, in terms of interest, than four other products. The vacuum packaged chicken is lower than ten of the products.

These results can be considered in conjunction with the results found by Pelzer, Menkhaus, Whipple, Field, and Moore in a consumer study of alternative retail beef packaging. They concluded that consumers show some adversity to the purplish color that is typical of vacuum packaged meat beef products, and it will take product education to gain consumer acceptance of the products. They stressed the importance of showing the "blooming" of the meat (the meat turns red when exposed to oxygen) to achieve wide acceptance. The article explained that the prescribed marketing strategies could be very expensive to implement. Further consumer research might be necessary to determine the feasibility and profitability of such measures.

The third objective of this research is to describe market segments based on tastes and preferences and demographic characteristics. Chi-square tests are used to determine the relationships of demographics and meat product characteristics in Question 12 and incentive factors for increasing consumption in Question 13 of the questionnaire.

The results suggest that tastes and preferences are related to gender. Women are higher-involvement consumers than men and everything seems to be important to them. The only characteristics or factors that aren't significantly different among males and females are economical value, lower price, and cooking instructions.

From the responses it can be deducted that family size is related to the importance of many product characteristics, but is not related to factors for increasing meat consumption. Single and two-person families rate most product characteristics as more important than to households with more that two members. Economical value, which might be expected to be more important to larger families, is not even significantly different across different family sizes. Even convenience and nutritional value are more important to one and two person families.

Respondents from households with children rate many factors than households without children. Families with no children indicate greater importance ratings for color, tenderness, and packaging than do families with children. It appears that smaller households are slightly more discriminating consumers and are higher-involvement consumers than larger families.

People with different levels of education tend to rate attributes and factors for increasing consumption quite differently. People with lower levels of education,

typically high school and/or trade school, indicate significantly higher importance ratings for taste, packaging, nutritional value, color, economical value, versatility, tenderness, convenience, shelf-life, quality, level of fat, lower price, availability, and less fat. People at the opposite end of the spectrum, with graduate or professional degrees rate all of these categories significantly lower than any of the other education levels. This could be and indication that lower income groups are higher-involvement consumers perhaps because they may spend a much higher percentage of their income on food.

Ethnic background makes a difference in terms of importance ratings of product attributes and incentive factors for increasing consumption of meat products. Non-whites rate packaging, color, economical value, versatility, tenderness, convenience, shelf-life, lower price, availability, and cooking instructions higher than do whites.

Tastes vary by occupation as well. Occupations are divided into four groups: white-collar, blue-collar, retired and other. Overall, white-collar respondents rate all of the significant attributes and factors as being less important. Blue-collared respondents rate packaging, economical value, tenderness, shelf-life, and lower price as being more important. Retired respondents find nutritional value, color, versatility, tenderness, convenience, shelf-life, quality, level of fat, and less fat significantly more important.

Income is found to be related to ratings of product attributes and incentive factors for increasing meat consumption. People in the lower income categories respond that packaging, nutritional value, color, economical value, versatility, convenience, shelf-life, quality, and level of fat are all significantly more important to them than to other

income groups. Convenience, shelf-life, and quality are least important to those earning over $60,000. Lower income levels (less than $40,000) appear to be higher-involvement consumers.

Higher-involvement consumers in this sample of respondents seem to be in one or more of the following demographic segments: female, one or two-person families, no children, retired, blue-collar, non-white, lower education, or lower income.

There are some categories that do not always vary in importance across demographic characteristics, but deserve attention because they were of great importance to all consumers. Level of fat, nutritional value, and less fat are important to nearly every respondent, regardless of demographic makeup.

Recommendations

This research emphasizes and argues that tastes and preferences are important and that researchers must approach consumers to find out what their tastes and preferences are. If tastes and preferences are truly important, then the analyses in this thesis need to be updated periodically. Data collected and recorded over time would be even more beneficial to researchers interested in explaining how and why consumption patterns are changing.

Because of the sensitivity of respondents to any questions that mentioned the words "lean", "extra-lean", or "low-fat"; consumers might be easily mislead by ambiguous product labeling. This lends support to arguments for stricter nutritional labeling guidelines.

There are various unsolicited responses categorized in Appendix B. Respondents have something to say to people who are willing to take an interest and listen. Overwhelmingly, consumers are concerned about fat content, salt, MSG, and nitrates. In the future, researchers might consider examining consumer preferences in terms of salt and additives even more closely. Many consumers are on salt restricted diets and as the population ages, the mature consumers will make up a larger percentage of the market. The tastes and preferences of market segments such as this one, will become increasingly important to marketers.

I. References

Alston, J.M. and J.A. Chalfant. "Can We Take The Con Out of Meat Demand Studies?" Western Journal of Agricultural Economics. 16(1991):36-48.

Alston, J.M. and J.A. Chalfant. "Unstable Models from Incorrect Forms." American Journal of Agricultural Economics. 71(1991):1171-81.

Bailey, Linda, Lawrence Duewer, Fred Gray, Roger Hoskin, Judy Putnam, and X Short. "Food Consumption." National Food Review. 11(1988):1-11.

Borra, S.T. "A Healthy Diet with Animal Product Options: What the Food Marketer and Consumer are Doing." Food Marketing Institute, Washington DC, November 1988.

Branson, R.E., H.R. Cross, J.W. Savell, G.C. Smith, and R.A. Edwards. "Marketing Implications from the National Consumer Beef Study." Western Journal of Agricultural Economics. 11(1986):82-91

Braschler, C. "The Changing Demand Structure for Pork and Beef in the 1970's: Implication for the 1980's." Southern Journal of Agricultural Economics. 15(1983):105-10.

Brown, D.J. and L.F. Schrader. "Cholesterol Information and Shell Egg Consumption." American Journal of Agricultural Economics. 72(1990):5458-55.

Brown, Mark G. and S.R. Johnson. "Equivalent Scales, Scale Economies, and Food Stamp Allotments: Estimates from the Nationwide Food Consumption Survey, 1977-78." American Journal of Agricultural Economics. 66(1984):286-293.

Capps, O.J. and J.D. Schmitz. "A Recognition of Health and Nutrition Factors in Food Demand Analysis." Western Journal of Agricultural Economics. 16(1991):21-35.

Chalfant, J.A. and J.M. Alston. "Accounting for Changes in Taste." Journal of Political Economics. 96(1988):391-410.

Chavas, J.P. "Structural Change in the Demand for Meat." American Journal of Agricultural Economics. 65(1983):148-53.

Choi, S. and K. Sosin. "Testing for Structural Changes: The Demand for Meat." American Journal of Agricultural Economics. 72(1990):228-336.

Dahlgran, R.A. "Complete Flexibility Systems and the Stationarity of U.S. Meat." American Journal of Agricultural Economics. 12(1987):152-63.

Eales, J.S. and L. Unnevehr. "Demand for Beef and Chicken: Separability and Structural Change." American Journal of Agricultural Economics. 70(1988):521-32.

Gao, X.M. and J.S. Shonkwiler. "Characterizing Taste Change In A Model Of U.S. Meat Demand: Correcting For Spurious Regression And Measurement Errors." Review of Agricultural Economics. 15-2(1993):313-324.

Gao, X.M. and J.S. Shonkwiler. "Taste Change in Meat Demand - An Application of the MIMIC Model." Southern Journal of Agricultural Economics. 23(1991):260.

Henderson, James M. and Richard E. Quant. Microeconomic Theory: A Mathematical Approach. New York, New York: McGraw Hill Company, 1980.

Moschini, G. and K.D. Meilke. "Modeling the Pattern of Structural Change in U.S. Meat Demand." American Journal of Agricultural Economics. (1989):253-61

Moschini, G. and K.D. Meilke. "Parameter Stability and the U.S. Demand for Beef." Western Journal of Agricultural Economics. 9(1984):271-82

Mowen, John C. Consumer Behavior. New York, New York: Macmillan Publishing Company.

Nyankori, J.C.O. and G. H. Miller. "Parameter Stability and the U.S. Demand for Meats." Southern Journal of Agricultural Economics. 14(1982):65-70

Pelzer, Pierre M.L., Dale J. Menkhaus, Glen D. Whipple, Ray A. Field, and Shawn W. Moore. "Factors Influencing Consumer Rankings of Alternative Retail Beef Packaging." Agribusiness. 7(1991:252-267

Phlips, Louis. Applied Consumption Analysis. New York, New York: American Elsevier Publishing company, INC. (1974)

Purcell, W.D. "The Case of Beef Demand: A Failure by the Discipline." Choices. (Second Quarter 1989):16-19

Purcell, W.D. "Consumer Survey for Beef by Socioeconomic Profile of Consumers and Related Merchandising and Promotion Strategies." Research Bulletin 4-91. Research Institute on Livestock Pricing, Agricultural Economics, Virginia Tech, Blacksburg, VA. June 1991.

Putnam, Judith Jones. "Food Consumption." National Food Review. 13(1990):1-8.

Raunikar, Robert and Chung-Liang Huang. Food Demand Analysis: Problems, Issues, and Empirical Evidence. Ames, Iowa: Iowa State University Press, 1987.

U.S. Bureau of the Census, Statistical Abstract of the United States: 1992 (112th Edition.) Washington, D.C., 1992 (U.S. Government Printing Documents Washington, D.C.)

Up Close 1990 Census Sourcebook, Volume 2 South, El Granada, CA: Up Close Publishing (1992)

Senauer, Ben, Elaine Asp, Jean Kinsey. Food Trends and the Changing Consumer. St. Paul, Minnesota: Eagan Press, 1991.

Skaggs, R.K., D.J. Menkhaus, S.J. Torok, and R.A. Field. "Test Marketing of Branded, Low Fat, Fresh Beef." Agribusiness. 3(1987):257-71

Snedecor, George W., and William G. Cochran. Statistical Methods: Sixth Edition. Ames, Iowa. The Iowa State University Press. 1967

Thurman, W.N. "The Poultry Market: Demand for Meats." American Journal of Agricultural Economics. 69(1987):30-37

Yankelovich, Skelly, and White, Inc. The Consumer Climate for Red Meat. Report to the American Meat Institute and the National Livestock and Meat Board, 1985.

APPENDIX A.

UNSOLICITED RESPONSES TO THE QUESTIONNAIRE

Health Concerns

We eat only skinless chicken.
The level of fat in beef depends on the cut.
Lower the salt levels on all processed meats, also the nitrogen and additives.
I never buy franks or bologna the label tells you it is unhealthy.
Frying is a poor way to prepare food because of fat.
Fat level in fish depends on what kind of fish.
We remove skin from chicken.
"Level of fat" and "convenience" depends on the cut of meat.
We trim all fat on all meat items.
We don't want msg.
Gluten is hidden in a lot of foods and we suffer because of that;
nutritional labeling must mention gluten(it is in marinated meats).
There's too much salt in many meat products (salt restricted diet).

Interest in New or Different Products

I would like fresh turkey pieces.
I prefer dark meat without the skin in ground turkey.
I buy buffalo when I can afford and find it.
I'm interested in whole fresh turkey at Christmas and Thanksgiving.
We prefer fat-we order untrimmed steaks and chops etc.

Meat Preservation (freezing) and Preparation

Frozen meat is of poor quality if kept too long.
I buy roast when with in my budget and freeze it for later.
I usually cook in a crock pot-seldom fry anything.
Who cares if frozen meat has unappealing color?
The quality of frozen meat depends on how long it has been frozen.
I am the male spouse and frequently prepare meat; I always eat meat with my meal.

I own farm which provides beef, pork, and chicken.

Disappointed in Meat Products or Handling

I find the dirty, smelly, meat counters and cutting rooms of the markets most unfortunate. I don't like the stores trying to sell "old" meat by repackaging it.
I can not afford to pay for expensive packaging and wrapping of meat. I feel much of the fat free labelling is misleading.

Veal and Lamb

I have never tasted or prepared lamb.
Lamb and veal are too expensive.
Who cares about lamb?
I do not use lamb and have no knowledge of it.
I boycott veal products.

Appendix B

CHI-SQUARE TABLES FOR DEMOGRAPHICS IN RELATION TO MEAT HANDLING AND SPECIFIC MEAT PRODUCTS

Table 32. Tests of the Relationships Between Consumer Attitudes about meat handling and Gender

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
I freeze meat after purchase.	3	12.995	0.005
I am very health conscious.	3	8.246	0.041
I never buy frozen meat.	5	1.781	0.879
Hard work is good for you.	3	10.848	0.013
I keep meat fresh until eaten.	5	7.487	0.187
Frozen meat is less nutritious.	4	3.080	0.545
Preparing meals consumes time.	3	7.676	0.053
Frozen meat does not taste good.	3	7.697	0.053
Frozen meat has unappealing color.	4	10.117	0.039
Frozen meat is of poor quality.	3	5.749	0.124

Table 33. Tests of the Relationships Between Consumer Attitudes About Meat Handling and Family Size.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
I freeze meat after purchase.	18	19.038	0.389
I am very health conscious.	18	30.263	0.035
I never buy frozen meat.	30	35.237	0.234
Hard work is good for you.	18	23.212	0.183
I keep meat fresh until eaten.	30	41.015	0.087
Frozen meat is less nutritious.	24	42.507	0.011
Preparing meals consumes time.	18	10.640	0.909
Frozen meat does not taste good.	18	20.823	0.288
Frozen meat has unappealing color.	24	24.057	0.458
Frozen meat is of poor quality.	18	20.925	0.283

Table 34. Tests of the Relationships Between Consumer Attitudes About Meat Handling and Presence of Children.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
I freeze meat after purchase.	12	12.099	0.438
I am very health conscious.	12	7.226	0.842
I never buy frozen meat.	20	25.324	0.189
Hard work is good for you.	12	11.765	0.465
I keep meat fresh until eaten.	20	14.991	0.777
Frozen meat is less nutritious.	16	15.452	0.492
Preparing meals consumes time.	12	12.997	0.369
Frozen meat does not taste good.	12	12.695	0.392
Frozen meat has unappealing color.	16	17.212	0.372
Frozen meat is of poor quality.	12	8.728	0.726

Table 35. Tests of the Relationships Between Consumer Attitudes About Meat Handling and Level of Education.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
I freeze meat after purchase.	12	24.027	0.020
I am very health conscious.	12	17.502	0.132
I never buy frozen meat.	20	26.808	0.141
Hard work is good for you.	12	14.325	0.280
I keep meat fresh until eaten.	20	24.681	0.214
Frozen meat is less nutritious.	16	40.318	0.001
Preparing meals consumes time.	12	13.095	0.362
Frozen meat does not taste good.	12	18.780	0.094
Frozen meat has unappealing color.	16	22.946	0.115
Frozen meat is of poor quality.	12	19.110	0.086

Table 36. Tests of the Relationships Between Consumer Attitudes About Meat Handling and Marital Status.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
I freeze meat after purchase.	9	8.859	0.450
I am very health conscious.	9	35.216	0.000
I never buy frozen meat.	15	15.896	0.389
Hard work is good for you.	9	14.834	0.096
I keep meat fresh until eaten.	15	9.195	0.867
Frozen meat is less nutritious.	12	9.384	0.670
Preparing meals consumes time.	9	10.343	0.323
Frozen meat does not taste good.	9	7.695	0.565
Frozen meat has unappealing color.	12	9.931	0.622
Frozen meat is of poor quality.	9	10.407	0.319

Table 37. Tests of the Relationships Between Consumer Attitudes About Meat Handling and Ethnic Background.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
I freeze meat after purchase.	12	9.941	0.984
I am very health conscious.	12	17.568	0.129
I never buy frozen meat.	20	28.308	0.102
Hard work is good for you.	9	8.455	0.489
I keep meat fresh until eaten.	20	15.011	0.776
Frozen meat is less nutritious.	16	13.676	0.623
Preparing meals consumes time.	12	7.673	0.810
Frozen meat does not taste good.	12	13.427	0.339
Frozen meat has unappealing color.	16	13.044	0.670
Frozen meat is of poor quality.	12	19.161	0.085

Table 38. Tests of the Relationships Between Consumer Attitudes About Meat Handling and Occupation.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
I freeze meat after purchase.	9	4.018	0.910
I am very health conscious.	9	16.428	0.058
I never buy frozen meat.	15	21.240	0.129
Hard work is good for you.	9	13.198	0.154
I keep meat fresh until eaten.	15	21.103	0.134
Frozen meat is less nutritious.	12	38.835	0.000
Preparing meals consumes time.	9	12.057	0.210
Frozen meat does not taste good.	9	10.245	0.331
Frozen meat has unappealing color.	12	16.959	0.151
Frozen meat is of poor quality.	9	13.043	0.161

Table 39. Tests of the Relationships Between Consumer Attitudes About Meat Handling and Spouse's Occupation.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
I freeze meat after purchase.	12	18.564	0.100
I am very health conscious.	12	18.545	0.100
I never buy frozen meat.	20	15.403	0.753
Hard work is good for you.	12	8.718	0.727
I keep meat fresh until eaten.	20	23.465	0.267
Frozen meat is less nutritious.	16	18.941	0.272
Preparing meals consumes time.	12	9.946	0.621
Frozen meat does not taste good.	12	15.188	0.231
Frozen meat has unappealing color.	16	15.078	0.519
Frozen meat is of poor quality.	12	12.475	0.408

Table 40. Tests of the Relationships Between Consumer Attitudes About Meat Handling and Income

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
I freeze meat after purchase.	6	16.254	0.012
I am very health conscious.	6	5.885	0.436
I never buy frozen meat.	10	10.975	0.359
Hard work is good for you.	6	10.420	0.108
I keep meat fresh until eaten.	10	16.138	0.096
Frozen meat is less nutritious.	8	14.933	0.060
Preparing meals consumes time.	6	16.957	0.009
Frozen meat does not taste good.	6	14.146	0.028
Frozen meat has unappealing color.	8	6.749	0.564
Frozen meat is of poor quality.	6	17.750	0.007

Table 41. Tests of the Relationships Between Ratings of Specific Products and Gender.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Whole fresh not frozen) turkey	3	3.368	0.338
Smoked roast beef	3	24.453	0.000
Smoked whole chickens	3	16.520	0.001
Polish sausage	3	7.562	0.056
Buffalo jerky	2	11.138	0.004
Lean branded beef steaks	5	9.181	0.102
Fish Sausage	1	3.876	0.049
Extra lean ground beef (10% fat)	3	19.834	0.000
Low fat (pork) frankfurters (97% fat-free)	3	10.668	0.014
Precooked and seasoned roast beef/steaks	3	12.865	0.005
Farm raised (fresh) catfish filets	3	4.068	0.254
Vacuum packaged fresh beef roasts/steaks	3	2.794	0.424
Vacuum packaged marinated chicken	3	3.852	0.278
Extra lean pork	3	4.074	0.254
Ground turkey	3	1.498	0.683

Table 42. Tests of the Relationships Between Ratings of Specific Products and Family Size.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Whole fresh not frozen) turkey	18	19.085	0.387
Smoked roast beef	18	26.830	0.082
Smoked whole chickens	18	24.578	0.137
Polish sausage	18	23.948	0.157
Buffalo jerky	12	12.750	0.387
Lean branded beef steaks	30	36.576	0.190
Fish Sausage	6	3.361	0.762
Extra lean ground beef (10% fat)	18	14.073	0.724
Low fat (pork) frankfurter (97% fat-free)	18	18.372	0.431
Precooked and seasoned roast beef/steaks	15	19.485	0.193
Farm raised (fresh) catfish filets	18	19.124	0.384
Vacuum packaged fresh beef roasts/steaks	18	33.546	0.014
Vacuum packaged marinated chicken	18	30.161	0.036
Extra lean pork	18	13.804	0.742
Ground turkey	18	33.200	0.016

Table 43. Tests of the Relationships Between Ratings of Specific Products and Presence of Children.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Whole fresh not frozen) turkey	12	13.362	0.343
Smoked roast beef	12	28.784	0.004
Smoked whole chickens	12	28.000	0.006
Polish sausage	12	15.501	0.215
Buffalo jerky	8	5.929	0.655
Lean branded beef steaks	20	18.416	0.560
Fish Sausage	4	4.348	0.361
Extra lean ground beef (10% fat)	12	9.228	0.683
Low fat (pork) frankfurter (97% fat-free)	12	9.999	0.616
Precooked and seasoned roast beef/steaks	12	11.991	0.446
Farm raised (fresh) catfish filets	12	16.436	0.172
Vacuum packaged fresh beef roasts/steaks	12	12.894	0.377
Vacuum packaged marinated chicken	12	17.275	0.140
Extra lean pork	12	13.316	0.346
Ground turkey	12	21.253	0.047

Table 44. Tests of the Relationships Between Ratings of Specific Products and Level of Education

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Whole fresh not frozen) turkey	12	7.266	0.840
Smoked roast beef	12	30.313	0.003
Smoked whole chickens	12	20.449	0.059
Polish sausage	12	10.860	0.541
Buffalo jerky	8	6.796	0.559
Lean branded beef steaks	20	29.965	0.070
Fish Sausage	4	4.484	0.344
Extra lean ground beef (10% fat)	12	17.301	0.139
Low fat (pork) frankfurter (97% fat-free)	12	12.305	0.421
Precooked and seasoned roast beef/steaks	9	34.667	0.000
Farm raised (fresh) catfish filets	12	11.213	0.511
Vacuum packaged fresh beef roasts/steaks	12	19.407	0.079
Vacuum packaged marinated chicken	12	23.354	0.025
Extra lean pork	12	10.955	0.533
Ground turkey	12	13.264	0.350

Table 45. Tests of the Relationships Between Ratings of Specific Products and Marital Status.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Whole fresh not frozen) turkey	9	9.567	0.387
Smoked roast beef	9	25.092	0.003
Smoked whole chickens	9	20.189	0.017
Polish sausage	9	8.534	0.481
Buffalo jerky	6	14.915	0.021
Lean branded beef steaks	15	16.211	0.368
Fish Sausage	3	4.865	0.182
Extra lean ground beef (10% fat)	9	3.218	0.955
Low fat (pork) frankfurter (97% fat-free)	9	13.394	0.146
Precooked and seasoned roast beef/steaks	9	27.762	0.001
Farm raised (fresh) catfish filets	9	4.003	0.911
Vacuum packaged fresh beef roasts/steaks	9	22.501	0.007
Vacuum packaged marinated chicken	9	33.900	0.000
Extra lean pork	9	14.110	0.118
Ground turkey	9	14.840	0.095

Table 46. Tests of the Relationships Between Ratings of Specific Products and Ethnic Background.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Whole fresh not frozen) turkey	12	10.719	0.553
Smoked roast beef	12	14.690	0.259
Smoked whole chickens	12	13.164	0.357
Polish sausage	12	15.269	0.227
Buffalo jerky	8	6.394	0.603
Lean branded beef steaks	20	18.644	0.545
Fish Sausage	4	5.536	0.237
Extra lean ground beef (10% fat)	12	16.049	0.189
Low fat (pork) frankfurter (97% fat-free)	12	14.177	0.290
Precooked and seasoned roast beef/steaks	12	13.081	0.363
Farm raised (fresh) catfish filets	12	13.631	0.325
Vacuum packaged fresh beef roasts/steaks	12	11.565	0.481
Vacuum packaged marinated chicken	12	5.694	0.931
Extra lean pork	12	13.735	0.318
Ground turkey	12	10.504	0.572

Table 47. Tests of the Relationships Between Ratings of Specific Products and Occupation.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Whole fresh not frozen) turkey	9	13.335	0.148
Smoked roast beef	9	41.515	0.000
Smoked whole chickens	9	54.975	0.000
Polish sausage	6	10.989	0.089
Buffalo jerky	6	18.606	0.005
Lean branded beef steaks	15	12.372	0.651
Fish Sausage	3	7.886	0.049
Extra lean ground beef (10% fat)	9	12.442	0.190
Low fat (pork) frankfurter (97% fat-free)	9	7.864	0.548
Precooked and seasoned roast beef/steaks	9	28.614	0.001
Farm raised (fresh) catfish filets	9	10.637	0.301
Vacuum packaged fresh beef roasts/steaks	9	26.200	0.002
Vacuum packaged marinated chicken	9	42.819	0.000
Extra lean pork	9	8.993	0.438
Ground turkey	9	22.017	0.009

Table 48. Tests of the Relationships Between Ratings of Specific Products and Spouse's Occupation.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Whole fresh not frozen) turkey	12	10.524	0.570
Smoked roast beef	12	24.094	0.020
Smoked whole chickens	12	19.804	0.071
Polish sausage	12	18.011	0.115
Buffalo jerky	8	12.512	0.130
Lean branded beef steaks	20	17.218	0.639
Fish Sausage	4	2.951	0.566
Extra lean ground beef (10% fat)	12	8.007	0.785
Low fat (pork) frankfurter (97% fat-free)	12	14.100	0.294
Precooked and seasoned roast beef/steaks	12	34.264	0.001
Farm raised (fresh) catfish filets	12	25.846	0.011
Vacuum packaged fresh beef roasts/steaks	12	29.762	0.003
Vacuum packaged marinated chicken	12	37.993	0.000
Extra lean pork	12	19.235	0.083
Ground turkey	12	30.535	0.002

Table 49. Tests of the Relationships Between Ratings of Specific Products and Income.

Attribute	Degrees of Freedom	Chi-Square Statistic	Probability Value
Whole fresh not frozen) turkey	6	11.789	0.067
Smoked roast beef	6	8.795	0.185
Smoked whole chickens	6	9.342	0.155
Polish sausage	6	9.093	0.168
Buffalo jerky	4	3.888	0.421
Lean branded beef steaks	10	15.332	0.120
Fish Sausage	2	0.758	0.685
Extra lean ground beef (10% fat)	6	15.677	0.016
Low fat (pork) frankfurter (97% fat-free)	6	10.031	0.123
Precooked and seasoned roast beef/steaks	6	5.552	0.475
Farm raised (fresh) catfish filets	6	9.090	0.169
Vacuum packaged fresh beef roasts/steaks	6	7.860	0.249
Vacuum packaged marinated chicken	6	8.181	0.225
Extra lean pork	6	9.761	0.135
Ground turkey	6	5.477	0.484

VITA

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