

IMPACT OF A SATELLITE VIDEOCONFERENCE ON  
VIEWER KNOWLEDGE, ATTITUDE AND  
BEHAVIOR TOWARD BEEF

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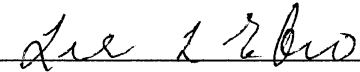
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## CHAPTER I

### INTRODUCTION

Total United States consumption of meat, poultry and fish has increased 33 percent since 1950, from an average of 162 pounds per capita to 216 pounds in 1982, however, most of this growth occurred before 1970 after which consumption began to level off. While there has been little change in total consumption since that time, meat choices have changed. Per capita beef consumption fell from 86.4 pounds per year during 1970-72 to 78.6 in 1980-82. It is estimated to be 77.3 pounds in 1985 and was expected to drop to 72-73 pounds in 1986 and below 70 pounds by 1990. Pork consumption fell from 64.5 pounds per person per year to 61.4 pounds between 1972 and 1982 and was surpassed by poultry consumption which had risen during this period from about 50 pounds per capita to 63 pounds. Poultry consumption is predicted to surpass that of beef by 1987. Fish consumption rose from 11.8 to 12.3 pounds per capita.

For the American meat industry these changes impact directly. Supermarket meat department sales fell from 20.2 to 18 percent of total store sales between 1981 and 1984. There has also been a decrease in the total space in supermarkets devoted to meat. There are a variety of

reasons cited by industry spokespersons as reasons for the change in meat demand. These include:

- \* An increase in the number of one and two person households which by 1990 may make up two-thirds of all households. Smaller family units find it difficult to use large meat cuts such as roasts.

- \* An increase in the average age of the U.S. population. As people age, their caloric requirements drop, thus even if meat is eaten with the same regularity, portions are smaller. Those over 65 may have decreased consumption due to lack of appetite, ill health, special diet restrictions, lack of interest in or facilities for food preparation, lack of mobility, low income, or other reasons.

- \* An increase in households headed by single mothers. The number of these families rose 58 percent between 1970 and 1980. Female-headed households are apt to be less affluent with incomes of only 57-58 percent of those headed by males and this may be another factor which limits the frequency, quantity, and cut of meat served.

- \* An increase in the number of working women. By 1983, 53 percent of women over 16 were working or looking for work. Fifty-seven percent of women with children worked outside the home. These families are apt to eat away from home more frequently. For all families one of every five meals is eaten away from home and meals away from home account for one third of their food dollars.

Households with working women also rely on convenience foods to reduce the time spent in food preparation. A survey of all types of families done for the American Meat Institute (AMI) by the research firm Yankelovich, Skelly, and White, Inc. (1985) found speed and ease of preparation the most important considerations in food purchases. This was true for 25 percent of those surveyed in 1985 compared to 20 percent in 1983. One third indicated they rarely had time to spend more than 30 minutes in meal preparation. Those who indicated a joy of cooking also declined from 37 to 32 percent.

\* Increased weight control, health and fitness consciousness. Many consumers perceive red meat to be high in fat and cholesterol. The AMI survey found the percentage of those who said it is important to limit fat intake even without weight control considerations, rose from 57 to 68 percent between 1983 and 1985. Thirty-eight percent said weight control is a big influence in their food purchases compared to 35 percent in 1983. Nearly twenty-five percent said they were considering or had already reduced meat consumption for health reasons compared to 20 percent in 1983 (Yankelovich, Skelly, and White, 1985).

The Yankelovich, Skelly, and White, Inc. (1985) research firm identified some strategies and communications guidelines which the meat industry should consider to improve their situation. These included:

- \* Reinforcement of the assets and values consumers associate with meat but with less emphasis on its fat content or other negative perceptions such as antibiotic residues, cholesterol content, and additives present in processed meat products.

- \* Concentration on opportunities that may be possible due to new products, product improvements, labeling and brand identification.

- \* Continued targeting of efforts toward new active lifestyle and health-oriented segments while their meat consumption behavior is still strong. This group now comprises 50 percent of the population.

#### Problem Statement

The decrease in red meat consumption per capita since 1970 is a result of several factors which include concern for weight control and health, time constraints of working and active families, cost, concern about the fat and cholesterol content of red meats, smaller family size, the aging U.S. population, the increased availability of other protein choices such as chicken and fish and the perceived nutritional benefits of these alternatives. Not all the information used by the consumer to evaluate red meat is accurate due to misleading sources, incorrect interpretation, and changes as a result of continuing research. As a result some consumers have decreased their consumption or may feel a need to do so.

## Purpose and Objectives

This study examined the change in participants' knowledge, attitudes, and behavior toward beef after they had viewed the satellite videoconference titled "Eating Healthy--A Guide for Active Living" which addressed beef nutritional and consumer issues associated with beef consumption.

The program addressed the issues of the nutritional contributions of beef to the diet, its role in a weight loss or weight control regimen, the relationship to heart disease, current consumption trends, and information on the incorporation of beef into a healthy diet.

Specifically the objectives of this study were to determine the impact on viewer knowledge, attitudes, and behavior of a satellite videoconference on beef.

1. To determine if consumers knowledge of and attitude toward beef was affected by the information presented in the videoconference.
2. To investigate consumer behavior by determining the frequency of beef consumption before and after viewing the videoconference.
3. To determine if consumer beef purchasing was affected by information presented on the program.
4. To determine the impact of the videoconference on preparation methods used for beef.

## Hypotheses

The following hypotheses were formulated for this study.

Hypothesis 1: There will be no difference in knowledge, attitude or behavior regarding beef associated with the selected demographic variables of education, male or female head of household employment status, household income or type of community in which the subject resides.

Hypothesis 2: There will be no significant change in knowledge of beef in those attending the videoconference.

Hypothesis 3: There will be no significant change in attitude toward beef resulting from information presented on the program.

Hypothesis 4: Beef purchasing and/or use practices will not significantly change after viewing the program.

## Assumptions

The following assumptions were recognized in this study:

1. The information obtained by the questionnaires was honest and correct.
2. Beef is a part of the diet of most respondents.

## Limitations

The following limitations were recognized:

1. The population group was not randomly selected.

2. The use of the pretest during the beef videoconference may have alerted respondents to certain points in the program and served as a stimulus to increased awareness of those ideas.

#### Definitions

The following definitions were used in this study:

Designated downlink site: Location where videoconferences were viewed under the sponsorship of a County Extension Service and where pretests were administered.

Eating Healthy--A Guide to Active Living: A videoconference addressing the role of beef in the diet.

Meat: Included the red meats beef, veal, lamb and pork. Did not include poultry or fish.

Videoconference: An educational lesson conducted at different sites using a televised program from a central location.



## CHAPTER II

### REVIEW OF LITERATURE

A variety of factors impact on beef consumption in the United States including socio-demographic changes such as decreased household size, changing household makeup, the increasing average age of the population, family income, an increased interest in nutrition and health especially regarding the dietary role of beef in coronary heart disease, overweight and obesity, and convenience in buying and preparing meals. Beef consumption is closely linked to the consumers' attitudes and life-styles and their nutrition knowledge and concerns.

#### Socio-Demographic Trends Affecting

#### Red Meat Consumption

Socio-demographic trends among consumers for red meats, and other foods, affect consumption patterns slowly. It is possible to examine the consumption patterns of various population groups, to observe how individual foods or food groups increase or decrease in importance, and to draw general conclusions on whether these forces will have positive or negative implications for meat consumption (Myers, 1985).

Household makeup between 1970 and 1980 changed as one-person households increased 78 percent, from 17 percent to nearly 23 percent of all households (U.S. Dept. of Commerce, 1983). In 1981, these households spent 26.8 percent more per capita for total food and 11.6 percent more for food at home than the 1981 average for all families (Myers, 1985); however, they spent six percent less for beef and 3.4 percent less for pork than the average. Expenditures for poultry were 10 percent above the average, fish 11.6 percent more, cheese 28.5 percent more and fruit and vegetable expenditures were 32 percent higher than average. As a result the increasing number of single-member households will have a positive impact on poultry, fish, cheese, fruits and vegetables but a slightly negative impact on red meat consumption.

Single-female-parent families with children under 18 years of age also increased in number, rising from 4.5 percent of households in 1970 to 6.7 percent in 1980. These families spent 26 percent less per capita for total food and 18 percent less than the average household. They tended to have lower incomes which affected food choices in the form of higher expenditures for cereals, processed meats and fresh whole chickens (Myers, 1985).

Another demographic change in the United States has been the increased average age of the population. In 1982, 11.6 percent of the population was 65 years or older. Estimates indicated the older population would rise to 13

percent by 1990. This group generally tends to spend more on cereal and bakery products, pork, poultry, fish, eggs, and fruits and vegetables but less for dairy products, processed meats and beef (Myers, 1985).

Family income and economic conditions also affected food patterns. In 1981, households with incomes below \$5000 spent 11 to 15 percent less than average for all households for beef and pork. On the other side, those with incomes over \$30,000 spent 29 percent above average for beef and 18 percent above the average for all households for pork. Economic conditions such as interest rates, energy costs, and inflation affected the amount of money available for food expenditures (Myers, 1985).

There has been a shift to increased support for diet and health factors including fitness, weight control, and overall wellness. According to research conducted by Yankelovich, Skelly, and White for the National Live Stock and Meat Board (1985), as many as two thirds of all consumers are health conscious. Ninety percent indicated they try to limit fat intake. In the 1980's consumers were more practical and prudent in their approach to nutrition and health than in the 1960's being more apt to accept a long term concept, establishing healthful eating habits as routine. Negative publicity about meat in relation to health and nutrition issues had placed meat in a less favorable position than other animal foods such as chicken or fish. This may have been the reason for a decline in

the consumer pro meat segments which fell from 67 percent of consumers surveyed by Yankelovich, Skelly and White in 1983, to 50 percent in 1985. The consumer perception of nutritious is a combination of positive attributes of a food, such as providing of certain nutrients, and the absence of negatively viewed attributes such as fats, sugars, cholesterol and additives (McNutt, 1985).

Increased numbers of working women and single-member households plus a changed attitude toward convenience foods had increased acceptance and desire for convenience in food preparation. The number of primary food shoppers who rarely spent more than thirty minutes to one hour to prepare meals rose from 23 to 36 percent between 1983 and 1985 (Yankelovich, Skelly, and White, 1985). The speed or ease of preparation as the most important factor in food purchasing decisions rose from 20 to 25 percent in that same time period.

## Nutrition and Health Issues

### Coronary Heart Disease

Red meats have been linked by consumers to modern-day diseases prevalent among the population such as coronary heart disease and to obesity. While the involvement of the cholesterol and fat content of meat in the diet remains under study regarding their role and impact in health issues, the perception of the consumer that meat is a less healthy nutrition choice and has contributed to a decrease

in per capita consumption (Yankelovich, Skelly and White, 1985).

Fat/Saturated Fat. Since 1909 the proportion of calories provided by fat in the American diet has risen from 32 to 43 percent. The latest National Food Consumption Survey (USDA, 1986) found this had decreased from 41 to 36 percent for men 19 to 50 years of age. The survey reported that women between 19 and 50 years of age also consumed an average of 36 percent of their calories from fat in 1985-86 (Peterkin and Sims, 1987). Since 1909 the use of vegetable oils rose from 1.5 to 23.3 pounds per capita per year. In 1977 the Senate Select Committee on Nutrition and Human Needs recommended the diet should be constructed so that 12 percent of the calories were from protein, 30 percent from fat and 58 percent from carbohydrates. The committee also warned that a diet containing excessive saturated fat could increase risk of cancer, coronary heart disease and high blood pressure. The 1985 edition of the Dietary Guidelines for Americans published by the United States Department of Agriculture and the Department of Health and Human Services (USDA, 1985) recommended an avoidance of "too much fat, saturated fat, and cholesterol." Suggestions for achieving this goal which involved beef included 1) choose lean meat, fish poultry, and dry beans and peas as protein sources, 2) trim fat off meats, 3) broil, bake or broil rather than fry, and

4) read labels carefully to determine both amount and type of fat present in foods.

Table 1 summarizes the dietary recommendations of several organizations (Behlen and Cronin, 1985). Most recommended a reduction or moderation of total fat intake. Specific levels of fat as a percent of total calories were recommended by the Dietary Guidelines for Americans, the American Heart Association, and the Diet, Nutrition, and Cancer report.

Red meats contribute to dietary fat but an average daily consumption of four ounces per day supplies only 10.7 percent of the calories from fat in a 2000 calorie per day diet, assuming 50 percent of the fat on the meat is eaten (Breidenstein, 1984). Of the total lipid content (8.73 grams) of 100 grams of lean, broiled beef loin approximately 39 percent is saturated fatty acids (3.57 grams), 44 percent monounsaturated fatty acids (3.85 grams), and 4 percent polyunsaturated fatty acids (0.37 grams). Of the total lipid content (19.26 grams) of 100 grams of pan fried, regular ground beef (73 percent lean) approximately 40 percent is saturated fatty acids (7.56 grams), 44 percent monounsaturated fatty acids (8.43 grams), and 4 percent polyunsaturated fatty acids (0.72 grams) (Breidenstein, 1984).

Fats in the diet are often described as "visible" or "invisible". Visible fats include those which are easily detectable by the eye including the trimmable fat on meat.

TABLE 1

SUMMARY OF DIETARY RECOMMENDATIONS MADE FOR  
HEALTHY AMERICANS BY 10 FEDERAL,  
PROFESSIONAL, AND HEALTH  
ORGANIZATIONS (BEHLEN  
AND CRONIN, 1985)

Title and organization	Nutrient adequacy	Weight control	Fat			Cholesterol
			Total	Saturated	Polyunsaturated	
<u>Dietary Goals for the United States.</u> 2nd edition U.S. Senate Select Committee on Nutrition and Human Needs, 1977	*	To avoid over- weight, consume only as much energy as expended.	Reduce to 27-33 percent of total energy.	Reduce to 8-12 percent of total energy.	Intake should be 8-12 percent of total energy intake.	Reduce to 250- 350 mg/day.
<u>Diet and Coronary Heart Disease:</u> <u>General Dietary Recommendations</u> American Heart Association, 1978	*	Balance calories to maintain ideal weight.	Reduce to 30-35 percent of total calories.	Reduce to less than 10 percent of total energy.	Up to 10 percent of total calories.	Reduce to 300 mg/day for adults.
<u>Healthy People--Surgeon General's</u> <u>Report on Health Promotion and</u> <u>Disease Prevention</u> U.S. Department of Health, Education, and Welfare, 1979	Balance and vary food choices everyday.	Exercise and balance calories to maintain desirable weight.	Reduce excess intake.	Consume less.	*	Consume less.
<u>Concepts of Nutrition and Health</u> <u>Council on Scientific Affairs</u> American Medical Association, 1979	Vary diet to increase nutri- ent adequacy.	Maintain desirable weight through dietary control and exercise.	Moderate intake regardless of source.	Proportion of saturated and polyun- saturated fat is not of universal importance.		Level in the diet is not of universal importance.
<u>Recommended Dietary Allowances</u> <u>Committee on Dietary Allowances</u> Food and Nutrition Board National Research Council National Academy of Sciences, 1980	Nutrient recom- mendations are to be met by a variety of foods.	Balance energy intake with out- put to maintain desirable weight.	Reduce to not more than 35 percent of dietary energy, particularly in diets below 2000 calories.	Reduce.	Upper limit intake of 10 percent of dietary energy.	*
<u>Nutrition and Your Health:</u> <u>Dietary Guidelines for Americans</u> U.S. Department of Agriculture and Department of Health and Human Services, 1980	Eat a variety of foods.	Maintain ideal weight. If obese, lose weight grad- ually; increase physical activity.	Avoid too much.	Avoid too much.	*	Avoid too much.
<u>Toward Healthful Diets</u> Food and Nutrition Board National Research Council National Academy of Sciences, 1980	Select wide variety of foods from the major food groups.	Adjust energy in- take to maintain appropriate weight for height.	Reduce intake if overweight, or if energy needs are low.	Recommendations not warranted for the public.	Recommendations not warranted for the public.	Recommendation not warranted for the healthy person.

TABLE 1 (Continued)

<u>Diet, Nutrition, and Cancer</u> Committee on Diet, Nutrition, and Cancer National Research Council National Academy of Sciences, 1982	*	*	Reduce intake to 30 percent of total caloric intake.	Reduce intake.	Reduce intake.	*
<u>Nutrition and Cancer: Cause and Prevention--A Special Report</u> American Cancer Society, 1984	*	Avoid obesity.	Cut down intake.	*	*	*
<u>Cancer Prevention</u> National Cancer Institute National Institutes of Health U.S. Department of Health and Human Services, 1984	Vary diet. Eat variety of foods every day.	Prevent being overweight; increase physical activity.	Keep intake of all fats low-- both saturated and unsaturated.	Keep intake of all fats low-- both saturated and unsaturated.	Keep intake of all fats low-- both saturated and unsaturated.	*

\*No specific dietary advice is stated in the published report. If a group specifically stated that recommendations are inappropriate or unwarranted, this is noted.



These account for about 40 percent of the fat in the American diet. Invisible fats are those which cannot be distinguished as a separate part of the food such as the marbling of meat, fat added during processing of meat items such as ground beef or sausage, or fat used in cookery methods such as pan or deep-fat frying. Some invisible fat in beef is located in the marbling where a lean, trimmed piece of meat can contain four to 12 percent fat (Institute of Food Technologists' Expert Panel on Food Safety and Nutrition, 1986). More invisible fat is located in processed beef products. The National Health and Nutrition Examination Survey (NHANES) II data, collected between 1976 and 1980, identified hamburger as the largest single contributor of fat in the American diet, hot dogs and luncheon meats were second, while beef steaks and roasts were fifth (Rathje and Ho, 1987).

Consumers have responded to environmental influences to reduce the fat content of their diets by reducing purchases of red meat with visible fat (steaks, roasts, and chops) and increasing the amount of that fat which they discarded. But they appear to have had difficulty identifying invisible fats in meat. During the period of 1979 to 1983, the purchase of red meat with invisible fat increased or held constant (Rathje and Ho, 1987). Rathje and Ho suggest convenience as one reason for the increased purchase of meats high in invisible fat. Meats such as lunch meats, hot dogs and ground beef are easy and quick to

prepare. The increase may also have been a result of a lack of education. Some processed meat products fall under regulations for Standards of Identity which specify the minimum and maximum amount of ingredients, including fat, which a product must contain. Standards of Identity have been established by the USDA for ground beef/hamburger, breakfast sausage, and frankfurters which must contain no more than 30, 35, and 30 percent fat respectively (Institute of Food Technologists' Expert Panel of Food Safety and Nutrition, 1986). Foods which fall under Standard of Identity regulations are not required to provide either ingredient or nutrition labeling which might alert consumers to the high fat content of these products. Other undefined label terms such as "lean," "extra lean," and "light" may mislead consumers. In 1987 the USDA established guidelines to define the allowable fat content of meat labeled with these terms. "Extra lean" beef must contain less than five percent fat in the raw flesh, "lean" beef less than ten percent, and beef labeled "leaner," "light," "lite" or "lower fat" must contain at least 25 percent less than most comparable products (Glavin, 1986).

A comparison of the fat in women's diets in 1985 and 1986 to that of 1977 found women reported they consumed considerably more skim and lowfat milk (60 percent more), soft drinks (53 percent more), and grain products (29 percent more) and less whole milk (down 35 percent), eggs (down 28 percent), cooked red meat and processed meats

(down 34 percent) (Peterkin and Sims, 1987). USDA's Continuing Survey of Food Intakes by Individuals indicated women from the higher-income households were leaders in these changes which were apparently made to reduce the caloric, fat and/or cholesterol content of their diets. However, even though the higher-income ate much less meat and whole milk, the mean fat level of their diets was higher than for women in two lower income groups, both in grams of fat (74, 68, and 65 g per day, respectively) and as a percentage of energy (38, 36, and 36 percent). The lower contribution of fat by the meat poultry, and fish group, and the egg group in high-income women's diets was more than compensated for by greater contributions by fats and oils, particularly salad dressings, by cheeses and cream desserts and by baked goods other than bread (Peterkin and Sims, 1987).

In response to consumer desire for leaner meat, beef marketed in the 1980's is leaner than that of the 1950's. Early in the 1900's the practice of feeding grain to cattle was found to improve eating qualities of beef, especially tenderness, through the reduction in the age of the animal being slaughtered. This was a result of a faster weight gain on grain rations as opposed to a diet of grass and other forages. In 1927 the United States Department of Agriculture adopted beef grading standards that gave preference to highly marbled, younger beef. Thus beef producers tended to market cattle with heavier fat

deposits. In 1965 it was recognized that marbling was independent of other fat deposits and quality evaluation was separated from evaluation of lean yield with the establishment of USDA yield grades. Cattlemen began producing leaner cattle and edible portion as a percent of carcass weight increased by slightly over 6 percent between 1950 and 1980 with fed cattle producing approximately 75 pounds more edible meat per head, an increase of 27 percent (National Live Stock and Meat Board, 1983). Kauffman and Breidenstein (1983), estimated that beef carcass fatness had been reduced by about six percent between 1950 and 1985.

Cholesterol. Cholesterol is an essential body component, necessary for strong cell membranes, protection of nerve fibers, and the production of bile acids, vitamin D, and some hormones. It is produced by the body in amounts regulated in part by the amount provided through foods. Between 600 to 3,000 mg are synthesized by the body and/or consumed from food each day (Council for Agricultural Science and Technology, 1985). The average American diet provides over 450 mg per day (Council for Agricultural Science and Technology, 1987). Body production does decrease as consumption increases but in general the more cholesterol eaten, the higher the level in the blood. The primary sources of dietary cholesterol are foods of animal origin. Eggs are one of the major sources of cholesterol in commonly eaten foods with an average egg

yolk containing 250 mg. Red meats, poultry, and fish provide lesser amounts with a three ounce serving contributing between 50 to 80 mg.

Concern about dietary cholesterol is based on the fact that blood cholesterol is one of the risk factors associated with atherosclerosis. Dietary intake of cholesterol cannot be directly related to blood cholesterol levels, but it may be a contributing factor along with total dietary fat, saturated fat, lack of dietary fiber, heredity, hypertension, cigarette smoking and obesity (Institute of Food Technologists' Expert Panel of Food Safety and Nutrition, 1986). For people who consume the usual amount of dietary cholesterol (450 mg/day) small changes in intake result in a compensatory response by the body to maintain blood cholesterol and no significant changes in plasma levels are seen. To reduce serum cholesterol level significantly by reducing dietary cholesterol the person would need to reduce dietary intake to less than 100 mg per day. This would require a near elimination of animal foods from the diet (Council for Agriculture and Science Technology, 1987).

The level of cholesterol circulating in the blood is influenced more by total fat and type of fat consumed than dietary cholesterol intake. Dietary fats containing saturated fatty acids comprised of carbon chains between 6 to 14 in length appear to cause more hypercholesterolemia than saturated fatty acids comprised of carbon chains of 16

to 20 carbons in length (Council for Agriculture and Science Technology, 1987).

### Overweight and Obesity

The consumer believes it is not good to be overweight. Interest in weight reduction has resulted in innumerable books, articles, programs, businesses, "experts", and products which sometimes are detrimental to health or household finances. It has been estimated that ten to 15 percent of the population of the United States is on a weight-restriction program at any one time with 57 percent trying to reduce calories, 37 percent to reduce sugar, 37 percent to reduce salt, and 21 percent to reduce cholesterol (Hansen, et. al., 1985).

Meat is nutrient dense and can be a good choice for weight conscious consumers. A three ounce serving of lean beef contains 192 calories and is a good source of protein, iron, zinc, and B-vitamins. Serving size is critical when considering calorie and fat content (Hammock, 1985). Consumers who choose smaller, leaner portions, trim fat before cooking, and trim again or drain the fat from meat before eating can further reduce the calorie content. Using preparation methods which add little or no fat during cooking such as braising, baking, roasting, and broiling also limit the calorie content (McNutt, 1985, and Leveille, 1985). Another contribution of meat to a low calorie meal is satiety value. The fat provided by meat slows digestion

and delays the return of hunger (National Live Stock and Meat Board, March, Special Issue, 1983).

### Key Nutrients

Meat is an excellent source of complete protein and other nutrients (Table 2). Protein is also available from non-meat foods but as currently consumed, red meat supplies about 59 percent of the U.S. Recommended Daily Allowance (USRDA) for protein (Williams, 1987). Some of the nutrients in table 2 are not easily acquired elsewhere. Beef contributes 13.9 percent of the USRDA for iron and 31.4 percent of the zinc. The significance of the quantities of these two minerals is increased because of the bioavailability of the form in which they are found in red meats. Between 30 to 60 percent of the iron in red meats is heme iron (Cook and Monsen, 1976) which is two to seven times more bioavailable than nonheme iron (Monsen, et.al., 1978). From 15 to 30 percent of the iron in meat is absorbed compared to five percent from vegetable sources (Brody, 1981). Red meats also supply the "Meat Factor" which reportedly increases the bioavailability of iron from all dietary sources. Fruit and vegetable sources also contain fiber and some contain phytic and oxalic acids which inhibit iron absorption (Hammock, 1985). Red meats contain a high B-vitamin content and availability providing 21 percent of the USRDA for thiamin, about 12 percent for

riboflavin, 25 percent for niacin and about 37 percent for vitamin B-12 (Williams, 1987).

TABLE 2  
NUTRIENT CONTRIBUTION OF TOTAL COOKED RED  
MEAT INGESTION BY USE LEVEL IN THE  
U.S. DIET, 1984 (WILLIAMS, 1987)

Nutrient	Light Users	Moderate Users	Heavy Users	Average Users	Total Users %USRDA
Total meat,g	41.14	117.00	216.31	118.89	
Total meat,oz	1.45	4.13	7.63	4.19	
Protein,g	9.47	26.33	47.57	26.44	58.8
Lipid,g	8.48	24.46	45.55	24.95	--
Energy,kcal	117.5	334.9	618.1	340.1	--
Cholesterol,mg	33.4	92.2	167.8	93.2	--
Iron,mg	.91	2.49	4.44	2.5	13.9
Zinc,mg	1.77	4.75	8.27	4.71	31.4
Sodium,mg	160.9	526.4	1086.4	568.4	--
Thiamin,mg	.091	.302	.605	.317	21.1
Riboflavin,mg	.063	.189	.372	.198	11.7
Niacin,mg	1.751	4.911	9.062	4.998	36.7

The USDA's Continuing Survey of Food Intakes by Individuals reported that when intakes during 1985-86 and 1977 were compared, women of all incomes consumed less red meat. It was also reported intakes for iron, zinc, folacin, calcium, vitamin B6 and magnesium fell below Recommended Dietary Allowances. It appeared that dietary changes made to reduce the caloric, fat and/or cholesterol content of the diet had an adverse impact on these



nutrients. Consumers need to choose foods for their vitamin and mineral content as well as the avoidance of fat (Peterkin and Sims, 1987).

## Consumer Market Research

### Attitudes and Perceptions

Beef is considered to be a very significant purchase, as evidenced by its expense and consumer willingness to go "out of their way" for "quality" beef (some regularly, some only for holiday/guest occasions) or to shop at a different store than usual when it offers sale prices for beef (Research Alliance, 1983).

When a Good Housekeeping survey asked consumers if either beef, chicken or fish was more nutritious than another, 42 percent said they were equal. There was little difference between the percentages of respondents who considered beef (10 percent) or chicken (11 percent) most nutritious, but fish (36 percent) did outrank both beef and chicken for those who did perceive a difference among the three (McNutt, 1985).

A Wheat Industry Council survey (1983) included a segment on consumer attitudes toward frequently consumed food products such as whole milk, fresh fruits, eggs, chicken, baked potatoes, pizza and ground beef. Results indicated respondents found ground beef was fattening (17 percent), filling (51 percent), high in fat (46 percent), high in cholesterol (27 percent), part of a well balanced

diet (67 percent), nutritious (65 percent), good for growing children (59 percent), wholesome (43 percent), a good source of vitamins and minerals (37 percent), a good source of protein (73 percent), a good food value for the money spent (55 percent), good tasting (72 percent), liked especially by adults (59 percent), and liked especially by children (56 percent).

Ketchum Research (1985) reported attitudes towards beef were declining overall in the areas of health/nutrition and lifestyle. This decline was primarily attributed to declines among light users. The attributes that experienced significant decreases between the previous surveys were that "beef is good tasting" which dropped from 80 percent of respondents in 1982 to 75 percent in 1985; "beef is good for active life-styles" which dropped from 60 percent of respondents in 1984 to 54 percent in 1985; and "beef is a good source of nutrients, proteins, and vitamins" which decreased from 71 percent in 1984 to 64 percent in 1985. Beef's ratings on nutritional statements had generally declined although it still rated relatively high on general health statements such as "beef is high in nutrition" and "beef is a good source of nutrients, protein and vitamins" versus specific health statements including "beef is low in cholesterol or fat" where it rated low.

These same researchers (Ketchum Research, 1985) found attitudes toward beef were very positively related to the frequency of consumption. Heavy users of beef had

significantly better attitudes than light users on virtually every dimension. Attitudes in general were declining to a greater degree among the light users than the medium/heavy users.

#### Frequency of Use

Yankelovich, Skelly and White, Inc. (1983) found from a 14 day survey of consumer attitudes toward meat that meat consumption is closely linked to consumers' attitudes and lifestyles. Meat consumption levels were classified as: heavy users; moderate users; light users; and occasional/nonusers.

Heavy meat users were families that served meat about 13 times per week. These consumers had larger families and were representative of "Middle America." They had a more traditional lifestyle and attitude toward food. Taste governed most of their food purchases but they were also influenced by health concerns, convenience, and price (Breidenstein, 1984). Total average meat consumption of heavy users (Table 3) was 8.739 ounces per capita per day (Williams, 1987).

Moderate/light meat users accounted for 65 percent of the respondents and consisted of moderate and light users combined for fresh meat, separated for processed meat. Moderate/light users served fresh meat one and one-half to four times per week. Moderate users served processed meats three to seven times per week compared to light users who

served processed meats only one-half to two and a half times. Light users came from older, smaller families. They were more likely to reduce their consumption of meat for health reasons and showed a high level of concern for fat, salt, cholesterol, and weight control (Breidenstein, 1984). Average total daily meat consumption of moderate/light meat users (Table 3) was 2.758 ounces per capita (Williams, 1987).

Occasional/nonusers accounted for only three percent of U.S. households. The average consumption of ground beef and other fresh beef and pork for this group was 0.299 ounces per capita per day. Total daily per capita meat consumption was not reported because the 1983 Yankelovich, Skelly and White survey did not include these user categories (Breidenstein, 1984).

TABLE 3

OVERALL USE LEVELS OF RED MEAT IN THE U.S.  
DIET BY TYPE OF RED MEAT (WILLIAMS, 1987)

	Heavy Users	Moderate Users	Light Users	Total Users
	Ounces per capita per day			
Fresh Beef	2.38	1.49	.57	1.41
Ground Beef	1.06	.62	.28	.62
Fresh Pork	.78	.39	.10	.39
Fresh lamb	.04	.02	.01	.02
Fresh veal	.09	.04	.02	.05
Processed meat	3.28	1.56	.47	1.71
All red meat	7.66	4.14	1.45	4.20

In 1983 Yankelovich, Skelly and White, Inc., repeated a study of red meat usage done in 1981. The update provided trend readings from the previous research and more specific data on beef than the original study which grouped all red meats. The researchers found the reduction in meat consumption noted in 1981 appeared to be leveling off. They reported the market climate appeared to be a more favorable one for the meat industry to get its message across to more rational, pragmatic consumers perhaps due to an improved economic climate. Five consumer segments were determined: meat lovers (22 percent); creative cooks (20 percent); price driven (25 percent); active lifestyle (16 percent) and health oriented (17 percent). Meat lovers felt quite strongly that a main meal must include meat and that its taste ranked it above the other entree choices. Creative cooks were also frequent meat users but spent more time on meat preparation and experimented with a wide variety of recipes and foods. The price driven consumers were also pro meat but they let price determine the type of meat (or meat alternative) they bought. Purchase decisions by the active lifestyle group were determined by speed and ease of preparation. They did not enjoy spending time in the kitchen and ate away from home quite often. They also expressed a fairly high level of concern about health issues. Health oriented consumers were the most concerned about all health related issues and used meat less

frequently because it was perceived to be a less healthful food.

### Preparation and Eating Habits

Although beef users were aware of information discouraging beef use and sometimes found beef to be prohibitively expensive, users enjoyed it and were open to new serving ideas that presented beef in a fashion that tied in with contemporary attitudes toward diet and meal preparation and to budget constraints. Beef buyers felt they were in a rut with regard to beef usage but lacked the personal knowledge of things such as grading or unfamiliar cuts to make changes. Some resolved this problem by shopping at more expensive stores where an attending butcher provided assistance. Most others did little to seek new or different ways of using beef because of the lack of good information, a limited schedule, and/or societal cues that beef usage may be questionable (Research Alliance, 1983).

### Nutrition Knowledge and Concerns

Nutrition is one of the key issues for consumers in buying food at the supermarket. The 1984 Food Marketing Institute update on supermarket trends found consumer concern about the nutritional content of the food they buy to be very high (95 percent). The survey listed 20 nutritional factors and asked consumers to indicate those

of which they were concerned. Frequently mentioned were vitamin/mineral content (25 percent) and sugar (22 percent). Consumers were also concerned about calorie content (nine percent) and cholesterol content (eight percent) (National Live Stock and Meat Board, 1984).

A relatively low proportion (25 percent) of consumers claimed to have serious health/nutritional concerns about beef. Of those expressing health/nutritional concerns about beef, about 60 percent were extremely or very concerned. Cholesterol and fat were the two primary areas of concern. Those expressing concerns about beef skewed toward being middle aged, well educated, upper incomes and light users of beef. A significant proportion of those people claimed to be reducing their consumption of beef (Ketchum Research, 1985).

A survey done for Woman's Day magazine reported primary sources of nutrition information in 1978 (Yankelovich, Skelly and White, Inc., 1978) were magazine and newspaper articles (44 percent), doctors/clinics (29 percent), labels on products (28 percent), medical experts on television (18 percent), cookbooks (17 percent), magazine and newspaper advertisements (15 percent), the government and school economists (12 percent each). A follow-up survey for Woman's Day Magazine two years later (Marcacom Research Corporation and the Nutrition and Marketing Research Departments of General Mills, 1980) reported consumers were more likely to mention use of

magazine and newspapers advertisements, doctors/clinics and dentists, and less likely to name magazine and newspaper articles, labels and diet plans. Among specific population groups it appeared that the higher the economic status, the more dependent the consumer was on magazines, newspaper articles and books for nutrition information. Consumers who were less well informed about nutrition had greater reliance on television commercials.



## CHAPTER III

### METHODOLOGY

The study involved a videoconference, "Eating Healthy--A Guide to Active Living" which consisted of a two hour program of live studio discussion, taped segments, and a viewer question/answer call-in period. Issues relating to beef consumption and health, such dietary fat and cholesterol, preparation methods, changes in beef production and processing to provide leaner meat, new beef products and packaging, and increased availability of nutrition information at the point of purchase, were explored. The target audience was the active lifestyle, health oriented person who still has a strong meat behavior orientation. This chapter includes the research design, sample, data collection, instrumentation, survey procedures, and data analysis used in this study.

#### Research Design

Descriptive status survey was used in this study. "Descriptive research ... is concerned with hypothesis formulation and testing, the analysis of the relationships between nonmanipulated variables and the development of

generalizations," (Best and Kahn, 1986, p. 24). The one-group, pretest-posttest permitted the effects of the treatment to be judged by the difference between pretest and posttest scores (Best and Kahn, 1986, p. 125).

### Sample

The videoconference was advertised across the state of Oklahoma via print and electronic media. County Cooperative Extension personnel received a media packet six weeks prior to air time of March 6, 1986, which contained a description of the videoconference, information on establishing a downlink site, a newspaper article, a radio script, newsletter article, fliers and posters, clip art of the program logo, a list of program speakers, and an idea sheet to be used in publicizing the program. In addition Oklahoma registered dietitians were mailed a copy of the program flier which indicated two hours of continuing education credits were offered to participating dietitians. Thirty-six counties had necessary equipment to offer downlink sites. Because junior livestock shows were being held in several counties, however, not all participated. Two weeks prior to the program pretests and program handouts were mailed to participating counties. After realizing the length of the pretest some counties decided against administering it to viewers. A total of 143 pretest questionnaires were returned, however, not all respondents included their name and address and could not

be sent a posttest questionnaire. One-hundred-twenty-nine posttest questionnaires were mailed one month following the videoconference. A total of 81 were returned completed.

The sample consisted therefore of those who responded to the pre- and posttest questionnaires for the beef videoconference.

## Data Collection

### Planning and Development

Planning and development of this research was accomplished in the fall of 1985, through May 1986.

### Instrumentation

The research instrument for "Eating Healthy--A Guide for Active Living" was composed of two questionnaires, one a pretest (Appendix A) administered at the downlink site prior to the program and the second, a posttest (Appendix B) mailed approximately one month after airtime. The pretest consisted of a nine page questionnaire in multiple choice, short answer and ranking scale formats with knowledge, attitude, and usage questions. It contained four sections: general demographic information; attitudes and usage; usage, purchasing practices, and sources of nutrition information used by respondents; and factors which would increase beef purchasing. Comparison of these two instruments was made to determine whether or not

changes in knowledge, attitude, or behavior had occurred since viewing the videoconference.

The posttest questionnaires were coded by number prior to being mailed to participants so responses could be matched to the appropriate pretest. The four-page questionnaire contained three sections. Questions on demographic information, which was collected on the pretest questionnaire, were not repeated. Most pretest questions were repeated in an attempt to determine if changes had occurred since attending the videoconference. In section one respondents were asked to rank the strength of their agreement with statements on the nutritional composition of beef, attitude toward beef, and their beef eating habits. Section two consisted of questions regarding the respondents beef selection and preparation preferences, eating habits and nutrition knowledge. In section three respondents indicated actions which they felt would increase the frequency of their beef purchases.

#### Survey Procedures

Viewers of "Eating Healthy--A Guide for Active Living" at participating designated downlink sites completed the pretest questionnaire immediately before the program aired March 6, 1986. Questionnaires were collected by site coordinators and returned to the food specialist within two weeks. A month later posttest questionnaires were mailed to viewers who had given complete names and addresses.

They were encouraged to respond with the promise of a gift certificate from McDonald's Restaurants for a free hamburger or order of french fries which would be sent after the completed posttest was received by the researcher.

### Data Analysis

Data was coded and computerized using the PC-File program. Standard statistical procedures, SAS, were used to analyze the data using a comparison of frequencies of responses and chi square analysis.

## CHAPTER IV

### RESULTS AND DISCUSSION

The purpose of this study was to examine the impact on consumer knowledge, attitude, and behavior toward beef of a satellite videoconference titled "Eating Healthy--A Guide for Active Living" which addressed beef nutritional and consumer issues. A pretest questionnaire was administered to viewers at designated downlink sites prior to the program. A posttest questionnaire was mailed to the viewers approximately one month after the program was viewed. A cover letter accompanied the posttest which explained the objectives of the study and asked for timely response in exchange for a gift certificate from a fast food restaurant.

#### Response to Pre- and Posttest Questionnaires

A total of 143 pretest questionnaires were returned following the program. Respondents on 121 questionnaires provided their name and address so posttest questionnaires were therefore mailed to this number. Data from completed pretests were used even if matching posttests were unavailable. The response rate for completed posttests was

sixty-seven percent (N=81). Demographic information was collected only on the pretest. F-tests from analysis of variance were used to determine if there were differences in the way the videoconference affected respondents' nutrition knowledge of beef, attitudes toward beef, beef buying practices, preparation methods used or frequency of beef consumption based on the selected demographic variables of education, employment status of the male or female heads of household, household income or the size of community in which they lived.

### Characteristics of Respondents

#### Sex and Age

Seventy-nine percent (N=113) of the respondents were females (Figure 1). Twenty-one percent (N=30) of respondents were males. The age of the respondents ranged from below 18 years of age to over 64 years (Figure 2). In the first range, less than 18 years of age, the frequency response was 4.9% (N=7), while in the second age range 18-24, the frequency response was 2.8% (N=4). In the third age range, 25-35 years of age, the frequency response was 16.2% (N=23), while in the fourth age range, 35-49, the frequency response was 26.8% (N=38). In the last two age groups, 50-64 years of age and over 64 years of age, the frequency response rates were 27.5% (N=39) and 21.8% (N=31) respectively.

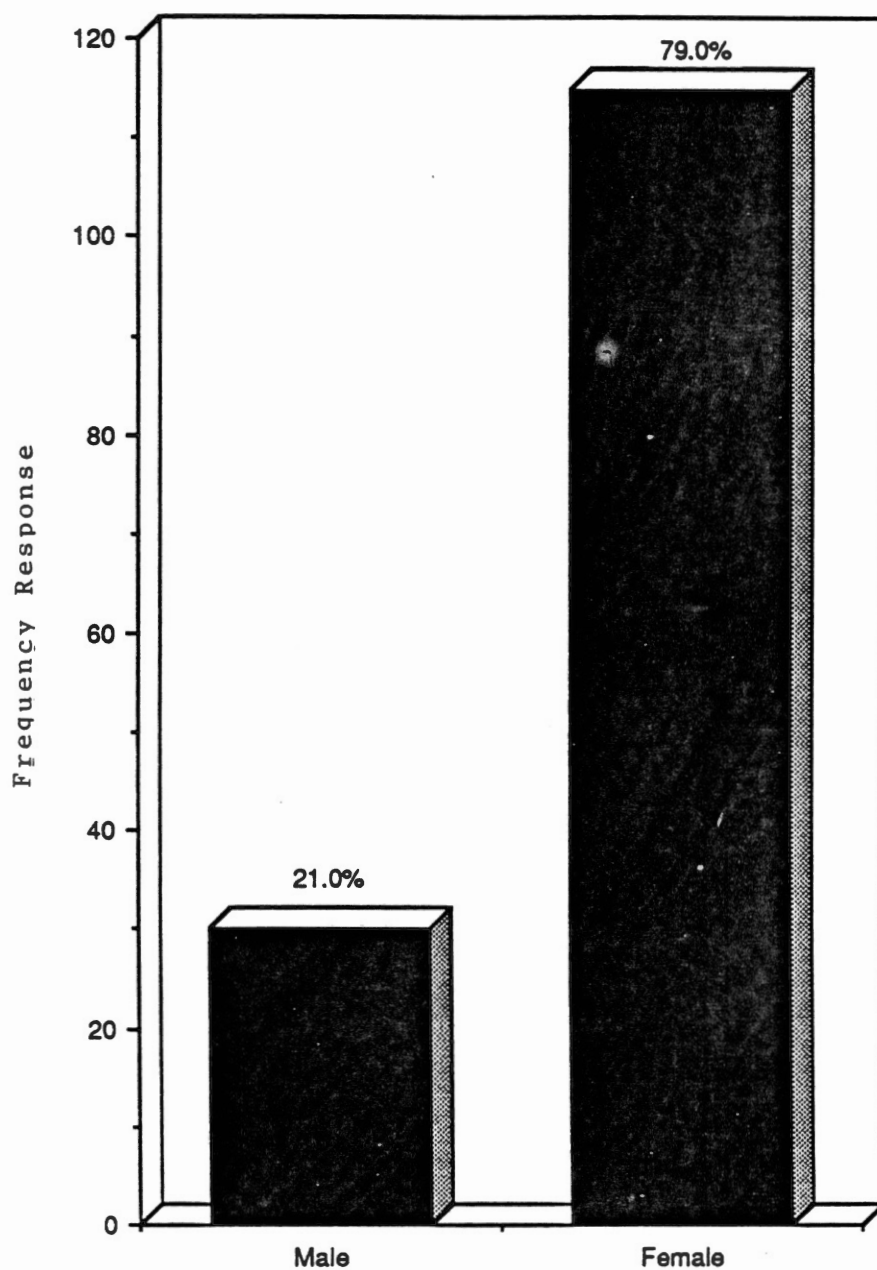


Figure 1. Classification of Beef Videoconference Pretest Survey Respondents by Sex



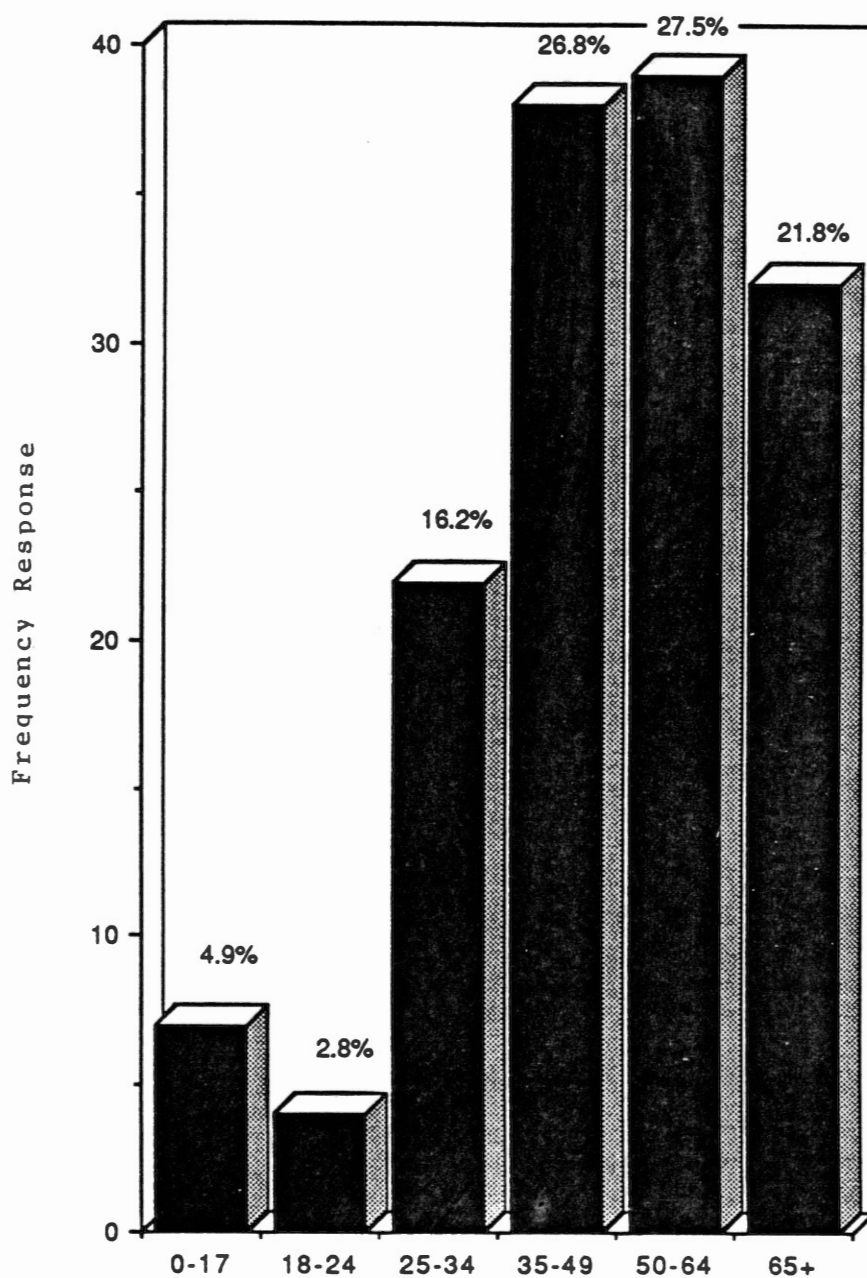


Figure 2. Age Classification of Beef Videoconference Pretest Respondents

## Education

The education level achieved by the largest number of respondents, 49.7% (N=71), was that of college graduate/post graduate (Figure 3). In the other categories the frequency response rate for those with less than high school graduation was 10.5% (N=15), for high school graduates 14% (N=20), and for some college experience 25.9% (N=37). There were no significant differences ( $p < .05$ ) found among education levels in respondent's nutrition knowledge of beef, attitudes toward beef, beef buying practices, preparation methods used or the frequency of beef consumption (Table 4). However, there were significant differences at the  $p < .06$  level for attitude. If the sample size had been larger the level of significance for differences in attitude as a result of education level attained may have proved significant at the  $p < .05$  level.

TABLE 4  
EDUCATION AS A SOURCE OF VARIATION

Response Variable	df*	ANOVA SS	F	P>F
Knowledge	3,77	95.57	2.23	.0912
Attitude	3,77	2575.38	2.58	.0593
Buying practices	3,77	13.08	0.44	.0727
Preparation methods	3,77	16.83	0.27	.0846
Frequency of consumption	3,77	126.48	1.95	.1281

\*Degrees of freedom for education and error term.

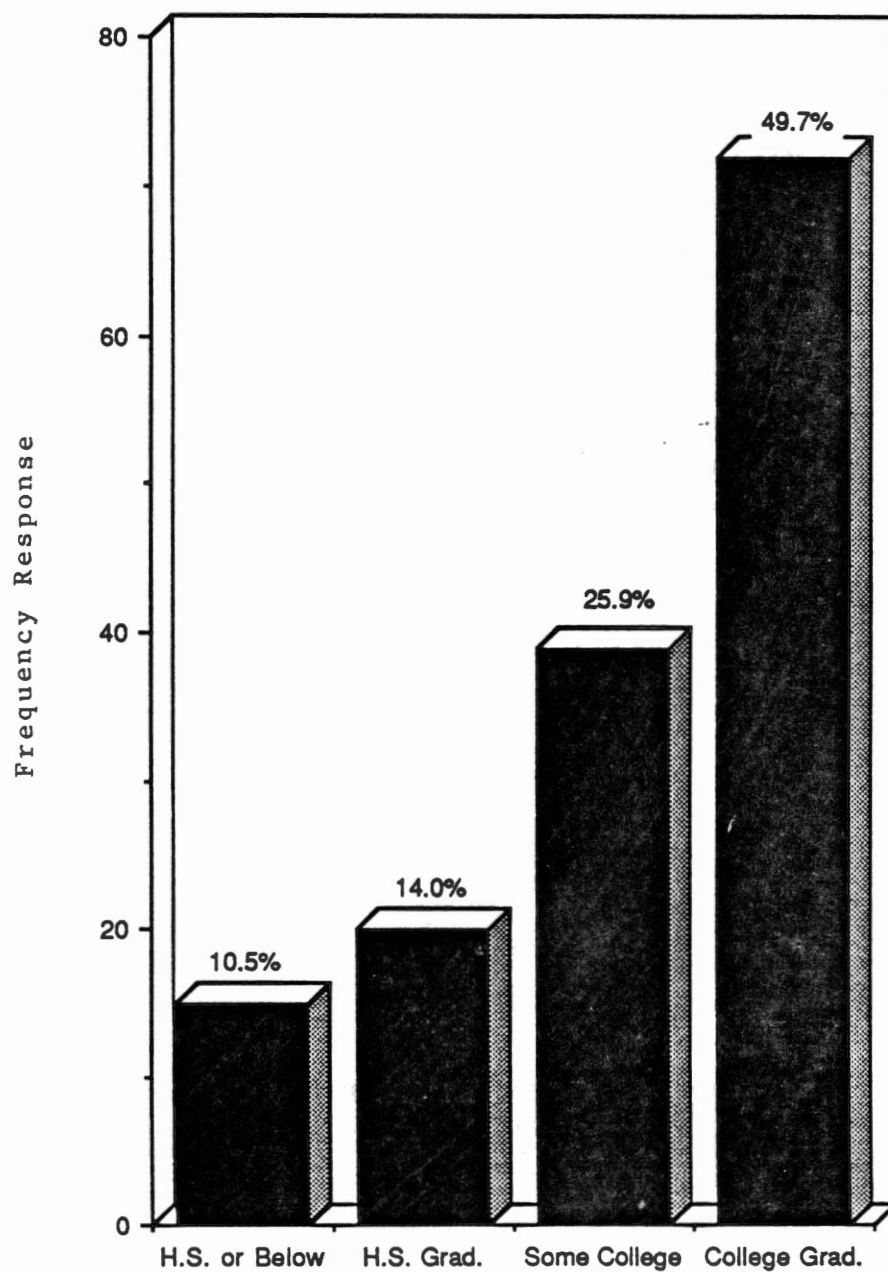


Figure 3. Education Classification of Beef Videoconference Pretest Respondents

### Household Size

Household size on the questionnaire encompassed four categories (Figure 4). The highest frequency response, 43.4% (N=62), came from two person households, followed by 3-4 person households with a frequency response rate of 26.6% (N=38), and one person households with 22.4 (N=32). Households of 5 or more people comprised only 7.7% (N=11) of the sample.

### Marital Status

Most respondents were married (N=97 or 67.8%). The frequency response for single, never married respondents was 18.2% (N=26). Widowed, divorced, and/or separated respondents had a frequency response rate of 14% (N=20) (Figure 5).

### Children Under 18 Living At Home

The greatest number of respondents (N=102 or 71%) did not have children under 18 years of age living in their household. Twenty-nine percent of respondents (N=41) did have children below 18 years still living at home (Figure 6). Of those with children at home 44% (N=18) had one child, 42% (N=17) had two children, 12% (N=5) had three children and one (2%) had four children.

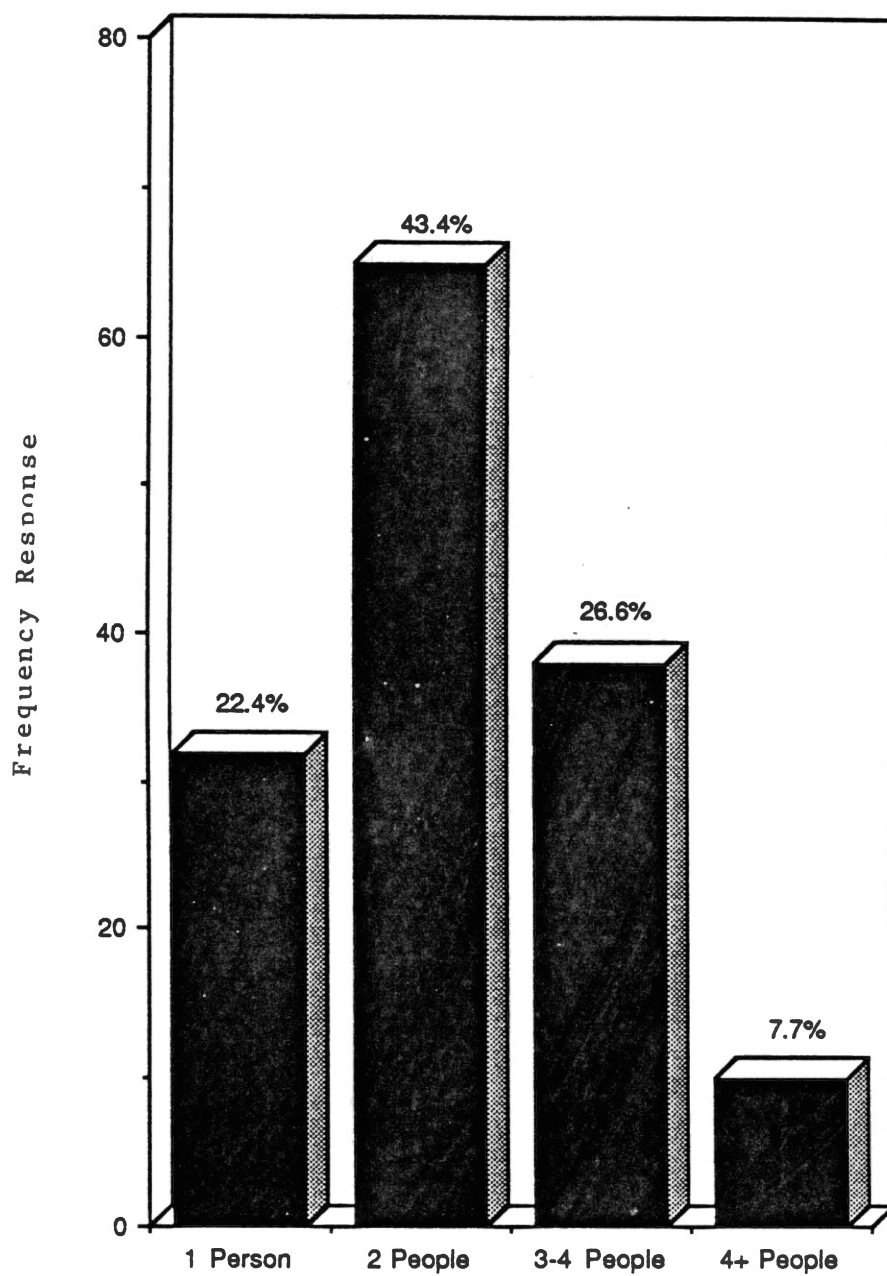


Figure 4. Household Size of Beef Videoconference Pretest Respondents

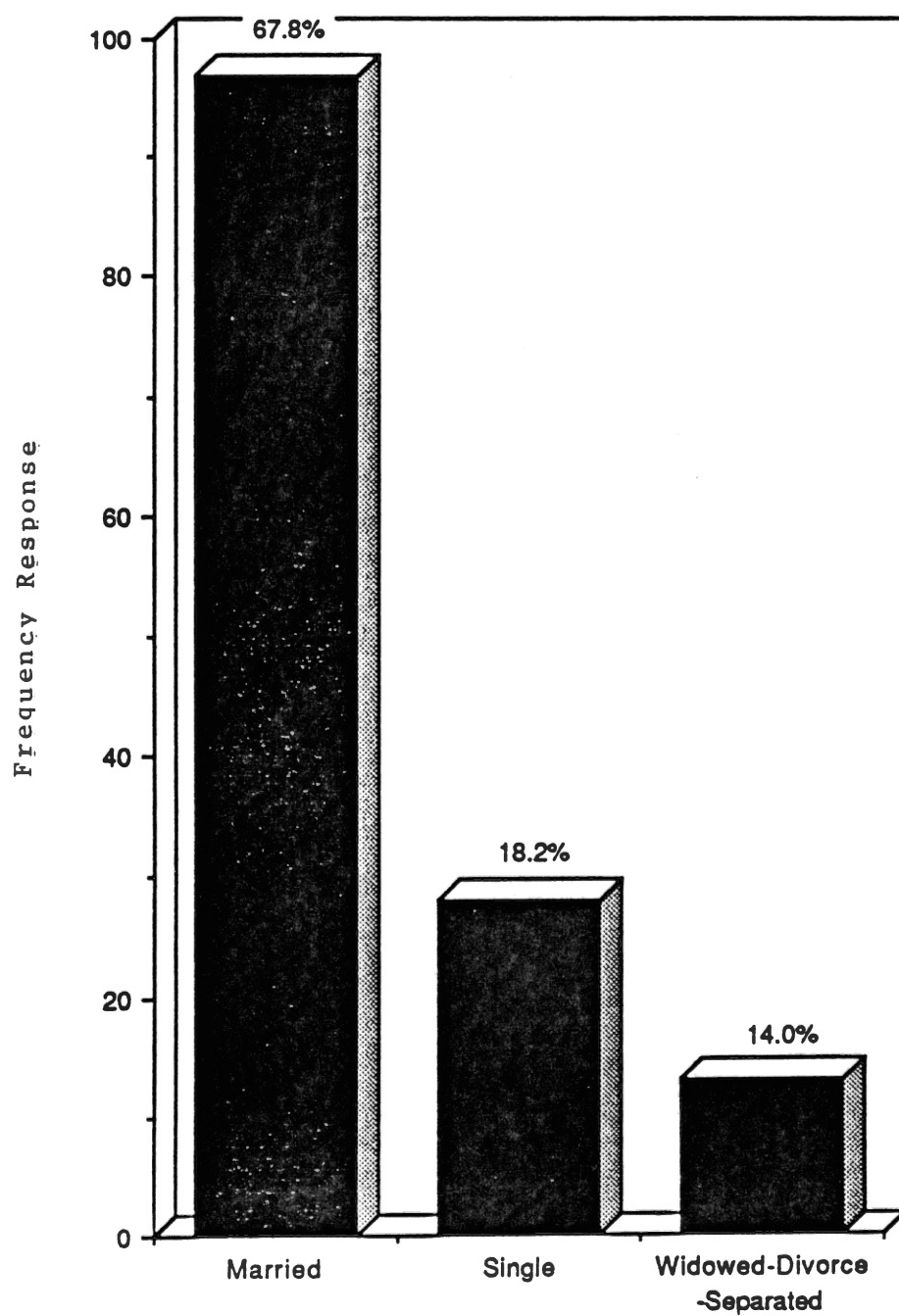


Figure 5. Marital Status of Beef Videoconference Pretest Respondents

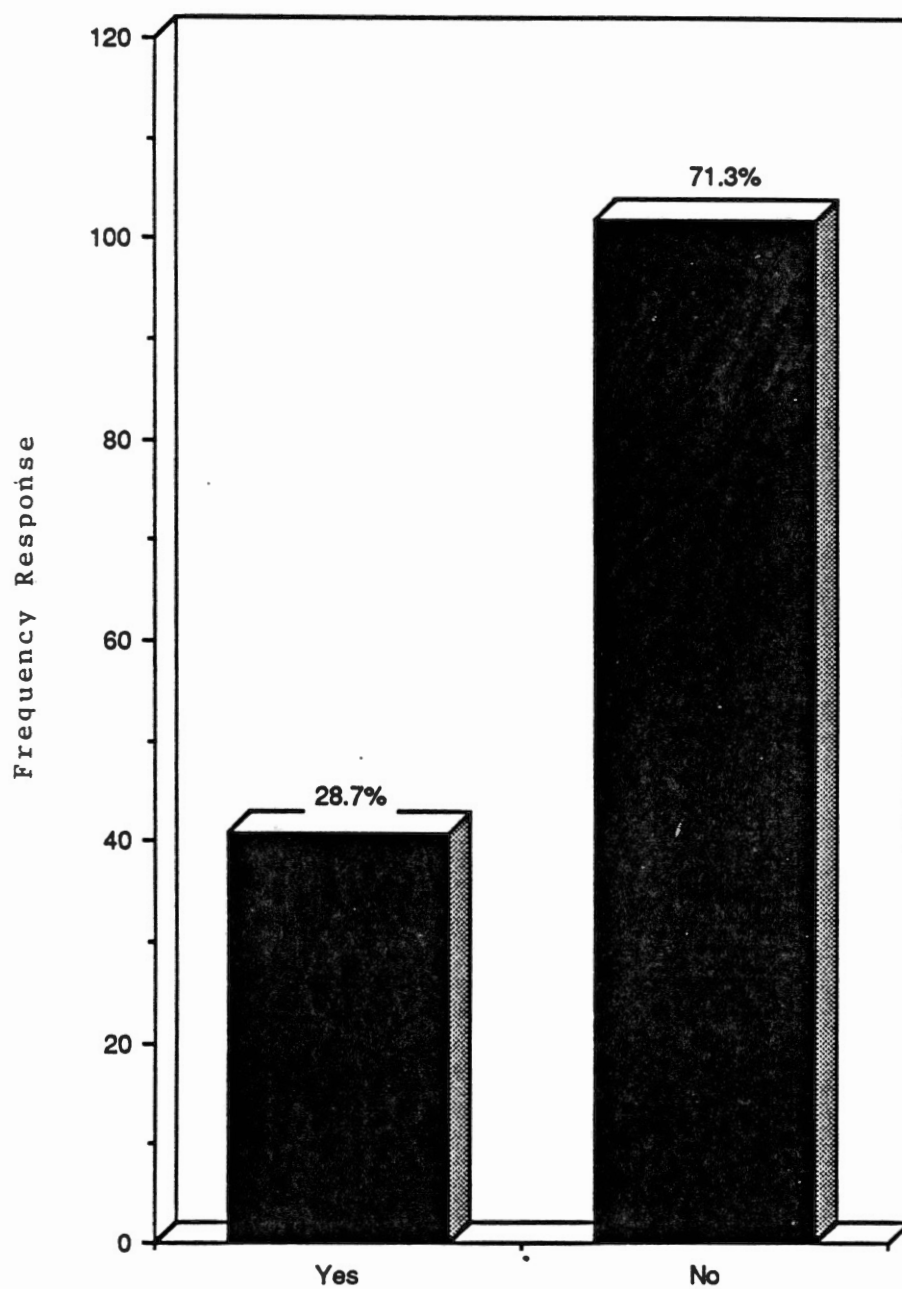


Figure 6. Beef Videoconference Pretest Respondents  
With Children 18 Years of Age  
or Younger Living at Home

### Employment Status

The employment status of both male and female heads of household is reported in Figure 7. For males 51.4% (N=73) were employed full-time outside of the home while 3.5% (N=5) were employed part-time. For females 29.8% (N=42) were employed full-time outside the home and 20.6% (N=29) were employed part-time. When these two categories are combined for each sex, employment status outside the home is very similar regardless of sex with 54.4% of men and 50.4% of women employed at least part-time outside the home. For males, 20.4% (N=29) were unemployed compared to 44% (N=62) of females. This was the largest response category for women. Households with no male head comprised 24.6 % (N=35) of the survey while 5.7% (N=8) of households had no female head. Forty-one percent (N=58) of respondents were professional such as teachers, dietitians, managers or administrators, 22% (N=31) were homemakers, 16% (N=23) were retired, 11% (N=16) were skilled labor such as secretaries, meat cutters, printers, or grocery store stockers, 6% (N=9) were students, 4% (N=5) were farmers and/or ranchers and one percent (N=1) was unemployed. Of the 68% (N=97) of married respondents 37% (N=36) reported their spouses were professionals, 18% (N=18) were farmers and/or ranchers, 18% (N=17) were retired, 12% (N=12) were skilled workers, 11% (N=11) were homemakers and 3% (N=3) were students.



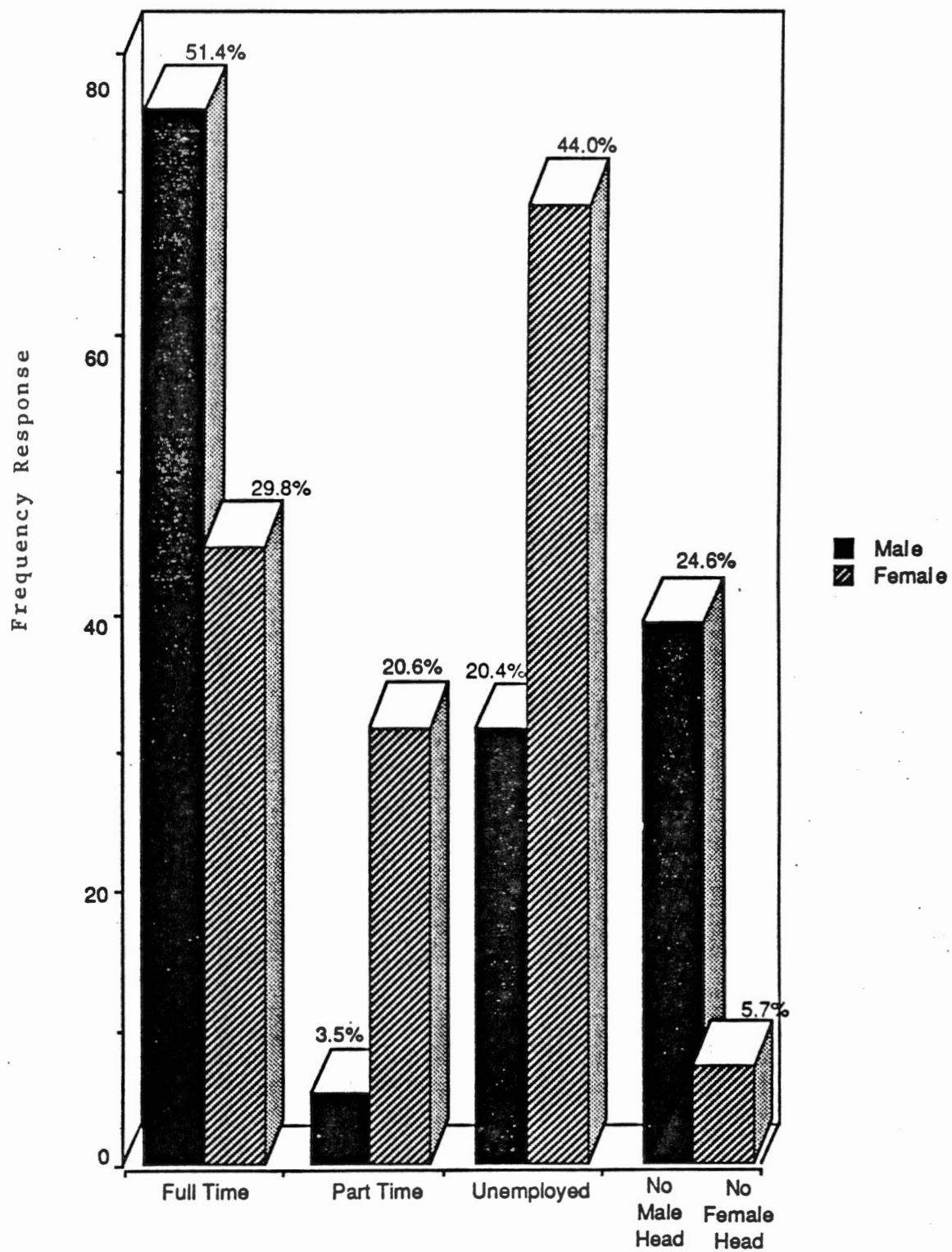


Figure 7. Employment Status of Heads of Households for Beef Videomeeting Pretest Respondents

Employment status of the male or female head of household did not result in significant differences at the  $p < .05$  level for knowledge of beef or beef buying practices (Table 5 and 6). There were significant differences in buying practices at the  $p < .07$  level due to female head of household employment status. If the sample size had been larger this differences could have proved significant at the  $p < .05$  level. There were no significant differences at the  $p < .05$  level for frequency of beef consumption due to the employment status of the male head of household but there were significant differences at the  $p < .0157$  level between categories for employment status of the female head of household. There were also significant differences at the  $p < .04$  level for attitudes toward beef and preparation methods used for beef between employment categories for both male and female head of household.

TABLE 5  
MALE HEAD OF HOUSEHOLD EMPLOYMENT STATUS  
AS A SOURCE OF VARIATION

Response Variable	df*	ANOVA SS	F	P>F
Knowledge	3,76	37.01	0.81	.4924
Attitudes	3,76	3070.88	3.16	.0294**
Buying practices	3,76	6.18	0.20	.8929
Preparation methods	3,76	170.39	3.01	.0351**
Frequency of consumption	3,76	62.67	0.93	.4311

\*Degrees of freedom for job status of male head and error term.

\*\*Significant at the  $p < .05$  level.

TABLE 6  
FEMALE HEAD OF HOUSEHOLD EMPLOYMENT  
STATUS AS A SOURCE OF VARIATION

Response Variable	df*	ANOVA SS	F	P>F
Knowledge	3,76	23.96	0.52	.6708
Attitudes	3,76	7149.09	8.82	.0001**
Buying practices	3,76	68.04	2.45	.0698
Preparation methods	3,76	270.57	5.15	.0027**
Frequency of consumption	3,76	224.54	3.68	.0157**

\*Degrees of freedom for job status of female head and error term.

\*\*Significant at the  $p < .05$  level.

#### Household Income

This question had five categories for possible responses (Figure 8). Twelve people did not respond, but of those who did answer 58.8% (N=77) had annual incomes of \$25,000 or more. The largest response category was for \$25,000-\$39,999 with 33.6% (N=44), followed by \$40,000 or more with 25.2% (N=33). Of the other respondents 10.7% (N=14) reported an annual income less than \$10,000, 18.7% (N=18) reported \$10,000-\$14,999, and 16.8% (N=22) reported an income of \$15,000-\$24,999 per year. There were no significant differences found between income categories for nutrition knowledge of beef, beef buying practices or frequency of beef consumption (Table 7). Preparation methods used for beef were not significant at the  $p < .05$  level; however, there were significant differences between income categories at the  $p < .0551$  level. If the sample size

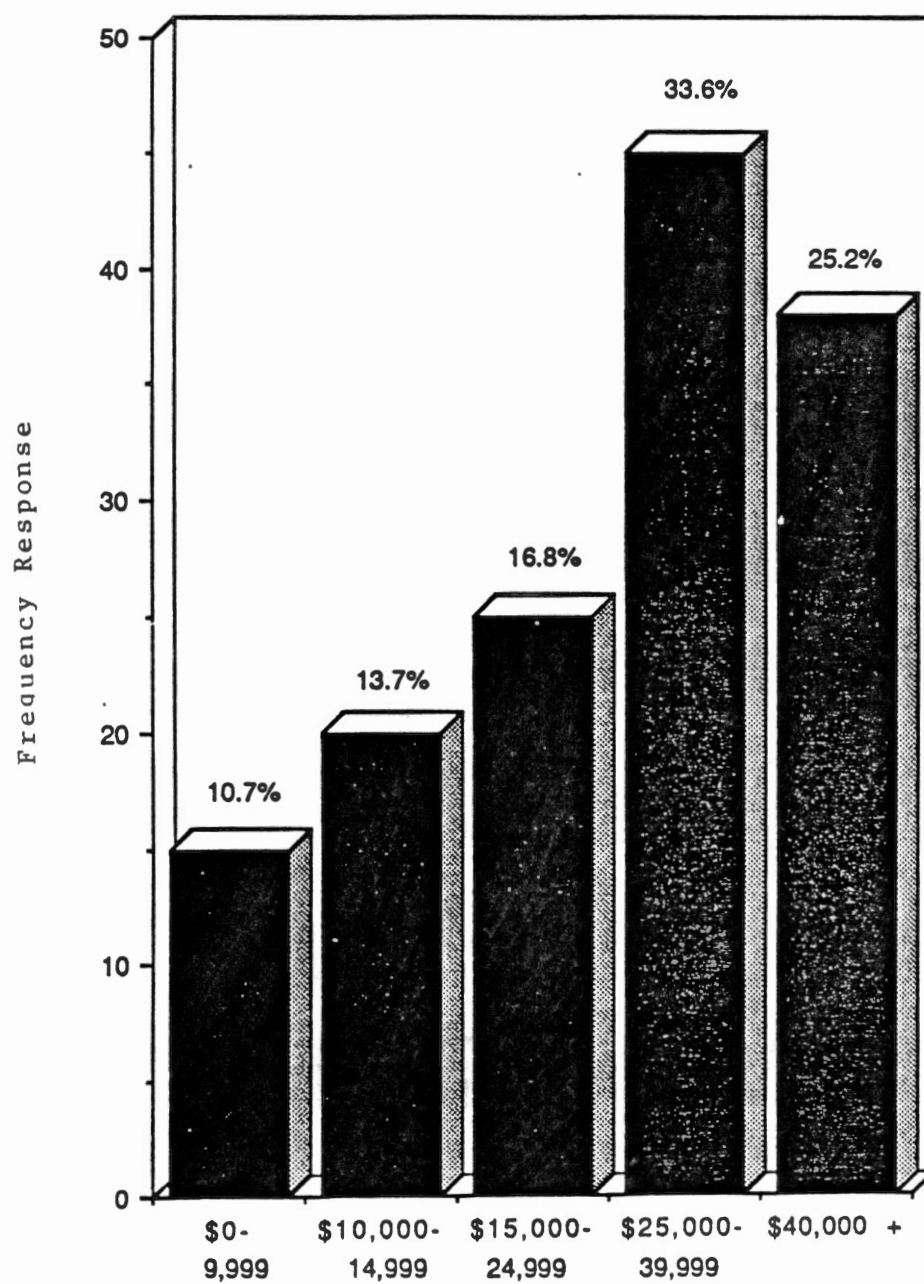


Figure 8. Classification of Beef Videoconference Respondents by Household Income

had been larger this could have proved significant at the  $p < .05$  level. There were significant differences in attitude toward beef at the  $p < .0204$  level.

TABLE 7  
INCOME AS A SOURCE OF VARIATION

Response Variable	df*	ANOVA SS	F	P>F
Knowledge	4,71	25.54	0.41	.8042
Attitude	4,71	4088.73	3.11	.0204**
Buying practices	4,71	54.42	1.43	.2336
Preparation methods	4,71	185.51	2.43	.0551
Frequency of consumption	4,71	71.14	0.76	.5516

\*Degrees of freedom for income and error term.

\*\*Significant at the  $p < .05$  level.

#### Community Size

There was a fairly uniform distribution of respondents from each of the categories for this question (Figure 9). Residence in a small city, population between 25,000 to 250,000, was the largest frequency response rate with 35.5% (N=49) followed by those who lived in rural areas (N=42 or 29.6%). The frequency response for towns with a population under 25,000 was 21.1% (N=30). The lowest frequency response (N=21 or 14.8%) was for large cities with a population over 250,000. There were no significant differences in nutrition knowledge of beef, attitude toward beef, preparation methods or frequency of consumption of

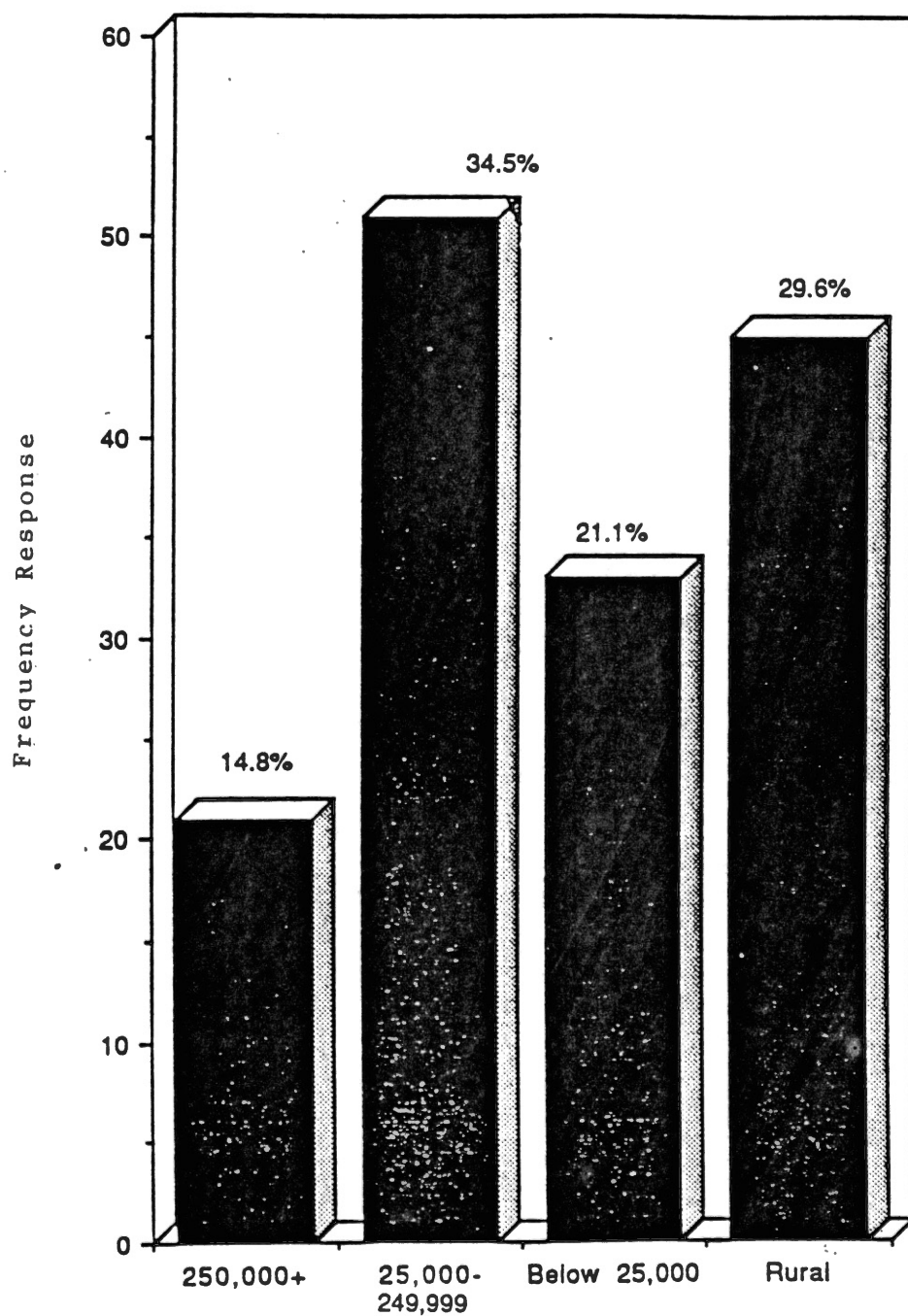


Figure 9. Classification of Beef Videoconference Respondents by Community Size

beef between community size categories (Table 8). There was a significant difference in buying practices at the  $p < .0032$  level.

TABLE 8  
COMMUNITY SIZE AS A SOURCE OF VARIATION

Response Variable	df*	ANOVA SS	F	P>F
Knowledge	3,77	29.29	0.65	.5884
Attitudes	3,77	318.54	0.29	.8299
Buying practices	3,77	127.50	5.00	.0032**
Preparation methods	3,77	43.86	0.72	.5425
Frequency of consumption	3,77	38.07	0.56	.6441

\*Degrees of freedom for community size and error term.

\*\*Significant at the  $p < .05$  level.

### Food Purchasing

Most respondents (N=94 or 65.7%) had the primary responsibility for food purchasing (Figure 10). In the other categories 15.4% (N=22) respondents indicated their spouse or housemate held primary responsibility, 5.6% (N=8) reported a child had primary responsibility, and 13.3% (N=19) shared the primary responsibility.

### Food Preparation

The primary responsibility for food preparation fell to 65% (N=93) of participants who were also the respondent (Figure 11). Of the remaining respondents, 15.4% (N=22)

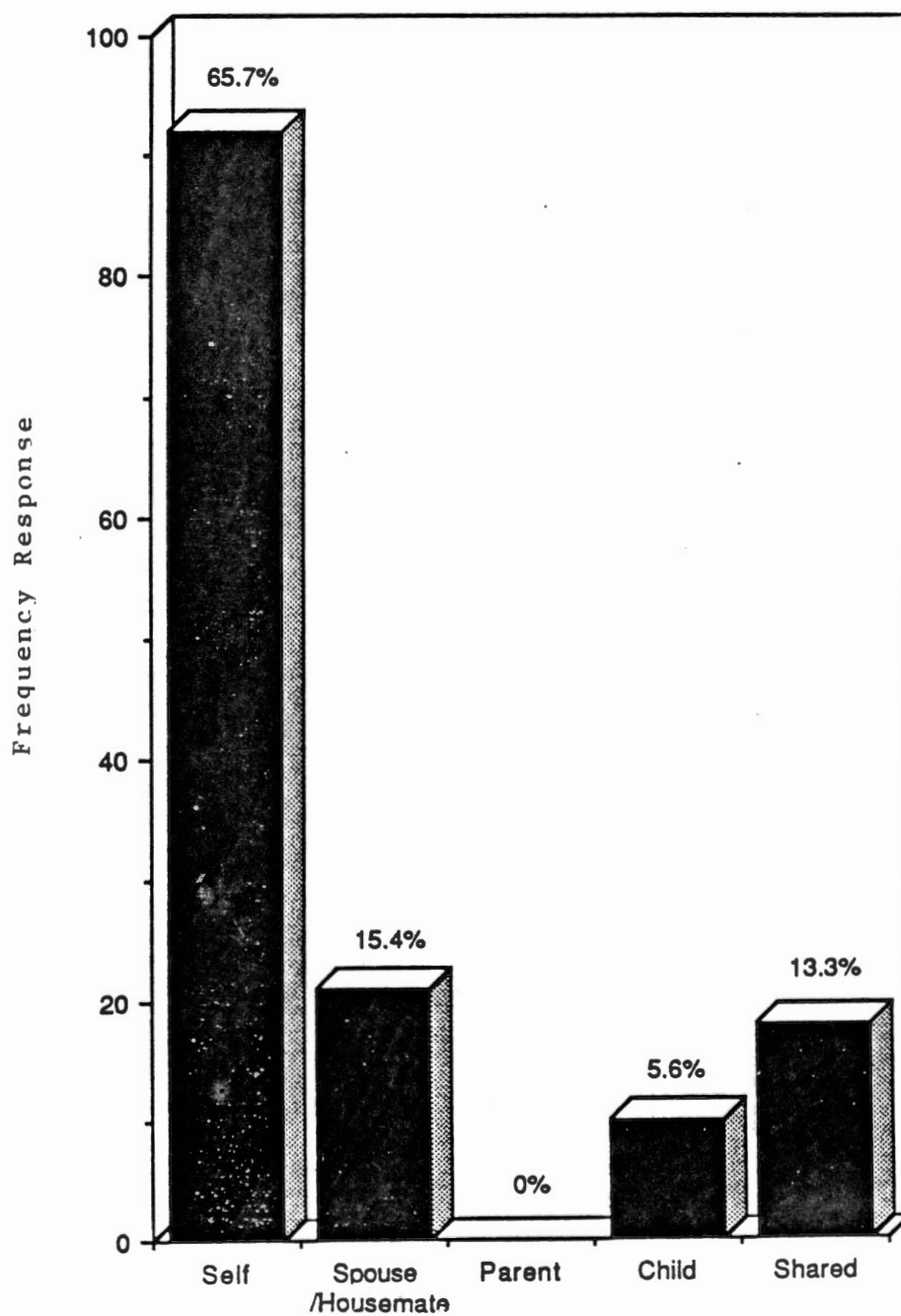


Figure 10. Primary Food Purchasing Responsibility  
In Households of Beef Videoconference  
Respondents



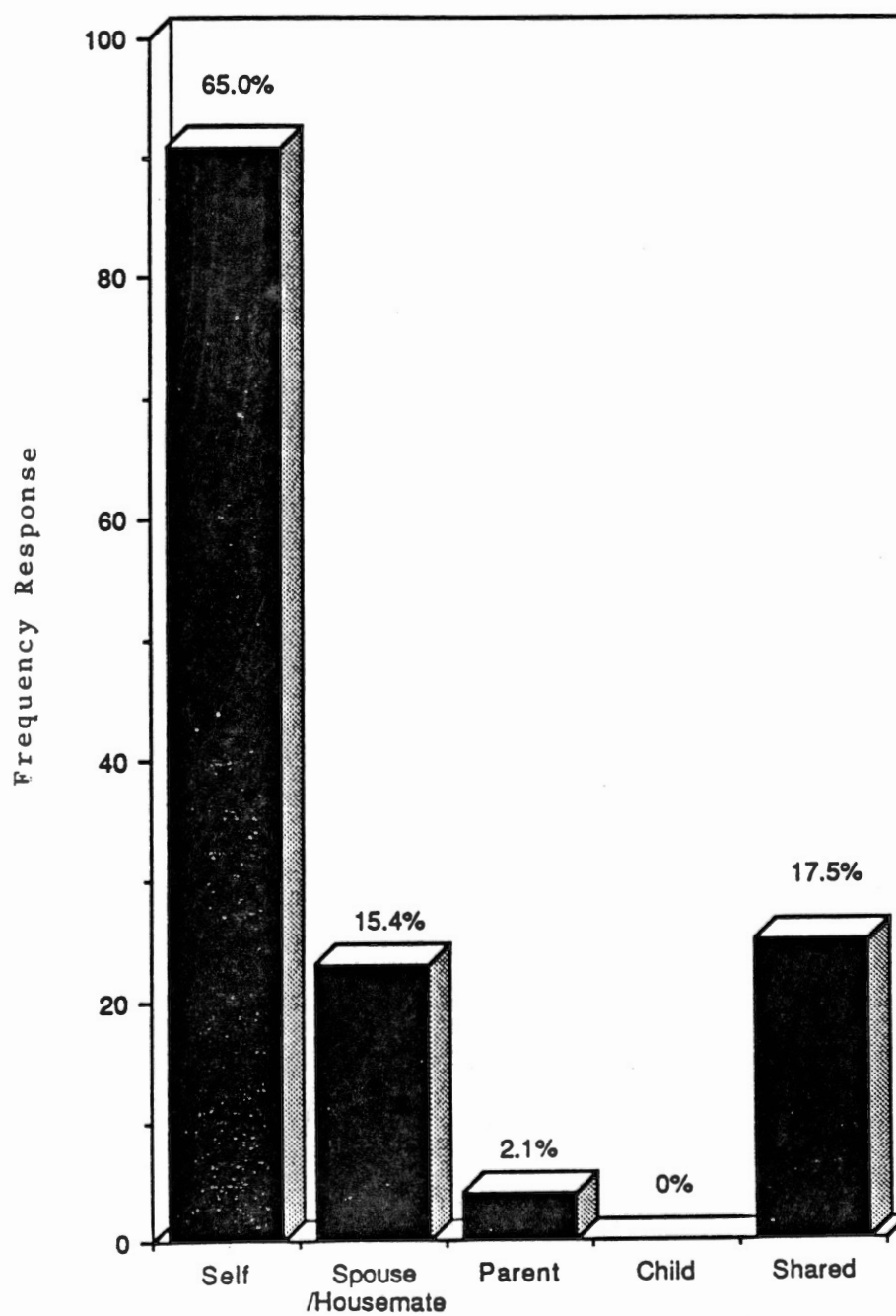


Figure 11. Primary Food Preparation Responsibility  
In Households of Beef Videoconference  
Respondents

indicated a spouse or housemate had primary responsibility for food preparation, 17.5% (N=25) shared the primary responsibility. A parent had primary responsibility for 2.1% (N=3) of respondents.

#### Effects of Videomeeting on Viewers' Knowledge of and Attitude Toward Beef

Results from the pretest/posttest comparison are based on the respondent having returned both tests and having answered corresponding questions on each. A sequence of four questions asked respondents to indicate the strength of their agreement or disagreement with statements about beef and their general eating practices. Examination of the results indicated questions had chi-square expected counts less than five and chi-square was not a valid test. It was possible to examine trends when frequency responses which indicated disagreement were combined and compared to a combination of those which indicated agreement.

The first question asked participants to indicate the strength of their agreement or disagreement with eight brief statements about beef. After viewing the videoconference fewer participants indicated beef was "hard to cook" or "time consuming to cook" (Table 9). After the program there was a larger number of viewers who indicated they agreed that beef was "high cost", "high calorie", "needed for good health" and "heavy." The strongest trends were toward increased agreement with the statements that

beef is "a good nutrition choice" and "a good food buy."  
 The videoconference did not have a positive impact on all facets of viewer attitude toward beef but it did improve some aspects of consumer perceptions about beef.

TABLE 9  
 FREQUENCY RESPONSE RATES FOR DEGREE OF  
 AGREEMENT WITH STATEMENTS ABOUT BEEF

Statement	Total	Disagree		Agree		Neither	
		Pre	Post	Pre	Post	Pre	Post
Beef is high cost	74	18	14	25	32	31	28
Beef is hard to cook	72	50	50	12	7	10	
15							
Beef is high calorie	72	29	19	13	20	30	33
A good nutrition choice	77	9	2	56	69	12	6
Needed for good health	75	11	12	50	53	14	10
Beef is heavy	72	32	24	17	22	23	26
A good food buy	75	11	5	42	55	22	15
Time consuming to cook	74	36	39	13	12	25	23
I don't like beef	72	60	60	8	8	4	4
Beef is satisfying	78	5	2	64	70	9	6
Beef is liked by all	74	15	11	30	37	29	26
Does not taste good	71	60	64	5	4	6	3
It is versatile	75	7	3	57	67	11	5
Children like beef	72	9	2	46	51	17	19
High in fat	76	28	28	21	19	27	29
Low in cholesterol	76	26	25	17	22	33	29
Wholesome	77	8	2	56	64	13	11
More nutritious							
than chicken	76	23	15	27	40	26	21
Less nutritious							
than fish	74	40	46	12	8	22	20
High in iron	74	6	2	51	54	17	18
Low in sodium	71	13	12	31	31	27	28
A good protein source	77	5	4	70	72	2	1
A food that gives							
strength	74	7	5	57	58	10	11

In the second question, respondents were asked to indicate the strength of their agreement or disagreement with six statements about beef. When responses for disagreement were compared to those indicating agreement, trends were visible. In general the videoconference improved viewers' attitude toward beef (Table 9). There was no difference between pre- and posttest scores for the statement "I don't like beef" to which 83% (N=60) of respondents indicated disagreement. There was increased disagreement with the statement "beef does not taste good" indicating a larger number of viewers enjoy the flavor of beef after viewing the program. There was an increased number of respondents who agreed with each of the remaining four statements after viewing the videoconference indicating that the program improved respondents' perceptions that beef is satisfying, liked by everyone, versatile, and liked by children.

The third question asked respondents to indicate the strength of their agreement or disagreement with nine statements about the nutritional contributions of beef to the diet (Table 9). Little change was observed between pre- and posttest scores for the statement that beef is "low in sodium", however 72% (N=51) indicated an initial agreement with the statement. Positive trends were found for the statements that beef is "high in fat", "low in cholesterol", "high in iron", "low in sodium", "a good protein source" and "a food that gives strength" where a

greater number of respondents had a better knowledge of beef after the videoconference. The greatest positive changes were for statements that beef is "wholesome", "more nutritious than chicken" and "more nutritious than fish." The videoconference increased participants knowledge of the nutritional contributions of beef to the diet and enhanced the image of beef when compared to other animal protein foods.

The fourth question in the sequence asked respondents to indicate the strength of their agreement with statements regarding general eating habits (Table 10). Four of the statements were used on both the pre- and posttests with a slight change of wording. On the pretest respondents were to compare current eating habits with those of the two previous years. The posttest required the comparison of current habits with those practiced prior to viewing the videoconference. Trends from the results indicate that 41% (N=31) of respondents agreed they served more light meals than two years ago. Forty percent (N=30) agreed that they served more light meals after the videoconference. Fifty-one percent (N=37) of respondents indicated they did not serve larger meat portions than two years ago while 14% (N=10) indicated that they did. Fifty-two percent (N=38) indicated on the posttest that they disagreed with the statement that they "serve larger beef portions" since viewing the videoconference while 15% (N=11) indicated agreement with the statement. Fifty-six percent (N=41) of

pretest respondents indicated disagreement with the statement that they "ate more frozen entrees or dinners" than two years ago while 18% (N=13) agreed. After the videoconference 80% (N=59) responded that they disagreed that they ate more frozen entrees or dinners than prior to the videoconference. No one indicated a strong agreement to this statement after the videoconference. Fifty-four percent (N=41) of pretest respondents indicated disagreement with the statement that they "eat beef less often" than two years ago. Twenty-nine percent (N=22) indicated agreement. Of posttest respondents 62% (N=47) disagreed with a similiar statement regarding the frequency of beef consumption since the videoconference while only 12% (N=9) agreed. The videoconference did not result in changes in the number of light meals served, in the size of beef portions served, the number of frozen entrees or dinners eaten or the frequency of beef consumption. Trends visible from examination of questions asked only on the pretest indicate that the larger percentage of respondents did not eat out more often (N=54 or 41%), skipped breakfast less often (N=54 or 43%) and ate more cold main dishes than two years ago.

TABLE 10  
FREQUENCY RESPONSE RATES FOR AGREEMENT  
WITH STATEMENTS ABOUT EATING  
PRACTICES

Statement	Total	Disagree		Neither		Agree	
		Pre	Post	Pre	Post	Pre	Post
		N	N	N	N	N	N
Serve fewer light meals	75	31	30	21	39	23	6
Serve larger meat (beef) portions	73	37	38	26	24	10	11
Eat beef less often	73	41	59	19	10	13	4
Eat out more often*	132	54	--	28	--	50	--
Skip breakfast less often*	126	48	--	24	--	54	--
Eat more cold main dishes*	129	24	--	36	--	69	--

\*Statements were on pretest only.

### Effects of Videomeeting on Viewers'

#### Use of Beef

In general the videoconference did not affect the number of times per week viewers consumed fresh beef, ground beef, chicken, pork, or fish. Consumption of each product remained at zero to four times per week for each of the foods for most viewers. Changes which did occur were generally from consumption of five or more servings per week to four or less. This was most pronounced for fresh beef where viewers who reported a consumption level of five or more times per week on the pretest (N=20) significantly reduced (adjusted chi square=5.14,  $p<.025$ ) the number of

times they reported eating fresh beef per week to four or less. Consumption levels reported for ground beef, chicken, pork, and fish followed this same pattern but changes were not significant at the  $p < .05$  level.

Viewing "Eating Healthy--A Guide for Active Living" did not result in a change in the size of beef serving usually eaten by participants. Posttest respondents were asked to report the number of ounces in their usual serving of beef and to indicate if the serving size had changed since viewing the videoconference. None of the respondents reported eating no beef. The frequency response rate was greatest for 3-4 ounce servings (N=51 or 64%) followed by 5-6 ounce servings (N=17 or 21%), 1-2 ounce servings (N=10 or 13%) and 6 or more ounces per serving (N=2 or 3%). Eighty-six percent (N=69) of respondents did not change their usual size of beef serving after viewing the program. Of those who had changed, more decreased (N=8 or 10%) than increased (N=3 or 4%) their usual serving size of beef. Nutritionists generally recommend a serving size of three ounces of cooked meat for healthy adults so those who reported a usual serving size of 3-4 ounces did not need to make a change for nutritional reasons. The purpose of the videoconference was not specifically to increase or decrease beef consumption but to inform viewers of the nutritional contributions which beef makes to the diet. If a dietary change were a primary objective of the videoconference for the target population, a broader,



multifaceted educational experience would have been indicated.

Information shared during the videoconference stressed the importance of a reduction in total dietary fat and indicated that this could be done, in part, without elimination of beef from the diet but by trimming excess fat before cooking, draining excess fat after cooking where appropriate, and trimming remaining fat before eating if possible. The program did result in significant behavioral changes ( $p < .05$ ) for two of those practices. Eighty-four percent ( $N=62$ ) of respondents (significant at the  $p = .017$  level) who did not trim the fat from beef before cooking prior to the videoconference did trim it after viewing the program. There was a significant reduction ( $p = .002$ ) of 93% ( $N=74$ ) in the number who ate trimmable beef fat after viewing the program. There was not a significant change in the number of respondents who trimmed or drained fat after cooking beef. Sixty-four ( $N=59$ ) respondents indicated they had adopted this practice after the videoconference but a similar proportion (57%,  $N=22$ ) indicated they no longer followed this practice.

Examination of the frequency response rates for pre- and posttest questions which asked respondents to indicate how often six beef cookery methods were used to prepare the beef they ate revealed that changes occurred after the videoconference. Because a large number of the chi-square cells had expected values less than five, chi-square

analysis was not used. Frequency response data for categories 1 and 2 were combined to examine trends for less used methods and categories 4 and 5 were combined to evaluate trends in more used cookery methods (Table 11). Prior to the program the most used cookery method was roasting (N=47 or 56%) followed by broiling/grilling (N=39 or 49%), stewing/braising (N=27 or 34%), microwaving (N=17 or 21%), frying (N=16 or 20%) and stir-frying (N=9 or 11%). The greatest changes after the videoconference were a decrease in the number of respondents who indicated much of their beef was stewed or braised (posttest N=18 or 23%), a decrease in the use of microwaving (posttest N=8 or 10%) and an increase in the use of broiling/grilling (posttest N=50 or 63%). There was also a decrease in the number of respondents who indicated frying as a much used method (posttest N=13 or 16%). The videoconference emphasized the need to preserve the low to moderate fat characteristics of beef during preparation by choosing methods which did not add fat during cooking. The increased choice of beef cooked by broiling, grilling and stir-frying along with decreased choice of frying as a cooking method indicate the program had an impact on viewers. With the exception of microwaving, respondents also increased their selection of cookery methods which reduced preparation time and added minimal fat to the finished dish such as broiling, grilling and stir-frying.

TABLE 11  
FREQUENCY RESPONSE RATES FOR DEGREE OF  
USE OF SIX BEEF COOKERY METHODS  
(TOTAL=80)

Method	More Used				Used				Less Used			
	Pre		Post		Pre		Post		Pre		Post	
	N	%	N	%	N	%	N	%	N	%	N	%
Roasting	47	56	43	54	15	19	19	24	18	23	18	23
Stewing/ braising	27	34	18	23	17	21	13	16	27	34	49	61
Broiling/ grilling	39	49	50	63	19	24	16	20	22	28	14	18
Frying	16	20	18	16	18	23	18	23	46	58	49	61
Stir- frying	9	11	12	15	14	18	10	13	57	71	58	73
Micro- waving	17	21	8	10	6	8	5	6	57	71	67	84

Examination of the results from the question on factors which impacted beef consumption indicated there was not enough change for the chi-square to be applied, however it was possible to discuss trends. In general if the viewer responded on the pretest that the factor in question had an impact on beef consumption no change was seen on the posttest. The one factor where this trend was weak was "cost of beef" where 35% (N=42) of respondents who initially said cost was a factor in the amount of beef they ate indicated on the posttest that it was not. Of those who reported cost of beef to be a factor (N=27), 63% (N=17) indicated it to be a positive factor while 37% (N=10) indicated it had a negative impact on their beef consumption (Table 12). The categories "lack of skill,"

"lack of facilities," and presence of "additives" or growth promotants were indicated by very few respondents as having an impact on the amount of beef eaten. Viewers who responded on the pretest that factors listed had an impact on the amount of beef they ate continued to report factors impacted beef consumption on the posttest. They also indicated on the posttest that, in general, the impact was positive.

TABLE 12  
CHANGE IN FREQUENCY RESPONSE RATES FOR  
THOSE INITIALLY REPORTING AN IMPACT  
OF SPECIFIC FACTORS ON THE  
AMOUNT OF BEEF EATEN

Factor	Total	Positive Change		Negative Change		No Change	
		N	%	N	%	N	%
Health Concerns	46	39	13	1	2	6	85
Fat Content	27	18	15	5	18	4	67
Cholesterol Content	26	14	27	5	19	7	54
Sodium Content	14	7	43	1	7	6	50
Iron Content	35	30	14	0	0	5	86
B-vitamin Content	24	3	12	0	0	21	88
Ease of Preparation	51	43	12	2	4	6	84
Lack of Skill	6	4	33	0	0	2	67
Lack of Facilities	6	3	50	0	0	3	50
Cost of Beef	42	17	36	10	24	15	40
Cost of Other Meats	27	16	30	3	11	8	59
Caloric Content	24	16	33	0	0	8	67
Additives	9	5	11	3	33	1	56
Availability of Other Proteins	23	6	26	4	17	13	57

Videomeeting viewers who responded that specific factors on the pretest questionnaire had no impact on the amount of beef they ate were more apt to have changed their opinion on the posttest than those who initially reported specific factors did have an impact on their beef consumption (Table 13). With the exception of "lack of facilities," and "additives and growth promotants" respondents who changed their "no impact" opinion consistently indicated the factors had a more positive than negative impact on the amount of beef they ate. This was the perception of a larger percentage of respondents. The largest changes were for "health concerns", "iron content", "B-vitamin content" and "ease of preparation" where at least 49% of respondents reported each factor had a positive impact on the amount of beef they ate after viewing the videoconference. Even though those who changed their opinion were most apt to indicate a positive impact of each factor, more than 50% of respondents did not change their opinion for nine of the 14 factors.

TABLE 13

CHANGE IN FREQUENCY RESPONSE RATES FOR  
THOSE INITIALLY REPORTING NO IMPACT  
BY SPECIFIC FACTORS ON THE  
AMOUNT OF BEEF EATEN

Factor	Total	Positive Change		Negative Change		No Change	
		N	%	N	%	N	%
Health Concerns	35	22	63	0	0	13	37
Fat Content	54	19	35	10	19	25	46

TABLE 13 (continued)

Cholesterol Content	55	16	29	10	18	29	53
Sodium Content	67	19	28	5	8	43	64
Iron Content	46	27	59	1	2	18	39
B-vitamin Content	57	28	49	0	0	29	51
Ease of Preparation	30	15	50	2	7	13	43
Lack of Skill	75	11	15	6	8	58	77
Lack of Facilities	75	8	11	10	13	57	76
Cost of Beef	39	11	28	9	23	19	49
Cost of Other Meats	54	21	39	5	9	28	52
Caloric Content	57	24	42	3	5	30	53
Additives	72	11	15	20	28	41	57
Availability of Other Proteins	58	21	36	7	12	30	52

Respondents were asked on the pretest to indicate where they purchased most of the beef they ate at home. The frequency response rate was highest for supermarket purchases (N=95 or 66.9%) which was more than twice as large as the second largest category of slaughter of a family owned animal (N=44 or 31.0%) (Figure 12). The number who slaughtered a family owned animal was very close to the number who lived in rural areas (N=42 or 29.6%) (Figure 9). Since over fifty percent of the population lived in towns with populations below 25,000 or rural areas which provide fewer food buying choices it was not surprising that the frequency responses were lower for beef purchased to be eaten at home from restaurants (N=24 or 16.9%), meat markets (N=21 or 14.8%), direct from ranchers (N=6 or 4.2%), special distributor sales at motels, service stations or department stores (N=3 or 2.1%), or delis (N=0).

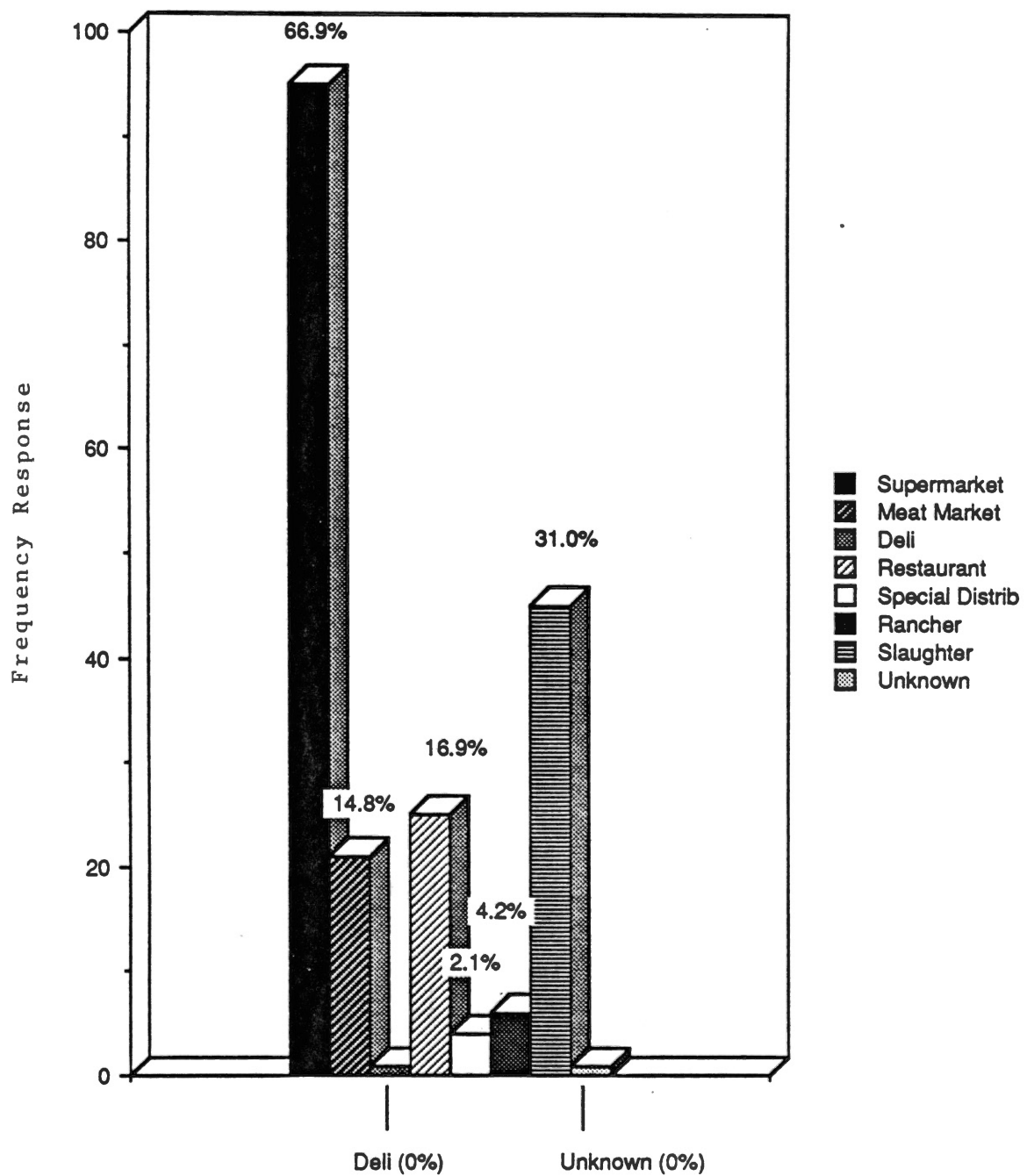


Figure 12. Primary Purchase Point of Beef for Videoconference Pretest Respondents

Examination of the results from the question which asked how often a variety of beef items were eaten at home during a typical week indicated a low response in several categories which prevented a valid analysis by use of chi-square. To reduce the number of cells with a low expected count, data from several categories were combined. This resulted in an analysis of the question, "in a typical week, do you eat each of the following beef items at home: yes or no." In general those who reported they ate a specific beef product on the pretest continued to eat it during a typical week following the videoconference. Consumption changes which did occur were most often from "not eating" a beef product to eating the product during a typical week (Table 14). The product for which the least change was seen between the pre- and posttest responses was ground beef where 73 of the 78 pretest respondents indicated they did consume ground beef in a typical week. The five respondents who did not previously eat ground beef prior to the videoconference indicated on the posttest that they now did so. There was not enough change in the frequency of ground beef consumption to apply chi-square analysis.

Steaks were eaten weekly by most respondents both before and after the videoconference (N=55). Only four of those who reported eating steaks on the pretest indicated a change on the posttest. However, of those who did not report eating steak in a typical week before the



videoconference (N=20) a significant number (N=9,  $p<.005$ ) indicated on the posttest they they now did. Among those who reported on the pretest that they did not eat roast during a typical week (N=14) 50% (N=7) changed after viewing the videoconference (adjusted chi-square  $p<.025$ ). The greatest change between pre- and posttest responses was for those who did not typically eat processed beef. Over 50% (N=32) of those who originally indicated they did not eat processed beef in a typical week (N=60) responded that after viewing the videoconference they now ate processed products (adjusted chi-square  $p<.016$ ). Similar but smaller changes were apparent for liver and frozen entrees containing beef where 28% of those who initially indicated they did not eat either of those products in a typical week changed to a positive response after viewing the videoconference (chi-square  $p<.000$ ). Little change was reported for canned beef products. Most respondents (N=66 or 84%) indicated they did not eat canned beef either before or after the videoconference. There was not a significant change between pre- and posttest scores ( $p<.250$ ).

TABLE 14  
CONSUMPTION CHANGES FOR BEEF PRODUCTS  
DURING A TYPICAL WEEK AFTER  
VIEWING THE VIDEO MEEING

Product	No- No N	No to Yes N	Yes- Yes N	Yes to No N	Chi- Square	p<
Steak	20	9	59	4	11.89*	.005+
Ground	5	5	73	0	--	--
Roast	14	7	65	6	5.81*	.025+
Processed	60	32	19	3	5.77	.016+
Liver	58	16	20	3	20.08	.000+
Frozen						
Entrees	54	15	25	4	21.78	.000+
Canned	72	6	7	4	1.93*	.250

\*Adjusted chi-squares used when 25% of the cells had expected counts less than 5.

+Significant at  $p < .05$  level.

Pretest respondents were asked to choose the entree item which they were most likely to order at a restaurant or fast food restaurant. On the posttest respondents were asked to respond to each of the situations separately by indicating which main dish item they would most likely order at a restaurant and which would be their most likely choice at a fast food restaurant. Table 15 compares pretest choices to posttest restaurant entree choices while Table 16 compares pretest scores to posttest entree choices at fast food restaurants. Beef was the overwhelming choice for those eating at restaurants. Fifty-three of 78 respondents indicated they would be most likely to choose beef when they ate at a restaurant both before and after

the videoconference (Table 15). Of the 22 who initially indicated beef would not be selected, 50% reported it would be the most likely choice for a restaurant meal. Thirty-eight percent (N=30) of pretest respondents indicated they would most likely choose chicken or poultry when eating away from home. Twelve of these changed when responding to the posttest indicating poultry or chicken would no longer be their most likely choice when eating at a restaurant. A similar trend was found for fish where nine of the 17 respondents who had indicated fish to be their most likely choice on the pretest changed on the posttest indicating fish was not their most likely choice when eating at a restaurant. There was not enough change between pre- and posttest scores pork or nonmeat meals to apply chi-square analysis. In general neither were chosen either before or after the videoconference.

TABLE 15  
ITEMS MOST LIKELY TO BE ORDERED  
AT A RESTAURANT (TOTAL=78)

Product	<u>Change Between Pretest and Posttest</u>				Chi Square	p
	No-no N	No-to-yes N	Yes-to-no N	Yes-Yes N		
Beef	11	11	3	53	11.70*	<.005+
Pork	75	0	2	1	**	--
Chicken	41	7	12	18	17.49	.000+
Fish	49	12	9	8	2.92	>.05
Nonmeat meal	73	3	2	0	**	--

TABLE 15 (continued)

\*Adjusted chi-square used when 25% of the cells had expected counts less than 5.

\*\*More than 25% of the chi-square cells had expected counts less than 5. Chi-square is not a valid test.

+Significant at the  $p < .05$  level.

Examination of pretest scores to posttest fast food restaurant scores indicate beef was the most likely entree both before and after the videoconference (Table 16). Ninety-one percent of those who responded beef would not be their most likely choice on the pretest reported it would be their most likely choice for a fast food restaurant entree on the posttest. Of those who indicated chicken or poultry would be their most likely entree choice on the pretest, two-thirds reported on the posttest it would not. A significant number of respondents (10 of 17) who initially chose fish as the entree indicated on the posttest fish would not be their most likely choice at a fast food restaurant (adjusted chi-square,  $p < .05$ ). Pork and nonmeat meals were not likely to be chosen either before or after the videoconference.

TABLE 16  
ITEMS MOST LIKELY TO BE ORDERED AT A  
FAST FOOD RESTAURANT (TOTAL=78)

Product	Change Between Pre- and Posttest				Chi Square	p
	No-no N	No-to-yes N	Yes-to-no N	Yes-yes N		
Beef	2	20	10	46	.488*	>.5
Pork	75	0	3	0	**	--
Chicken	39	9	20	10	2.131	=.14
Fish	56	6	10	7	4.37*	<.05
+ Nonmeat meal	76	0	2	0	**	--

\*Adjusted chi-squares used when 25% of the cells had expected counts less than 5.

\*\*More than 25% of the chi-square cells had expected counts less than 5. Chi-square is not a valid test.

+Significant at the  $p < .05$  level.

Respondents were asked on the pre- and posttests to estimate the amount of money they spent in a typical week for beef, chicken, pork and fish based on categories of \$0-4.99, \$5-9.99, \$10-14.99 and \$15 or more. Chi-square analysis indicated a large number of expected frequency cells had values less than five so data was collapsed in two categories of \$0-9.99 and \$10 or more. A third category was added for respondents who indicated they slaughtered their own animals. One respondent indicated they slaughtered their own beef prior to the videoconference, ten indicated they used home slaughtered beef afterward. No one reported killing their own chicken, pork or fish on the pretest. On the posttest one

respondent indicated for each chicken and pork that they killed their own animals and two indicated they caught their own fish. Examination of results showed over 50% of expected cell chi-square values were over five indicating chi-square was not a valid test. Frequency rates for dollars spent per week in each of the two categories show little change in spending patterns (Table 17). In general those who originally spent \$0-9.99 per week on either beef, chicken, pork or fish continued to spend that amount after the videoconference. Those who indicated on the pretest that they spent \$10 or more per week at the grocery on either of the foods were more likely to have made a change in spending but in all cases the number of pretest respondents to this category was small. Hence while the percentage of respondents who reduced grocery spending appeared large (over 40% for all but fish for which no one spent \$10 or more either before or after the program) actual numbers of respondents who changed was small.

TABLE 17

FREQUENCY RESPONSE RATES FOR DOLLARS  
SPENT PER WEEK AT THE GROCERY STORE

Amount Spent	Animal	Total	No Change		Change	
			N	%	N	%
\$0-9.99	Beef	55	40	73	7 increased	13
	Chicken	72	68	94	3 increased	4
	Pork	75	72	96	2 increased	3
	Fish	74	68	92	4 increased	5

TABLE 17 (continued)

\$10+	Beef	20	11	55	8 decreased	40
	Chicken	4	2	50	2 decreased	50
	Pork	1	1	100	0 changed	0
	Fish	2	1	50	2 decreased	50

To investigate where respondents acquired their nutrition information a question was included on the pretest which asked the extent of use of 14 possible information sources. Respondents were to indicate if each source was "much used," "provided some" nutrition information, or was "not used". Labels on products received the highest frequency rating (N=73 or 52.1%) for "much used" information sources followed by books on health, cooking, or diet (N=63 or 45.0%) (Table 18). When the "much used" and "provides some" information categories were combined the most commonly used sources of nutrition information were product labels and newspapers (N=110 or 78.6% for each), books on health, cooking, or diet (N=109 or 77.9%), television (N=103 or 73.5%), family (N=86 or 61.5%), friends (N=80 or 57.2%), and health magazines (N=70 or 50%). Possible information sources which were least used by respondents included health club personnel (N=134 or 95.7%), weight loss clinics (N=120 or 85.7%), food store personnel (N=118 or 84.3%), school teachers (N=112 or 80.0%), dietitians (N=85 or 60.7%), physicians or nurses (N=83 or 59.3%) and radio (N=83 or 59.3%). Respondents also indicated other "much used" nutrition information

sources were the Cooperative Extension Service (N=6 or 4.3%), professional journals (N=3 or 2.1%), previous knowledge, seminars, and college course work (N=1 per response).

TABLE 18  
FREQUENCY OF USE OF AVAILABLE REFERENCES  
AS SOURCES OF NUTRITION INFORMATION  
BY BEEF VIDEOMEETING PRETEST  
RESPONDENTS (TOTAL=140)

Source	Much Used		Provided Some		Not Used	
	N	%	N	%	N	%
Health magazines	19	13.6	51	36.4	70	50.0
Newspapers	36	23.6	77	55.0	30	21.4
Television	31	22.1	72	51.4	37	26.4
Radio	10	7.1	47	33.6	83	59.3
Family	32	22.9	54	38.6	54	38.6
Friends	26	18.6	54	38.6	60	42.9
Physician or nurse	16	11.4	41	29.3	83	59.3
Dietitian	37	26.4	18	12.9	85	60.7
School teacher	9	6.4	19	13.6	112	80.0
Books on health, cooking or diet	63	45.0	46	32.9	31	22.1
Labels on products	73	52.1	37	26.4	30	21.4
Health club personnel	0	0	6	4.3	134	95.7
Weight loss clinic	10	7.1	10	7.1	120	85.7
Food store personnel	3	2.1	19	13.6	118	84.3

Taste, nutrition, price and convenience were surveyed as factors in beef purchasing decisions. Taste was most frequently rated as very important both before (N=70) and after (N=65) the videoconference (Table 19). There was not enough change between pre- and posttest scores for chi-square analysis to be applied. Of the ten respondents who



indicated taste held only some importance or was not a factor in their beef purchasing decisions, nine rated it as very important after the videoconference. Significant changes at the  $p=.027$  level were observed for the category of the importance of nutrition. Eighteen percent of pretest respondents who had reported nutrition was a very important factor indicated on the posttest that it was only of some importance or not a factor in beef purchasing decisions. Respondents who reported a reduction in the importance of nutrition may have learned during the videoconference that beef compared positively with other animal protein foods in total fat, saturated fatty acid, cholesterol, and calorie content and thus placed less emphasis on these particular nutrients from a negative standpoint when purchasing beef. Six (43%) of the fourteen pretest respondents who had reported nutrition was of some importance or not a factor felt it was a very important factor after the videoconference. It is possible that those who had originally held a negative impression about the nutritional contributions of beef to the diet learned positive information during the videoconference so that the nutritional importance of beef was enhanced. Significant changes at the  $p<.000$  level were observed for the importance of price in beef purchases. Eighteen percent ( $N=50$ ) of those who reported price was very important in purchasing decisions on the pretest indicated it was only of some importance or not a factor on the posttest.

Conversely 37% (N=40) of those who reported price was of only some importance or not a factor on the pretest indicated it was very important after the videoconference. Significant changes at the  $p < .001$  level were observed for the importance of convenience in beef purchase decisions before and after the videoconference. Prior to the program 36 respondents indicated convenience was very important in the decision process while 44 indicated it was only of some importance or was not a factor. Following the videoconference, 28% (N=10) of those who originally reported convenience was very important indicated it was now of only some importance or not a factor. Thirty-six percent (N=16) of those who reported it to be of less importance on the pretest felt it to be very important on the posttest.

TABLE 19  
PERCEIVED IMPORTANCE OF FOUR FACTORS IN  
BEEF PURCHASE DECISIONS (TOTAL=80)

Factor	Chi-square Frequency Response				p
	Very- Very- N	Very-to- Some N	Some-to- Very N	Some- Some N	
Taste	65	5	9	1	$p > .9^*$
Nutrition	54	12	6	8	$p = .027^{*+}$
Price	41	9	11	19	$p < .000^+$
Convenience	26	10	16	28	$p < .001^+$

\*Based on an adjusted chi-square value.

+Significant at the  $p < .05$  level.

As a final question participants were asked how the availability of eight factors would influence the amount of beef they bought. For every factor except brand named beef at least 50% of respondents who originally indicated availability would not result in increased beef purchases indicated on the posttest that it would do so (Table 20). At the same time for every category, over 60% of those who indicated on the pretest that specific factors would positively impact the amount of beef purchased indicated on the posttest that availability of these factors would not increase beef purchases. In general there were greater numbers of respondents who changed from "yes the factor would increase beef purchases" to "no it would not" than from "no it would not" to "yes it would." The exception to this trend was "better trimmed, leaner beef" where a larger number of respondents (N=36) indicated a change from no-to-yes than from yes-to-no (N=23) after viewing the videoconference. It is possible that such large numbers of respondents changed from desiring the factors to not desiring them because they learned during the videoconference that:

- \*beef is a low calorie food if prepared by methods which do not add fat

- \*selection of quality beef which reduced the need for the assurance that brand name products could provide

- \*that many beef cuts could be cooked quickly by conventional cooking methods

\*cutting techniques and proper storage of larger cuts which minimized the need for smaller packages

\*many beef cuts were already being marketed without bones

\*that high quality frozen beef entrees were available in supermarket freezer sections.

Irradiation of beef was not discussed during the program so the changes from "yes-to-no" cannot be attributed to information provided. Even though it was pointed out during the videoconference that beef is being better trimmed before being marketed, consumers appear to desire the availability of even leaner beef. Seven respondents indicated they would buy more often if it were lower in price, three if it was more tender, one if no red food coloring was added and one if more low calorie recipes for beef were available.

TABLE 20

IMPORTANCE OF EIGHT FACTORS IN BEEF  
PURCHASE DECISIONS (TOTAL=80)

Factor	<u>Frequency Response (Pre-Post)</u>								
	no-no			no-yes		yes-no		yes-yes	
	N	N	%	N	%	N	%	chi-square	p
	change			change		change			
Lower calorie cuts	9	23	72	36	75	12		17.14	.000+
Brand named	3	0	0	69	96	8		**	--
Microwavable, precooked	4	9	69	50	75	17		9.55*	.025+

TABLE 20 (continued)

Smaller packages	7	17	71	45	80	11	19.35	.000+
Better trimmed, leaner	7	36	84	23	62	14	17.86	.000+
Boneless	11	15	58	44	82	10	12.54	.000+
Irradiated	1	1	50	76	97	2	**	--
Better tasting frozen entrees	4	5	56	52	73	19	1.59	>.1

\*Adjusted chi-squares used when 25% of the cells had expected counts less than 5.

\*\*More than 25% of the chi-square cells had expected counts less than 5. Chi-square is not a valid test.

+Significant at the  $p < .05$  level.

### Testing of Hypotheses

Hypothesis 1: There will be no difference in knowledge, attitude or behavior regarding beef associated with the selected demographic variables of education, male or female heads of household employment status, household income or type of community in which the subject lives.

When considering nutrition knowledge of beef the researcher failed to reject Hypothesis 1 because there were no significant differences ( $p < .05$ ) in nutrition knowledge among the selected demographic variables. When considering attitude toward and use of beef the researcher rejected Hypothesis 1. Significant differences ( $p < .05$ ) in attitude were found as a result of employment status of the male and female head of household and household income. Significant differences ( $p < .05$ ) in buying practices were found among classifications for community size; in preparation methods

among classifications for employment status of the male and female head of household; and in the frequency of beef consumption among classifications for employment status of the female head of household (Tables 4, 5, 6, 7 and 8).

Hypothesis 2: There will be no significant change in knowledge of beef in those attending the videoconference.

There was inadequate data to reject or fail to reject Hypothesis 2. Trends did indicate an increase in knowledge of the nutritional contributions of beef. When compared to the pretest, a larger number of posttest respondents agreed with the statements that beef is low in calories, in fat and cholesterol, high in iron, wholesome and a good protein source (Table 9).

Hypothesis 3: There will be no significant change in attitude toward beef resulting from information presented on the program.

There was inadequate data to reject or fail to reject Hypothesis 3. Trends indicated an improved attitude toward beef. When compared to the pretest, a larger number of posttest respondents disagreed with the statements that beef is hard to cook, time consuming to cook, does not taste good and is less nutritious than fish. A larger number agreed with the statements that beef is needed for good health, satisfying liked by all, versatile, liked by children and more nutritious than chicken (Table 9).

Hypothesis 4: Beef purchasing and/or use practices will not significantly change after viewing the program.

When considering buying practices the researcher rejected Hypothesis 4 (Tables 17, 19 and 20). A larger number of posttest respondents perceived taste, price and convenience to be important in beef purchase decisions. A larger number would buy more beef if factors such as lower calorie cuts, microwavable or precooked cuts, smaller packages and/or better trimmed beef were available.

When considering preparation and eating practices the researcher rejected Hypothesis 4. There was a significant ( $p < .05$ ) increase in the number of respondents who trimmed fat before cooking and a significant decrease in the number who ate the fat after viewing the program. Trends indicated that a larger number of posttest than pretest respondents frequently chose beef preparation methods which did not add fat and reduced preparation time.

When considering the frequency of beef consumption the researcher rejected Hypothesis 4. In general, a wider variety of beef products were likely to be eaten in a typical week after than before the videoconference (Table 14). Respondents were more likely to order beef when dining away from home after the program (Table 15 and 16).

## CHAPTER V

### SUMMARY, RECOMMENDATIONS AND IMPLICATIONS

This study examined the effects of the satellite videoconference "Eating Healthy--A Guide for Active Living" on viewers' knowledge, attitudes and behavior toward beef. The review of literature revealed that changing socio-demographic trends such as decreased household size, increased numbers of single-female-parent households, increased numbers of working women, an increased average age of the United States population and an increased interest in health affect the amount of beef consumed and the importance of factors such as convenience, price and nutrition when meat decisions are made. The review included an discussion of nutrition factors of concern to consumers such as the fat, saturated fat and cholesterol content of beef, the role of beef in a weight control diet and other key nutrients provided by beef including protein, zinc, and B-vitamins. Also included was a review of other studies of consumer market research in which the attitudes, perceptions, frequency of use, preparation and eating habits and nutrition knowledge and concerns of consumers about beef were examined. Results of this study will be used to indicate whether a videoconference can change



consumer knowledge, attitudes or behavior toward beef when used alone or if it should be included as part of a comprehensive learning program.

A total of 143 pretest questionnaires were collected from participants at designated downlink sites. One-hundred-twenty-nine respondents completed the section on name and address and were mailed posttest questionnaires about one month after the program. Eighty-one were completed and returned.

#### Summary

The majority of respondents were female, 35 years of age or older, had at least some college education, were from one or two person families, were married with no children living at home, had household incomes of \$25,000 or more and held the primary responsibility for beef purchasing and preparation for the household. Almost half of the female and over half of the male respondents were employed at least part of the time outside the home. Half were from cities with populations below 25,000 or from rural areas. There were no significant differences found in knowledge, attitudes or behavior toward beef between education categories but differences were found between categories for male and female head of household employment status, household income, and community size.

There were no significant changes in knowledge of or attitudes toward beef in those responding to the posttest

but trends indicated the videoconference increased participants knowledge of the nutritional contributions of beef to the diet and may have enhanced the image of beef when compared to other animal protein foods. There were significant differences between the pre- and posttest responses for beef purchasing and/or use. While the money spent at the grocery store per week did not change as a result of the program, a significant number indicated nutrition, price and convenience increased in importance when beef purchase decisions were made. Examination of cooking methods most used to prepare beef indicated viewers significantly reduced the use of methods which added fat during cooking, such as frying, and increased use of methods which did not add fat and which kept preparation time short, such as broiling and grilling. There were also significant changes in the frequency of beef consumption and likelihood of selecting beef when eating away from home. A significant number of respondents who had originally indicated that in a typical week they did not eat beef steak, roast, processed beef, liver or frozen beef entrees indicated on the posttest that these foods were included. Fifty percent of those who responded that beef would not be their first choice when eating away from home indicated on the post test that it would be when eating at a restaurant. Ninety-one percent changed to indicated it would be their first choice when eating at a fast food restaurant.

## Recommendations

It is recommended that future videoconferences be shorter in length, preferably one hour rather than two. In order to share the same amount of information there should be a series of programs. Suggested topics for future programming on beef are preparation techniques including the use of the microwave oven and safety questions involved in the use of growth promotants and antibiotics in beef production. To enhance the effectiveness of the videoconference format future programs should be part of a broad educational program or learning experience which could include written materials such as those provided to "Eating Healthy--A Guide for Active Living" viewers plus on-site activities before and after air-time such as local experts to answer questions and present demonstrations of products prepared using principles discussed during the program. The researcher also recommends that a sequence of similar programs be developed on other meats including pork, chicken and poultry, fish and seafood, vegetables, and fruits. This and future videoconferences should be broken into 15 to 20 minute segments after the original airing which could then be utilized by county home economists, dietitians or teachers for lunch-and-learn sessions, to explain specific principles, and/or to stimulate discussion. Scripts should be developed for adult and youth audiences. It is also recommended that copies of videoconferences be made available to the general

public for home use via checkout at Cooperative Extension Service county offices, public libraries, or movie rental shops.

The researcher recommends that further study be done on the effectiveness of the videoconference format with different ethnic groups such as blacks, Mexican-Americans, Southeast Asian refugee families, and Native American Indian populations. Additional study is also recommended on the effectiveness of the program format when used to teach low-income groups such as participants in the Expanded Food and Nutrition Education Program (EFNEP) and the Women, Infant, and Childcare Program (WIC). Additional study could also be made of alternative uses for shortened versions of "Eating Healthy--A Guide for Active Living" such as effectiveness when played on a continuous loop tape in doctors' offices, at meat counters or above checkout counters in a supermarket.

### Implications

The researcher believes that the satellite videoconference is an effective teaching method that can be used to reach a wide audience and to provide that audience with the expertise and knowledge of professionals who would otherwise be unavailable due to time and dollar constraints. The results of this study have demonstrated that behavioral change can be accomplished via this programming format, however to assure sustained change in

eating patterns there should be continued contact with viewers after the program is originally aired. This could best be accomplished through coordinated efforts of the beef industry, governmental agencies, and educational institutions at all grade levels.

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## APPENDIXES

APPENDIX A

PRETEST QUESTIONNAIRE

## COOPERATIVE EXTENSION SERVICE

OKLAHOMA STATE UNIVERSITY  
HOME ECONOMICS PROGRAMS  
413 Home Economics West



COLLEGE OF HOME ECONOMICS  
STILLWATER, OKLAHOMA 74078  
Tel: 405-624-6824

March 06, 1986

Dear Friend:

Thank you for coming to "Eating Healthy-A Guide for Active Living" which is a satellite videoconference about how beef fits into your diet. We hope you will enjoy this new kind of program and learn something too.

Because this is a new way to share information, those of us at the Cooperative Extension Service would like your help in determining the program's effectiveness. Would you take a few minutes before air time to complete the questionnaire in the envelope? The information will be kept confidential but we are asking you to include your name and address so a follow-up questionnaire can be sent to some of you in about a month. This will give us information about the effectiveness of the program.

Please fill out the questionnaire before the program begins. The site coordinator will collect them before it starts so you can give full attention to what is happening on the screen.

Thank you for your help.

Sincerely,

*Barbara J. Brown*

Barbara Brown, M.S., R.D.  
Food Specialist



## QUESTIONNAIRE

### SECTION 1

Put a check in the blank beside the most correct answer for you.

1. What is your sex?
  - a. ☐ Male
  - b. ☐ Female
2. What is your age?
  - a. ☐ Less than 18
  - b. ☐ 18 - 24
  - c. ☐ 25 - 34
  - d. ☐ 35 - 49
  - e. ☐ 50 - 64
  - f. ☐ Over 64
3. How much education have you had?
  - a. ☐ Less than high school graduate
  - b. ☐ High school graduate
  - c. ☐ Some college
  - d. ☐ College graduate/post graduate
4. How many people live in your household?
  - a. ☐ 1 person
  - b. ☐ 2 people
  - c. ☐ 3 - 4 people
  - d. ☐ 5 or more people
5. What is your marital status?
  - a. ☐ Married
  - b. ☐ Single/never married
  - c. ☐ Widowed/divorced/separated
6. Do you have children under 18 living in your household?
  - a. ☐ Yes
  - b. ☐ No
- 6.5. If Yes, what are their ages and sexes?
 

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7. What is your occupation? \_\_\_\_\_
- 7.5. If married, what is your spouse's occupation? \_\_\_\_\_
8. What is the employment status of the male head of house?
- a. \_\_\_\_\_ Employed fulltime outside of the home
  - b. \_\_\_\_\_ Employed part-time outside of the home
  - c. \_\_\_\_\_ Unemployed outside of the home
  - d. \_\_\_\_\_ No male head
- 8.5. What is the employment status of the female head of house?
- a. \_\_\_\_\_ Employed fulltime outside of the home
  - b. \_\_\_\_\_ Employed part-time outside of the home
  - c. \_\_\_\_\_ Unemployed outside of the home
  - d. \_\_\_\_\_ No female head
9. What is your household income per year?
- a. \_\_\_\_\_ Less than \$10,000
  - b. \_\_\_\_\_ \$10,000 - \$14,999
  - c. \_\_\_\_\_ \$15,000 - \$24,999
  - d. \_\_\_\_\_ \$25,000 - \$39,000
  - e. \_\_\_\_\_ \$40,000 or more
10. In which type community do you live?
- a. \_\_\_\_\_ Large city (over 250,000 people)
  - b. \_\_\_\_\_ Small city (25,000 to 250,000 people)
  - c. \_\_\_\_\_ Town (under 25,000 people)
  - d. \_\_\_\_\_ Rural
11. In general, who has the primary responsibility for food purchasing in your home?
- a. \_\_\_\_\_ Self
  - b. \_\_\_\_\_ Spouse or housemate
  - c. \_\_\_\_\_ Your parent
  - d. \_\_\_\_\_ Child
  - e. \_\_\_\_\_ Shared
- 11.5. If shared, who do you share with and how often?
- \_\_\_\_\_

12. In general, who has the primary responsibility for cooking in your home?

- a. \_\_\_\_\_ Self
- b. \_\_\_\_\_ Spouse or housemate
- c. \_\_\_\_\_ Parent
- d. \_\_\_\_\_ Child
- e. \_\_\_\_\_ Shared

12.5. If shared, who do you share with and how often?

---

## SECTION 2

For the questions in this section circle the number which tells how strongly you agree or disagree with each statement. The number 1 equals strongest agreement and the number 5 equals the least agreement.

1. In general, when you think of beef as a food, do you consider it to be:

- |                            |   |   |   |   |   |
|----------------------------|---|---|---|---|---|
| a. High cost               | 1 | 2 | 3 | 4 | 5 |
| b. Hard to cook            | 1 | 2 | 3 | 4 | 5 |
| c. High calorie            | 1 | 2 | 3 | 4 | 5 |
| d. A good nutrition choice | 1 | 2 | 3 | 4 | 5 |
| e. Needed for good health  | 1 | 2 | 3 | 4 | 5 |
| f. Heavy                   | 1 | 2 | 3 | 4 | 5 |
| g. A good food buy         | 1 | 2 | 3 | 4 | 5 |
| h. Time consuming to cook  | 1 | 2 | 3 | 4 | 5 |

2. How strongly do you agree with these statements about beef?  
(1=strongest agreement; 5=least agreement)

- |                              |   |   |   |   |   |
|------------------------------|---|---|---|---|---|
| a. I don't like beef         | 1 | 2 | 3 | 4 | 5 |
| b. Beef is satisfying        | 1 | 2 | 3 | 4 | 5 |
| c. Beef is liked by everyone | 1 | 2 | 3 | 4 | 5 |
| d. Beef does not taste good  | 1 | 2 | 3 | 4 | 5 |
| e. It is versatile           | 1 | 2 | 3 | 4 | 5 |
| f. Children like beef        | 1 | 2 | 3 | 4 | 5 |

3. In general, when you think about beef, do you consider it to be (1=strongest agreement, 5=least agreement):

a. High in fat	1	2	3	4	5
b. Low in cholesterol	1	2	3	4	5
c. Wholesome	1	2	3	4	5
d. More nutritious than chicken	1	2	3	4	5
e. Less nutritious than fish	1	2	3	4	5
f. High in iron	1	2	3	4	5
g. Low in sodium	1	2	3	4	5
h. A good protein source	1	2	3	4	5
i. A food that gives strength	1	2	3	4	5

4. Compared to 2 years ago, do you (1=strongest agreement, 5=least agreement):

a. Serve fewer light meals	1	2	3	4	5
b. Eat out more often	1	2	3	4	5
c. Skip breakfast less often	1	2	3	4	5
d. Eat more cold main dishes	1	2	3	4	5
e. Serve larger meat portions	1	2	3	4	5
f. Eat more frozen entrees or dinners	1	2	3	4	5
g. Eat beef less often	1	2	3	4	5

### SECTION 3

1. Put a check under the column which gives the number of times you ate each of the following last week.

	Never	1-4	5-11	12 or more
a. Fresh beef	—	—	—	—
b. Ground beef	—	—	—	—
c. Chicken	—	—	—	—
d. Pork	—	—	—	—
e. Fish	—	—	—	—

2. When preparing and eating beef do you or the person who usually cooks for you:

- \_\_\_\_\_ Trim fat before eating
- \_\_\_\_\_ Trim or drain fat after cooking
- \_\_\_\_\_ Eat the fat

3. Circle the number after each cooking method which indicates how often you or the person who cooks for you use it to cook beef. (1 is the most often used method and 5 is the least used method)
- |                         |   |   |   |   |   |
|-------------------------|---|---|---|---|---|
| a. Roasting             | 1 | 2 | 3 | 4 | 5 |
| b. Stewing or braising  | 1 | 2 | 3 | 4 | 5 |
| c. Broiling or grilling | 1 | 2 | 3 | 4 | 5 |
| d. Frying               | 1 | 2 | 3 | 4 | 5 |
| e. Stir frying          | 1 | 2 | 3 | 4 | 5 |
| f. Microwaving          | 1 | 2 | 3 | 4 | 5 |
4. Which of the following have had an impact on the amount of beef you eat? (Check all that apply):
- ☐ Health concerns
  - ☐ Fat content of beef
  - ☐ Cholesterol content of beef
  - ☐ Sodium content of beef
  - ☐ Iron content of beef
  - ☐ B-vitamin content of beef
  - ☐ Ease of preparation
  - ☐ Lack of preparation skills
  - ☐ Lack of preparation facilities or equipment
  - ☐ Cost of beef
  - ☐ Cost of poultry, fish, or other meats
  - ☐ Caloric content
  - ☐ Additives, growth promotants
  - ☐ Availability of alternative protein foods
  - ☐ None of these
5. Where is most of the beef you eat at home purchased?
- ☐ Supermarket
  - ☐ Meat market
  - ☐ Deli
  - ☐ Restaurant
  - ☐ Special distributor sales at motels, service stations, or department stores
  - ☐ Direct from rancher
  - ☐ Slaughtered family owned animal
  - ☐ Do not know



6. In a typical week, how often do you eat each of the following beef items at home?

	Never	1-2	3-4	5 or more
a. Steak	—	—	—	—
b. Ground beef	—	—	—	—
c. Roast	—	—	—	—
d. Processed beef	—	—	—	—
e. Liver	—	—	—	—
f. Frozen entrees	—	—	—	—
g. Canned beef	—	—	—	—
h. Other	—	—	—	—

7. Put a check by the item you are most likely to order when you eat at a restaurant or fast food restaurant.

- a. ☐ Beef  
 b. ☐ Pork  
 c. ☐ Chicken or poultry  
 d. ☐ Fish  
 e. ☐ A nonmeat meal

8. Put a check under the column which shows how much you spend at the grocery store for each of these meats in an average week.

	\$0-4.99	\$5-9.99	\$10-14.99	\$15 or more
a. Beef	—	—	—	—
b. Chicken	—	—	—	—
c. Pork	—	—	—	—
d. Fish	—	—	—	—

9. Put a check in the column which tells how often you use each of the following sources of nutrition information:

	much used	provides some	not used
a. Health magazines	___	___	___
b. Newspapers	___	___	___
c. Television	___	___	___
d. Radio	___	___	___
e. Family	___	___	___
f. Friends	___	___	___
g. Physician or nurse	___	___	___
h. Dietitian	___	___	___
i. School teacher	___	___	___
j. Books on health, cooking, or diet	___	___	___
k. Labels on products	___	___	___
l. Health club personnel	___	___	___
m. Weight loss clinic	___	___	___
n. Food store personnel	___	___	___
o. Other _____	___	___	___

10. Put a check under the column which tells the importance of each of the following factors in your beef purchasing decisions:

	very important	some importance	not a factor
a. Taste	___	___	___
b. Nutrition	___	___	___
c. Price	___	___	___
d. Convenience	___	___	___

#### SECTION 4

I would buy beef more often if I could find (check all that apply):

- a. \_\_\_\_\_ Lower calorie cuts
- b. \_\_\_\_\_ Brand named beef
- c. \_\_\_\_\_ Microwavable precooked beef
- d. \_\_\_\_\_ Smaller packages
- e. \_\_\_\_\_ Better trimmed, leaner beef
- f. \_\_\_\_\_ Boneless beef
- g. \_\_\_\_\_ Irradiated beef
- h. \_\_\_\_\_ Better tasting frozen beef entrees
- i. \_\_\_\_\_ Other \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

(city)

(state)

(zip)



## APPENDIX B

### POSTTEST QUESTIONNAIRE

## QUESTIONNAIRE

### SECTION 1

For the questions in this section circle the number which tells how strongly you agree or disagree with each statement. The number 5 indicates strongest agreement and the number 1 indicates the least agreement.

1. In general, when you think about beef, do you consider it to be (5=strongest agreement, 1=least agreement):

a. High in fat	1	2	3	4	5
b. Low in cholesterol	1	2	3	4	5
c. Wholesome	1	2	3	4	5
d. More nutritious than chicken	1	2	3	4	5
e. Less nutritious than fish	1	2	3	4	5
f. High in iron	1	2	3	4	5
g. Low in sodium	1	2	3	4	5
h. A good protein source	1	2	3	4	5
i. A food that gives strength	1	2	3	4	5

2. How strongly do you agree with these statements about beef? (5=strongest agreement; 1=least agreement)

a. I don't like beef	1	2	3	4	5
b. Beef is satisfying	1	2	3	4	5
c. Beef is liked by everyone	1	2	3	4	5
d. Beef does not taste good	1	2	3	4	5
e. Beef is versatile	1	2	3	4	5
f. Children like beef	1	2	3	4	5

3. In general, when you think of beef as a food, do you consider it to be: (5=strongest agreement; 1=least agreement)

a. High cost	1	2	3	4	5
b. Hard to cook	1	2	3	4	5
c. High calorie	1	2	3	4	5
d. A good nutrition choice	1	2	3	4	5
e. Needed for good health	1	2	3	4	5
f. Heavy	1	2	3	4	5
g. A good food buy	1	2	3	4	5
h. Time consuming to cook	1	2	3	4	5

4. Compared to before the videoconference, do you (5=strongest agreement, 1=least agreement):

a. Serve fewer light meals	1	2	3	4	5
b. Serve larger beef portions	1	2	3	4	5
c. Eat more frozen entrees or dinners	1	2	3	4	5
d. Eat beef less often	1	2	3	4	5

## SECTION 2

1. In a typical week, how often do you eat each of the following beef items at home?

	Never	1-2	3-4	5 or more
a. Steak	_____	_____	_____	_____
b. Ground beef	_____	_____	_____	_____
c. Roast	_____	_____	_____	_____
d. Processed beef, such as beef bologna or franks	_____	_____	_____	_____
e. Liver	_____	_____	_____	_____
f. Frozen entrees	_____	_____	_____	_____
g. Canned beef	_____	_____	_____	_____
h. Other	_____	_____	_____	_____

2. When you eat beef is the fat usually:

- a. \_\_\_\_\_ Trimmed before cooking  
 b. \_\_\_\_\_ Trimmed or drained after cooking  
 c. \_\_\_\_\_ Eaten

3. How have the following factors affected the amount of beef you eat?

	Positive Influence	No Influence	Negative Influence
a. Health concerns	_____	_____	_____
b. Fat content of beef	_____	_____	_____
c. Cholesterol content of beef	_____	_____	_____
d. Sodium content of beef	_____	_____	_____
e. Iron content of beef	_____	_____	_____
f. B-vitamin content of beef	_____	_____	_____
g. Ease of preparation	_____	_____	_____
h. Lack of preparation skills	_____	_____	_____
i. Lack of preparation facilities or equipment	_____	_____	_____
j. Cost of beef	_____	_____	_____
k. Cost of poultry, fish, or other meats	_____	_____	_____
l. Caloric content	_____	_____	_____
m. Additives, growth promotants	_____	_____	_____
n. Availability of alternative protein foods	_____	_____	_____
o. Eating Healthy-A Guide for Active Living Satellite Videoconference	_____	_____	_____

4. Since viewing the satellite videoconference, has the size of beef serving you usually eat:

- a. \_\_\_\_\_ Stayed the same  
 b. \_\_\_\_\_ Gotten smaller  
 c. \_\_\_\_\_ Gotten larger

5. Estimate the size of serving of beef you usually eat now:

- a. \_\_\_\_\_ Eat no beef  
 b. \_\_\_\_\_ 1-2 ounces  
 c. \_\_\_\_\_ 3-4 ounces  
 d. \_\_\_\_\_ 5-6 ounces  
 e. \_\_\_\_\_ Over 6 ounces

6. Put a check under the column which gives the number of times you ate each of the following last week:

	Never	1-4	5-11	12 or more
a. Fresh beef	_____	_____	_____	_____
b. Ground beef	_____	_____	_____	_____
c. Chicken	_____	_____	_____	_____
d. Pork	_____	_____	_____	_____
e. Fish	_____	_____	_____	_____

7. Circle the number after each cooking method which indicates how the beef you eat is cooked. (5 is the most often used method and 1 is the least used method)

a. Roasting	1	2	3	4	5
b. Stewing or braising	1	2	3	4	5
c. Broiling or grilling	1	2	3	4	5
d. Frying	1	2	3	4	5
e. Stir frying	1	2	3	4	5
f. Microwaving	1	2	3	4	5

8. Put a check under the column which shows how much you spend at the grocery store for each of these meats in an average week:

	\$0-4.99	\$5-9.99	\$10-14.99	\$15 or more
a. Beef	_____	_____	_____	_____
b. Chicken	_____	_____	_____	_____
c. Pork	_____	_____	_____	_____
d. Fish	_____	_____	_____	_____

9. Put a check by the item you are most likely to order when you eat at a restaurant or fast food restaurant.

Restaurant

Fast Food Restaurant

- a. \_\_\_\_\_ Beef  
b. \_\_\_\_\_ Pork  
c. \_\_\_\_\_ Chicken or poultry  
d. \_\_\_\_\_ Fish  
e. \_\_\_\_\_ A nonmeat meal

- a. \_\_\_\_\_ Beef  
b. \_\_\_\_\_ Pork  
c. \_\_\_\_\_ Chicken or poultry  
d. \_\_\_\_\_ Fish  
e. \_\_\_\_\_ A nonmeat meal

10. Put a check under the column which tells the importance of each of the following factors in your beef purchasing decisions:

	very important	some importance	not a factor
a. Taste	_____	_____	_____
b. Nutrition	_____	_____	_____
c. Price	_____	_____	_____
d. Convenience	_____	_____	_____

### SECTION 3

I would buy beef more often if I could find (check all that apply):

- a. \_\_\_\_\_ Lower calorie cuts  
b. \_\_\_\_\_ Brand named beef  
c. \_\_\_\_\_ Microwavable precooked beef  
d. \_\_\_\_\_ Smaller packages  
e. \_\_\_\_\_ Better trimmed, leaner beef  
f. \_\_\_\_\_ Boneless beef  
g. \_\_\_\_\_ Irradiated beef  
h. \_\_\_\_\_ Better tasting frozen beef entrees  
i. \_\_\_\_\_ Other \_\_\_\_\_

**THANK YOU!**



2  
VITA

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Research Assistant, Department of Food and  
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March, 1979, to June, 1979.  
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School Food Service Consultant, Oregon  
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American Dietetic Association, registered  
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Institute of Food Technologists and Oklahoma  
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