Working Paper WP93-7 November 1993

DESIRABLE ATTRIBUTES FOR VALUE ADDED MEAT PRODUCTS SURVEY - 1993

Jean Kinsey, Ben Senauer, and Yvonne Jonk

Center for International Food and Agricultural Policy

University of Minnesota
1994 Buford Avenue, 332 C.O.B.
St. Paul, Minnesota 55108-6040 U.S.A.

Phone: (612) 625-8713
Fax: (621) 625-6245

DESIRABLE ATTRIBUTES FOR VALUE ADDED MEAT PRODUCTS

SURVEY - 1993

Jean Kinsey,* Ben Senauer,* * and Yvonne Jonk* * *

University of Minnesota

November 1993

*Professor, Department of Agricultural and Applied Economics
**Professor, Department of Agricultural and Applied Economics and Director, Center for International Food and Agricultural Policy
***Ph.D. Student, Department of Agricultural and Applied Economics

This survey was supported by the Agricultural Utilization Research Institute of Minnesota and the Minnesota Beef Council.

Desirable Attributes for Value Addi:d Meat Products
Survey -1993

Project Report

Table of Contents

Table of Contents, continued

Topics **Page Number**

List **of** Tables **Page**

List of Figures **Page**

Desirable Attributes for Value Added Meat Products
Survey -1993

Executive Summary

Among the numerous findings from this survey a few stand out as particularly important.

*** Only 4** percent of households had increased beef consumption over the past year; 37 percent had decreased beef consumption. This is a smaller percent who changed in either direction than consumers responding to similar surveys in other U.S. cities.

* Seven percent of the households did not eat meat at all.

* Concerns about diet and health were significantly correlated with a decrease in beef consumption. Over 90% of those who decreased beef consumption were concerned about sodium, saturated fat, cholesterol and wanted to eat a variety of foods.

* Concerns about diet and health cut across age and educational groups.

* Concern about fat was greater among females and less among those whose household incomes were between $35,000 and $55,000 a year.

* Being concerned about excessive fat and cholesterol significantly increased the probability of decreasing the consumption of beef and eggs.

* Wanting excessive fat trimmed off meat products significantly increased the probability of increasing the consumption of poultry and fish.

* Households that earned over $50,000 a year were more likely to have decreased beef consumption.

* Almost all consumers wanted visible fat trimmed off beef products.

* Seventy-seven percent were willing to pay more for extra lean ground beef and 65% of that group were willing to pay between $.lO and $.49 more per pound.

* Fifty-nine percent were willing to pay more for beef that is free of antibiotics and growth hormones and 64% of that group were willing to pay between $.lO and $.49 more per pound.

* Almost half had tried a hamburger made with a fat substitute and two-thirds of them would try it again.

* Poultry and fish were substituting for red meats.

* Twin Cities households prepared an average of 3 full meals per week at home. They ate about 4 full meals a week away from home.

* There was a small, but insignificant, correlation between those who ate away from home more often and those who increased their beef consumption.

* Ground beef was served at home an average of 2.5 times a week; roasts or steak were served once every 3 weeks.

* Those who had decreased beef consumption spent more time preparing main meals.

* The most important characteristics of food were that it tastes good and is guaranteed safe to eat.

* The most important characteristics of meat were that it looks fresh, does not have a lot of waste, is certified as USDA inspected, and is free of chemical residues.

* Characteristics of meat that the majority of consumers agreed were important were: well trimmed fat, not treated with chemical preservatives, from animals not treated with hormones or antibiotics, from animals fed organic grains, and in biodegradable or recyclable packages.

* There was great concern about chemical residues and about the safety of new processes like irradiation and genetic engineering, but there were also many who confessed they just did not know what to think. Many educational opportunities exist in these areas.

* Being concerned about chemical residues significantly increased the probability of decreasing the consumption of all meats, beef, pork, poultry and fish.

* Less than one-fourth were concerned about humane treatment of animals for meat and only 16 percent worried about their environmental impact. Again, many did not know what to think about these issues.

* Nine market niches were identified based on attitudes and socioeconomic characteristics. The largest is the “Low Fat” niche comprising 58 percent of the sample. These are the people who said it is very important to avoid too much fat and saturated fat.

* The second largest niche was the “Safety” niche with 52 percent of the sample. These people said it is very important to buy food products that are guaranteed safe to eat and to buy meat that is certified as USDA inspected.

* The “Price Conscious” niche comprises 19 percent of the households. These people said it is very or somewhat important to find the lowest price per pound and they are not willing to pay extra for lean ground beef. Concern for low prices significantly explained the probability of increasing the consumption of poultry.

* Increasing income increased the probability that consumers will eat less beef and eggs.

* Increasing education increased the probability that consumers will eat less beef and fish and more eggs.

• Increasing age increased the probability that consumers will eat more fish and pork and fewer eggs.

Desirable Attributes for Value Added Meat Products
Survey -1993

Review of Project Objectives and Activities

Objectives

The purpose of this consumer survey was to learn more about consumer preferences for meat characteristics. Value added meat processors faced with the problem of trying to identify market niches wanted to know what types of consumers had similar preferences and what their specific preferences and concerns are. In addition, we wanted to learn more about attitudes that are believed to be changing due to new information about the relationship between diet and long term health, lifestyles that demand more convenient foods and less home cooking, the environmental impacts of cattle production, and social issues such as animal rights.

The sponsors and researchers agreed that:

a. Knowing consumers' attitudes about the relative importance of various meat attributes and how those attitudes influence consumers' decisions about the types and amounts of meat to eat will help meat producers and processors tailor their products to the market.

b. Knowing the profiles of people who hold these attitudes and their relative numbers in the market will help meat processors identify their market niche and allow them to make production adjustments accordingly.

c. Information that leads to improving products that fulfill the preferences of consumers will improve their satisfaction and well-being.

The objectives of the original project proposal are summarized here:

1. Identify which factors weigh most heavily in consumers' buying decisions.
2. Quantify the relative importance of meat attributes and the issues surrounding its production and consumption.
3. Identify some niche markets where smaller processors might provide products to a subset of consumers.
4. Identify opportunities for education about and promotion of meat products with specific attributes or treatments.

Activities

A Ph.D. graduate student (Yvonne Jonk) was hired to help design and implement a consumer survey instrument. After reviewing other mailed surveys and other studies that had used consumer surveys to learn about consumers' attitudes towards meat characteristics, food processes and safety (Menkhaus, 1988a; 1988b; 1990, 1992, 1993), and after consulting Dillman (1978) on survey design, we designed a set of questions to elicit the desired information from a random sample of consumers in the metropolitan area of Minneapolis and St. Paul, Minnesota. Drafts of the questionnaire were sent to Professors Dick Epley, Elaine Asp, and Paul Addis in the Food Science and Nutrition Department and Ben Senauer and Brian Buhr in the Department of Agricultural and Applied Economics at the University of Minnesota, John Lawrence in meat marketing in the Economics Department at the Iowa State University and Ron Eustus of the Minnesota Beef Council and William Stoll and Blain Breidenstein from the Agricultural Utilization Research Institute (AURI). A few small meat processors in Minnesota were

polled for input about what sort of things they most wanted to know. Suggestions from all these people were used in preparing a semi-final draft of the survey instrument.

This semi-final draft was taken to the Minnesota Center for Survey Research at the University of Minnesota. With their consultation and advice, a final questionnaire was prepared. On January 29, 1993, 800 questionnaires were mailed; 515 were returned for a 68% response rate. Details about the management of the survey and the raw data collected are in Technical Report #93-5 prepared by the project Manager, Steven W. Johnson of the Minnesota Survey Research Center. It is called *Meat Preferences Survey: Results and Technical Report* and dated April 2, 1993. The survey center actually conducted the survey, coded and tallied the results and presented us with computer disks of the data and paper copies of the above mentioned report.

Once we had the data, our first priority was to provide insight into the original issues and concerns as stated in the objectives. A pivotal question in our analysis was whether a household had increased, decreased or made no change in the consumption of beef and other animal food products over the past year. This proved to be interesting because it allowed us to link actual behavior with attitudes and household characteristics, demographics and expenditures. Answers to all other questions were cross tabulated with the answers to this question and checked for significant positive or negative relationships. Later, we used this response, which describes meat consumption behavior, as the variable to be explained by household characteristics, income, and attitudes. The statistical technique used is called “ordered probit analysis”. It estimates the probability that a given household will increase, decrease or not change their meat consumption

based on a common set of characteristics. It greatly refines the understanding of the relationships and allows one to predict the behavior of other consumers with similar characteristics.

Scope of this Paper

After a brief review of what we already knew, that is, the findings of other surveys and research on preferences for meat, a summary of our basic findings is presented. The results of the initial cross tabulation analysis is in the section called "Factors Affecting the Decrease of Beef Consumption in the Past Year". A ranking of consumers' concerns about food products and the cattle industry appear next. Information about cooking methods of meat and consumers' willingness to pay for lower fat beef is discussed before the section where we identify some market niches. Significant findings from the statistical analysis of the probability of increasing, decreasing and not changing beef, pork, fish, poultry and egg consumption appear at the end of this paper.

Prior Knowledge and Research

Much of the previous research on the effect of demographic factors and consumer attitudes on beef purchases has been conducted by Dale Menkhaus and his colleagues at the University of Wyoming. They carried out a consumer survey in 1987 in the San Francisco Bay Area as part of a study to assess the consumer response to branded, low fat, fresh beef. In Menkhaus, et al. (1990) they report on the basic results of this survey concerning the impact of consumer concerns and demographic factors on beef purchases. Out of the 310 people in the survey, 25 (8%) indicated they were eating beef more often over the previous year, 132 (43%) reported eating it less, and 151 (49%) the same amount. These changes in beef consumption are compared to another survey taken by Menkhaus, et.al. (1992) in Denver and Los Angeles in 1989 and to the results of this study in Minneapolis and St. Paul, Minnesota in 1993 in Table 1. In none of the

locations did more than 8% of consumers report increasing beef consumption and between 37% and 58% reported decreasing beef consumption.

Because of the small number who increased beef consumption Menkhaus and his coauthors focused on differences between those eating less beef and those making no change. In terms of roast consumption, those eating less were more concerned about high fat, cholesterol, salt, and calorie content, and they believed that eating too much was not good for health. The differences between those eating less and those with no change were statistically significant at the 10% level for these factors, based on a Chi-square test. Other factors that were significantly different between those eating less verses the same amount of steaks and hamburger were those eating less were more concerned about not being able to cook it in the microwave and containing artificial ingredients. Those eating less beef reported eating more chicken and fish. The only demographic factor that was significantly different between those eating less beef and the same, in the San Francisco study, was that those over age 45 were more likely to eat less beef.

In Menkhaus, et al. (1992) they used data from a survey of 362 consumers in Denver and 354 in Los Angeles collected in May and August of 1989 to study factors affecting the purchase of beef and other meats. An ordered probit technique was used to analyze those eating each type of meat less often, the same, or more often in the three years prior to the survey. A two-stage statistical estimation procedure was used because beef, poultry, pork, and fish are substitutes for each other and the amount purchased was treated as a set of simultaneous decisions.

Table 1 Percent of Consumers Who Reported Changes in Beef Consumption over a 1 to 3-Year Period Prior to the Survey – Four U.S. Cities, 1987 - 1993

City	Date of Survey	Sample Size	Increased Beef	Decreased Beef	No Change in Beef
			Percent		
Minneapolis/ St. Paul	1993	515	4	37	57
Denver and Los Angeles[1]	1989	716	7	58	35
San Francisco[2]	1987	310	8	43	49

[1]Menkhaus, et al, 1992
[2] Menkhaus, et al, 1990

The major consumer concerns which were related with a statistically significant probability of decreasing beef purchases were the fat trim, cuts being too large, cholesterol and calorie content, not being good for health, being too expensive and not tender enough. Among demographic factors, those with higher incomes were more likely to have decreased their beef use, whereas larger families were more likely to have increased their beef consumption. Both effects were statistically significant.

In Menkhaus, et al. (1993) the same data from the Denver and Los Angeles surveys were analyzed to identify the characteristics of beef which affect its perceived quality by consumers. Probit statistical analysis was also used here to explain the probability that consumers' perceived quality or overall opinion of fresh beef would be ranked fair or poor, good, very good or excellent. Factors that had a significant adverse effect on the perceived quality of beef were related to cholesterol and calorie content, artificial ingredients, convenience, its display, and its expense.

Capps, et al. (1988) used a survey of 200 shoppers in Houston to identify the demographic characteristics of consumers who had tried lean meat products. They also used probit as an analytical technique to explain the probability that a consumer had tried lean meats. Consumers were significantly more likely to have tried lean meat if they were age 40-59, had lived in Texas less than ten years, had attended college, and lived in a household with more members. In addition, the more conscious they were about fat in food the more likely they had purchased lean meat products.

Menkhaus, et al. (1988a) report on a laboratory test of the market for branded, low fat, fresh beef. The test was conducted in Sunnyvale in the San Francisco Bay Area in July, 1987 involving approximately 150 women shoppers. The product tested was "Wyoming Lean Beef." A 25% increase in price resulted in a 38% decrease in purchases during the experiment. Although the resistance to a price premium was substantial, there was a group of consumers who would pay more for a low fat beef product that was free of artificial ingredients.

Skaggs, et al. (1987) report on results from an earlier test marketing of "Wyoming Lean Beef' conducted in the San Francisco Bay Area in 1985. In this case the price per pound of the lean beef and the regular beef (control product) was the same. Over 60% of the participants purchased the lean beef, either solely or in addition to the control product. A 25% discount from the labeled price was offered on both products. Purchasers of the lean beef were more likely to be health oriented. After purchasing it, they rated the lean beef product high on its appetizing appearance, absence of gristle, trim, absence of waste, taste, and the fact that it was low in fat and cholesterol. A majority rated it much better than the beef they usually eat.

In Menkhaus, et al. (1988b), other aspects of the 1985 test marketing of lean beef are reported. They used logistic regression analysis methods to identify factors that affect the purchase and reordering of branded, low fat beef. Demographic factors did not have a significant effect on who purchased or reordered the lean beef. The probability of reordering the lean beef was affected by health related factors, in particular the closer trim and reduced fat content. The product's greater visual appeal was also important.

Pelzer, et al. (1991) report on the response of consumers to vacuum skin packaging for beef products. The information provided to consumers on vacuum sealed packaging was an important factor in their ranking of that packaging. However, consumers expressed concern about the color of beef in vacuum packages, especially among those who said the familiar bright red color of beef was important in their buying decisions.

Summary Of Basic Survey Findings

Changes in Meat Consumption

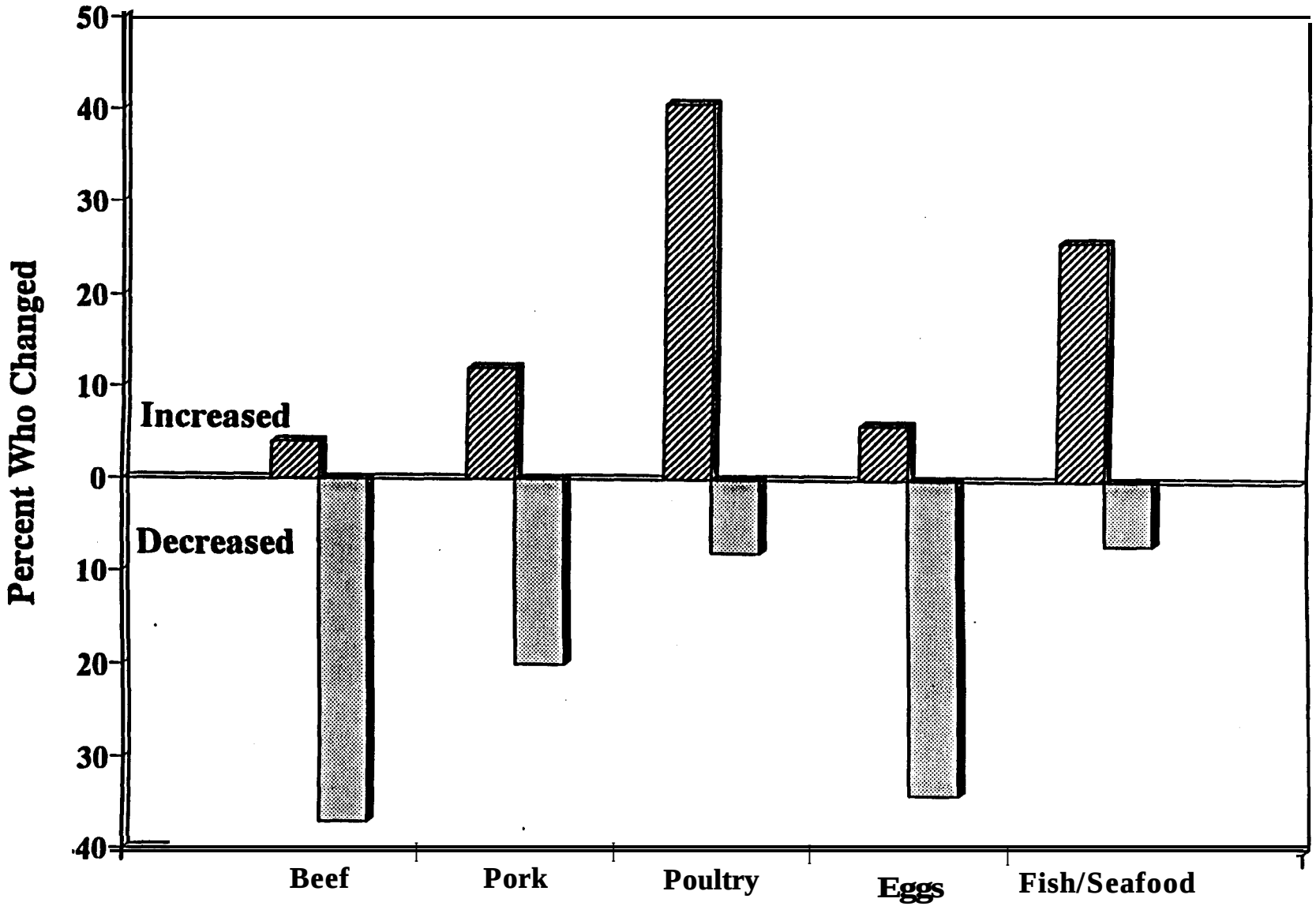
Question **4** asked whether the household increased, decreased or made no change in their consumption of meat, poultry, eggs, and seafood over the past year. The responses conform to the national pattern of decreasing beef consumption with pork consumption holding steady, poultry up substantially, egg consumption down significantly, and fish and seafood increasing. Thirty-seven percent reported a decrease in their household's use of beef in the last 12 months. Only 4% reported an increase and consumption remained the same for 57%. Pork use increased for 12%, decreased for 20%, and remained the same for 61%. Forty-one percent increased their poultry consumption and 26% their fish and seafood use. Egg use fell for 34% and increased for only 6% of the households. Figure 1 illustrates the percent of respondents who increased and decreased consumption of each of these foods. Seven percent of the households, after eliminating those that did not respond, had someone who did not eat meat. The reasons for not eating meat usually related to either health concerns or ethical issues. This percent is close to the 5% who report being vegetarians in the United States (Tufts, 1993).

Factors which help to explain these changes in eating patterns were estimated and are presented towards the end of this report. The most important explanatory factors tended to be attitudes about fat and cholesterol, chemical residues and convenience. Demographics played a significant role but the magnitude of the effect was less than for most attitudes.

Figure 1

Percent Who Increased and Decreased Consumption in the Past Year, 1993

University of Minnesota Study



Attitudes About Healthy Diets

Answers to question 1 indicated that 83% of the Twin Citians surveyed believed their diet is either good or very good.[1] Only 14% rated their diet as fair or poor and just 4% rated it excellent. Over 90% felt that avoiding too much sodium, fat, saturated fat, or cholesterol, plus eating a variety of foods and maintaining a desirable weight is either very or somewhat important.

Attitudes about diet and health which are positively and significantly correlated with a decrease in beef consumption are attitudes favorable to avoiding too much sodium, too much saturated fat, too much cholesterol, and wanting a variety of foods[2] Those who decreased their beef consumption in the past year were more likely to say that the four factors underlined above are very important. Even though it is considered very important to many consumers, avoiding too much fat, in general, is NOT significantly related to the decrease in beef consumption.

One might infer that consumers can differentiate between the importance of saturated fat and general fat in the diet. This would imply a high level of sophistication and education on this issue; consumers would know that beef contains saturated fat and cholesterol whereas lots of foods contain other types of fat. Almost all respondents (95%) prefer to have most visible fat trimmed off beef.

[1] The questionnaire is reproduced in Appendix A.

[2] In this report the statement that something is "significantly correlated with" or that it is "more likely or less likely" to occur, means that a statistical test (Chi Square test) was performed and the results showed a significant difference. Typically, it means that at least 95 of the time, the result could not have occurred by chance.

To gain some insight into the differences in opinions about diet and health between those who decreased their beef consumption and those who increased it, Table 2 shows the percent of those who decreased versus those who increased their beef consumption. With the exception of avoiding too much fat, all of these opinions were (statistically) significantly different for those who decreased beef consumption compared to those who did not.

Table 2 Opinion or Behavior Related to Diet and Health

Opinion/Preference Identified as Very Important	Percent of those who: decreased beef consumption	increased beef consumption
1. Avoid too much saturated fat.	**75**	12
2. Avoid too much fat.	**78**	37
3. Avoid too much cholesterol.	**65**	21
4. Avoid too much sodium.	**54**	21
5. Eat a variety of foods.	**73**	47
6. Their diet was very good or excellent.	**42**	21
7. Their diet was poor.	1	11
8. Increased their poultry consumption.	**68**	42
9. Decreased their egg consumption.	**54**	26
10. Increased their fish consumption.	**39**	22
11. Increased their pork consumption.	19	26

Poultry and fish appear to be substituting for beef among those who decreased beef consumption. This is born out by later statistical analysis reported in the section on "Statistical Analysis of Consumption Behavior." Among those who decreased beef consumption there is a high level of concern about a healthy diet in general. The results in Table 2 are consistent with findings in the San Francisco and the Los Angeles/Denver surveys where concern about health, fat, and cholesterol were associated with a decrease in beef consumption (Menkhaus et al., 1990; 1992).

When asked “how important is it to you personally” to do one of the following things related to diet and health, the most important answer was “avoid too much fat”. This is seen by looking at the average of the responses in Table 3 (omitting the “don’t know” answers which were generally trivial for this question). The second most important factor was eating a variety of foods followed by avoiding too much saturated fat, and maintaining a desirable weight. Consumers were least concerned with vitamins and minerals reflecting a general belief that American diets have an appropriate amount of the these micronutrients. Table 3 is divided into two sections - those factors for which the mean response was below 1.5 signifying that more than half of the respondents thought it was very important or somewhat important and those factors for which the mean responses were above 1.5 signifying that more than half of the respondents thought it was only somewhat important or not important.

Examining the demographics of these opinions shows that opinions about avoiding too much sodium, saturated fat, overall fat, and cholesterol were evenly distributed across age with a slight increase in the percent of those over age 65 thinking it was important to avoid too much sodium. Educational level was not significantly related to opinions about sodium or fat. Among those who had decreased beef consumption, those over age 35 were more likely to say it was important to eat a variety of foods.

Looking across all income groups, over 80% of those with incomes under $25,000 and over 70% of those with incomes over $100,000 thought it was very important to avoid too much fat compared to about two-thirds of the households in the income groups in between. Collapsing the income groups into three categories and testing for

Table 3 Diet and Health Attitudes in Order of Importance

Attitude	Mean Response
More than somewhat important	
Avoid too much fat	1.327
Eat a variety of foods	1.352
Avoid too much saturated fat	1.400
Maintain a desirable weight	1.422
Avoid too much cholesterol	1.530
Avoid too much salt or sodium	1.615
Avoid too much sugar	1.718
Less than somewhat important	
Eat at least two servings a day of meat poultry, fish, dry beans, eggs, and nuts	2.082
Take vitamins and/or mineral supplements	2.255
Avoid too much iron	2.515

Scale: 1 = Very Important
2 = Somewhat Important
3 = Not Important

significant relationships revealed a significant relationship between income and the opinion that it is very important to avoid too much fat, with the lower income group (< $25,000) being more likely to hold this opinion.

In contrast, households with more than $100,000 income per year were more likely to say it was very important to maintain a desirable weight (70%). Only 43% of the lowest income group held this opinion. The income group in which the most people said this was not important was the $35,000-$50,000 group. Females were significantly more likely to hold this opinion and to believe that one should avoid too much fat.

Where Consumers Eat

Eating At Home

Most households (56%) spent between $50 and $99 per week for groceries, although almost one-quarter (24%) spent less than $50 and one-fifth (20%) spent $100 or more per week. Two-thirds (66%) of the respondents had eaten a hot take-out meal in the past week. Forty-two percent had obtained their last hot take-out meat dish from a fast-food restaurant and for 24% from a delivery service, such as pizza delivery.

Regardless of the changes in beef consumption all parties reported preparing an average of about 3 full meals at home per week. Only 2% said none were prepared. On the other hand, only 9% said fifteen or more were prepared. When asked how many home prepared meals included a main dish of either ground beef, roast, steak or other cut of beef, the average for those who decreased or did not change their beef consumption was about 2.5 times a week. Those who had increased their beef consumption served some type of beef slightly more often (3 times per week). For example, ground beef was served once a week for most respondents who ate meat at all, but 1.5 times by those who had increased beef consumption. Ground beef was the type of beef most frequently served as a main dish at home. Eighty-six percent served it at least once in a two-week period and 43% served it three or more times. Ground beef was followed by roasts and steaks in terms of frequency of serving (Question 13). Even among the 14% who had not served ground beef in the last two weeks, almost all had served it within the past few months.

Roasts and steak were served about once every three weeks (0.3 times per week) by most respondents and about once every two weeks by those who had increased their beef consumption. Other cuts of beef were served about 0.6 times a week for all who ate beef. The majority (58%) are somewhat or very unlikely to buy a pre-prepared main dish, such as canned stew or frozen main dishes, that included some type of beef. Only 14% said they would pay more for such an already prepared dish as opposed to buying fresh beef cuts and preparing the dish themselves and 39% said they would not buy such a prepared dish at all.

Methods of Cooking Meat

When asked how they most often cooked meat, 89% of respondents said “in the oven.” This implies some type of baking or roasting which would include casseroles, frozen entrees, and other combination dishes. The second most used method of cooking meat was grilling followed by broiling. Microwave ovens were rarely used with over half of the households saying that they never cooked meat in the microwave. The average of the selections in Table 4 omits those who left the answer blank; this ranged from 19 people for “cook in the oven” to 41 people for “cook on the stove in a pot”.

Cooking Time

Based on the responses to Question 10, over half said they spent one hour or less making the main meal of the day (over three-fourths (78%) if only those who responded to this question were included in the count.) No evidence was found that a decrease in home beef consumption was correlated with a shorter time being spent preparing meals. Except for those who never used beef, those who were eating more beef spent less time

Table 4 Cooking Methods in Order of Use

	Mean Response
Cook meat in the oven	1.758
Grill meat	2.158
Broil meat	2.475
Pan-fry meat	2.565
Cook meat on the stove in a pot	2.578
Stir fry	2.592
Cook meat in the microwave	3.240

Scale: 1 = Most of the time
2 = Occasionally
3 = Rarely
4 = Never

preparing the main meal of the day than others. Those who had decreased beef consumption spent more time preparing meals. The number of minutes spent preparing the main meal of the day in relation to changes in beef consumption is given in Table 5 below. The average number of minutes leads one to conclude that saving time in preparing a main meal is not related to a decrease in beef consumption. However, the proportion of respondents who spent 30 minutes or less making the main meal was lower for those who increased beef consumption.

Table 5 Time Spent Cooking Main Meal By Beef Usage

Beef Usage	No. Respondents.	No. Minutes (Average)	Percent who spent 30 minutes or less
Never use beef	10	47.0	60
Increased beef	16	61.9	13
Increased or same	297	63.7	22
Same beef	281	63.8	22
Whole sample	495	64.4	23
Decreased beef	183	65.7	24

The time spent preparing the main meal of the day was inversely related to income as economic theory predicts, but the differences were not large. The average number of minutes reportedly spent preparing the main meal of the day by income group is in Table 6 below. With a reversal at the lower end of the income spectrum (where those with incomes between $10,000 & $24,999 spent more time than the lowest income group), it was found that the ranking from a low to high number of minutes spent preparing meals generally followed income down from high to low.

Table 6 Time Spent Cooking By Income Level

Income group	No. Respondents	Minutes to Prepare Main Meal (Average)	Percent who spent 30 minutes or less
$100,000 or over	31	58.7	26
$70~$99,999	61	61.5	21
$50-$69,999	77	61.9	23
$25~$34,999	79	62.3	29
$35-$49,999	109	63.5	29
Whole sample*	495	64.4*	23*
Under $10,000	16	64.8	31
$lO-$24,999	58	77.8	17

* Averages for all who answered this question.

The higher the income the fewer number of minutes were spent preparing the main meal; households who earned over $25,000 a year spent less than the average amount of time for the whole sample (64.4 minutes per meal). The differences, however, were not great and were not significant. Almost everyone reported spending about an hour and 5 minutes, give or take from 13 to 6 minutes. The percent of households in each income group that spent a half hour or less was greatest for the

lowest income group (<$10,000). The lowest income group spent about the overall average amount of time preparing main meals but was more likely to prepare meals in less than 30 minutes than any other income group. Figure 2 illustrates the change in time spent preparing the main meal (at home) by various income groups. It shows a slight downward trend in minutes spent after incomes are over $10,000 per year, but the lowest, the lower middle and the upper income groups were more likely to spend less than 30 minutes. The only clear message from these findings is that those with incomes between $10,000 and $25,000 per year spent the most time preparing main meals cooked at home.

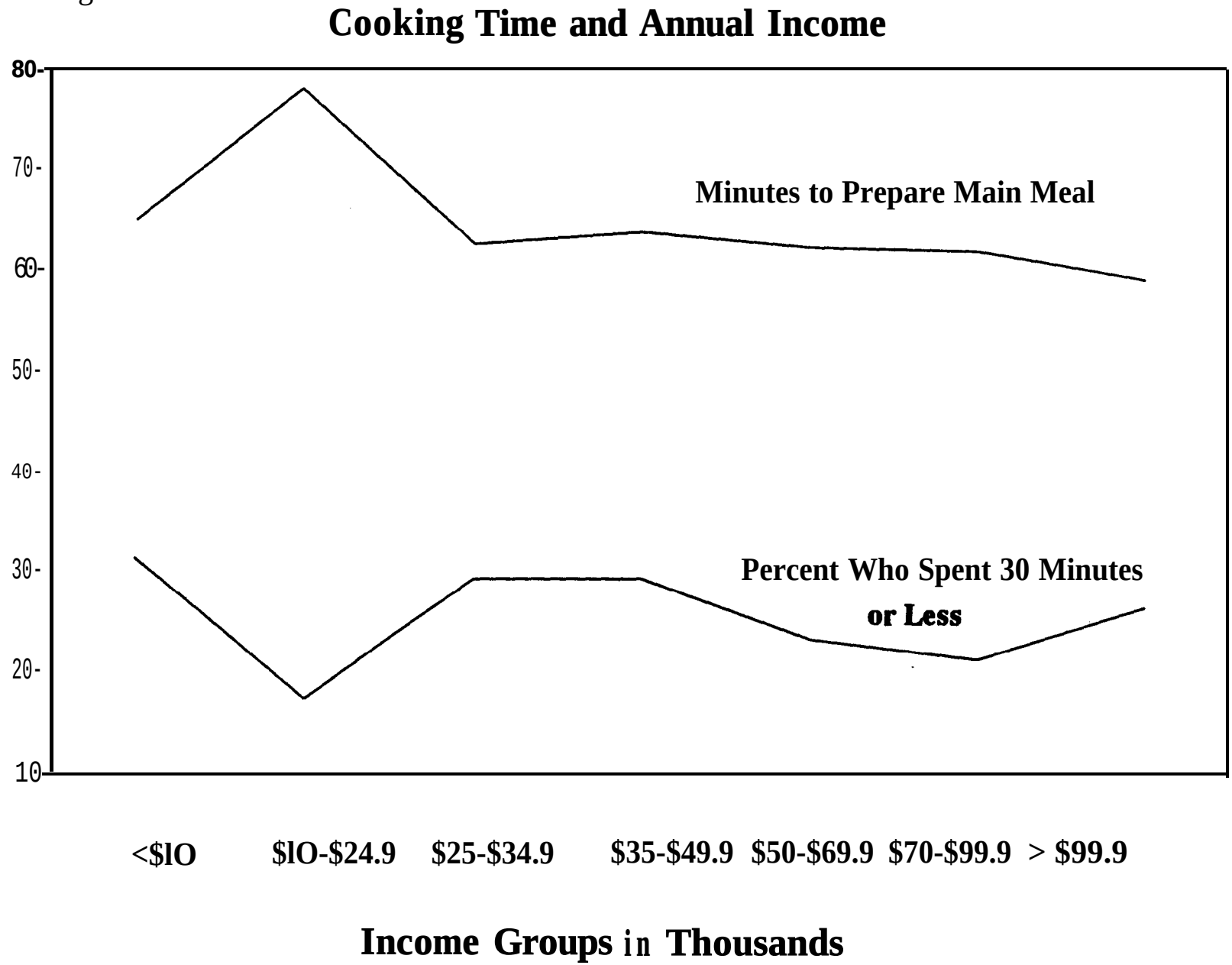
The picture is a little bit more dramatic when the income groups are collapsed into three larger groups. Table 7 illustrates those incomes and minutes preparing main meals.

Table 7 **Time Spent Cooking by Three Income Levels**

Income group	No. Respondents	Minutes to Prepare Main Meal	Percent who spent 30 minutes or less
$50,000 or over	169	61.2	23
$25-$49,999	188	63.0	26
Whole sample	495	64.4	23
Under $25,000	**74**	**75.0**	**20**

Though decreasing beef consumption seems to be unrelated to the time spent cooking, these correlations of income and cooking time indicate that higher income people do spend less time preparing meals and food that is relatively convenient to prepare will appeal to them.

Figure 2


Cooking Time and Annual Income
80
70
60
50
40
30
20
10
Minutes to Prepare Main Meal
Percent Who Spent 30 Minutes or Less
<$lO
$lO-$24.9
$25-$34.9
$35-$49.9
$50-$69.9
$70-$99.9
> $99.9
Income Groups in Thousands

Though labor force participation was unrelated to a decrease or increase in beef consumption, the time spent preparing main meals was related to the amount of time in the work place. Table 8 shows that a larger percent of full time workers spent less than a half hour preparing a meal than others and only 20% of them spent over an hour. Full time workers spent an average of 57 minutes and homemakers spent an average of 71 minutes preparing a main meal. To the extent that more people are working full time, there will be a demand for foods that can be prepared in a shorter time period.

Table 8 **Time Spent Preparing a Main Meal by Labor Force Participation**

		Minutes Preparing Main Meal		
Labor Force Status	Percent of Total Sample	< 16	<31	<61
		Percent of Each Labor Force Type		
Full time	52	5	31	80
Part time	17	1	15	61
Homemaker	10	0	12	63
Other incl. retired	21	4	17	61

Eating Away From Home

When they ate away from home, 31% most often had beef as a main dish (17% indicated hamburger, 12% steak and 2% roasts), 26% poultry, and 22% seafood. Lunch, not surprisingly, was the meal most frequently eaten away from home, followed by dinner, and lastly, breakfast. Over half (52%) ate lunch away from home at least five times per month. Only 13% had breakfast out that frequently and 38% had five or more dinners out in a month.

On average, respondents ate 15 meals a month away from home (2.2 breakfasts, 8.3 lunches and 4.6 dinners). A deviation from the average of 15 meals away from home was found for only two types of beef consumers. Those who never ate beef ate an average of 12 meals away from home; those who had increased their beef consumntion ate an average of 19 meals away from home. There appears to be a small positive, but insignificant, correlation between eating out and eating more beef.

Those who had increased beef consumption were more likely to eat steak or hamburger away from home than those who decreased beef who were more likely to order poultry or fish. Those who increased beef consumption were more likely to have eaten a hot take-out dish in the past week (78% compared to 67% for the total sample) and 73% of these take out dishes were from a fast food place.

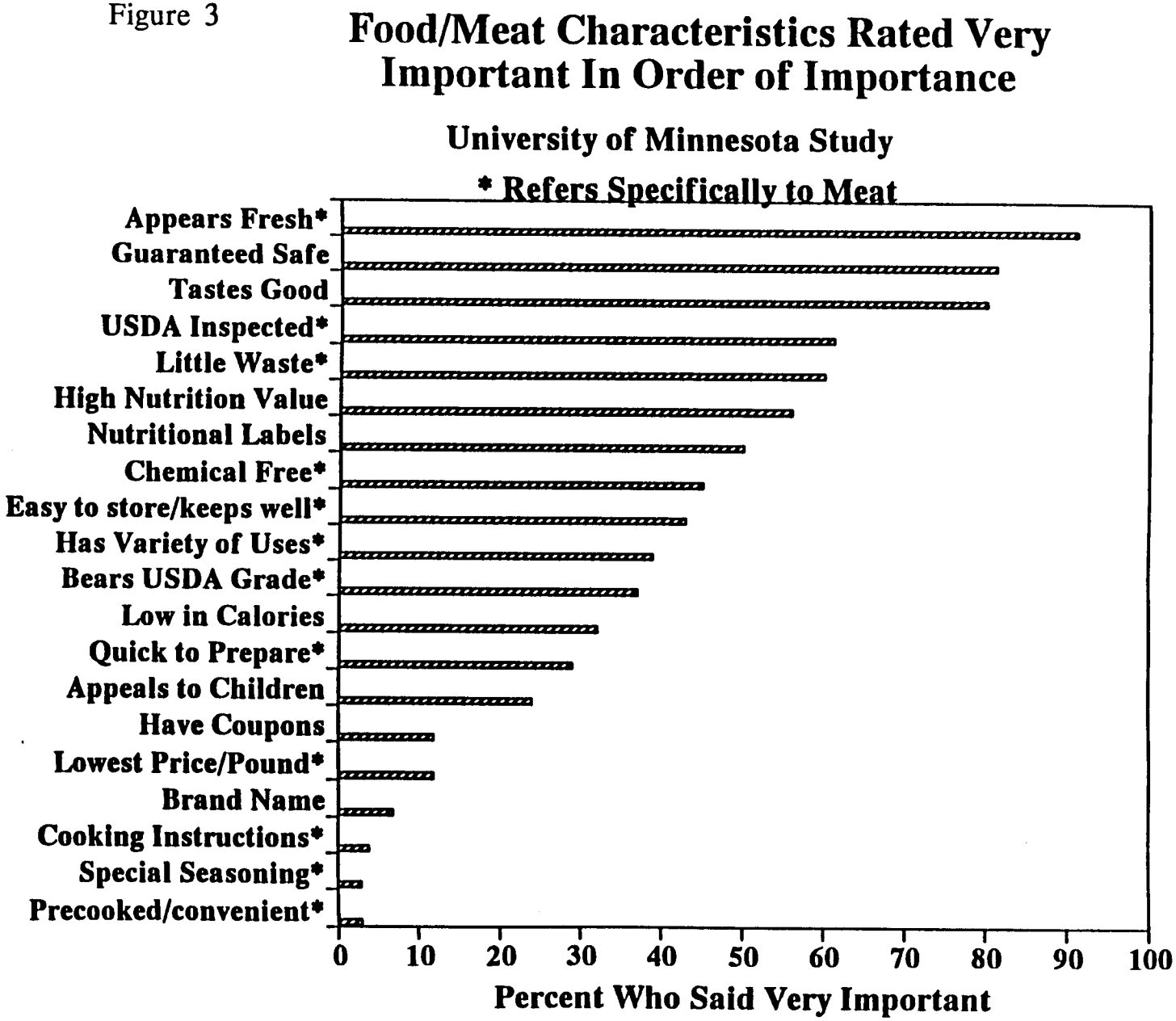
Important Attributes in Food and Meat

Questions **3** and 15 focused on the most important factors influencing the decision to buy certain types of food and meat. Based on Question 3, with regard to factors influencing overall food choices, tasting good and being guaranteed safe to eat were very important to the largest proportion of respondents, whereas appealing to children, having a brand name, and having coupons for were not very important to many consumers. Question 15 referred only to meat; 91% said it was very important that meat appear fresh. This was followed by certified as USDA inspected, which 61% said was very important, and not having a lot of waste, which 60% said was very important.

Somewhat surprisingly, being lowest in price per pound or not taking a lot of time to prepare were ranked considerably lower in importance than these factors. Only 12% said a low price was very important and 29% said the same for preparation time. Forty-five percent indicated that being certified as free of chemical residues was very important and another 34% said it was somewhat important. For those respondents who gave reasons other than those listed as influencing their decision to buy meat, the most frequently given (Question 16) relates to being lean or low in fat. Figure 3 combines the responses from Questions 3 and 15 and provides a rank ordering of the least to the most important food attributes that influence purchase decisions.

Question 18 further investigated preferences for meat characteristics. In this case consumers were asked if "given a choice, would you prefer to buy meat that had the following characteristic". Their agreement or disagreement with the characteristic reflected their priority on the particular characteristic. The order of importance of this

Figure 3


Food/Meat Characteristics Rated Very Important In Order of Importance
University of Minnesota Study
* Refers Specifically to Meat
Appears Fresh*
Guaranteed Safe
Tastes Good
USDA Inspected*
Little Waste*
High Nutrition Value
Nutritional Labels
Chemical Free*
Easy to store/keeps well*
Has Variety of Uses*
Bears USDA Grade*
Low in Calories
Quick to Prepare*
Appeals to Children
Have Coupons
Lowest Price/Pound*
Brand Name
Cooking Instructions*
Special Seasoning*
Precooked/convenient*
0
10
20
30
40
50
60
70
80
90
100
Percent Who Said Very Important

set of characteristics is given below in Table 9 and on Figure 4. (Those who answered "don't know" or left it blank are not counted in the averages in Table 9. In this case, the range of the number of people who responded "don't know" was from 15 for the number one priority to 138 for animals having been fed organic feed.)

Figure 4 illustrates this rank ordering of preferences for these meat characteristics when ordered by the percent of all respondents who said agree or agree strongly. The order changes slightly from Table 9 since, in Table 9 the factors are ordered by the average response as described above. In both cases fat trimmed off the meat and no chemical preservatives are the two most important characteristics.

This set of responses shows that having visible fat trimmed off was the highest priority. Those who had decreased beef consumption were significantly more likely to

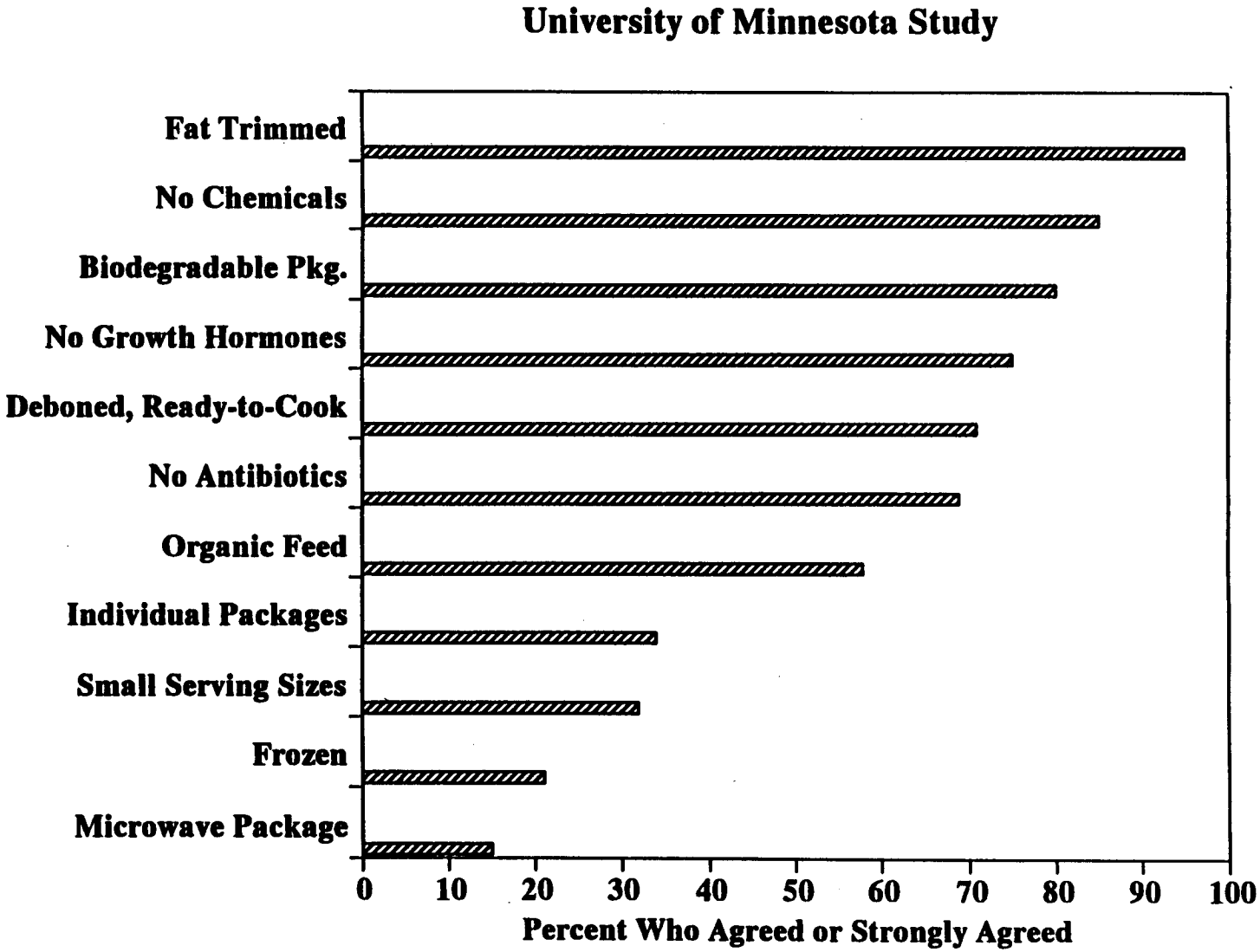
Table 9 Meat Characteristics in Order of Importance

	Mean Responses
Most of the visible fat trimmed off	1.536
Not treated with chemical preservatives	1.555
From animals not treated with growth hormones	1.594
From animals not treated with antibiotics	1.694
In a biodegradable or recyclable package	1.848
From animals fed organic feeds	1.976
Has been de-boned and cut, ready to cook	2.119
Cut into small serving-size pieces	2.666
In individually packaged servings	2.696
Already frozen	2.928
In a microwaveable package	3.150

Scale: 1 = Strongly Agree
2 = Agree
3 = Disagree
4 = Strongly Disagree

Figure 4

Percent Who Preferred These Meat Characteristics, In Order



want the fat trimmed off. The next three priority items dealt with three types of chemical additives with a preference for NOT having them present in meat. There was however, considerable ambiguity and admitted ignorance about the use of various chemicals. For example, 120 or 24% said they did not know if they preferred meat from animals fed organic feed. Fifteen percent did not know if they preferred no growth hormones; 19% did not know if they preferred meat without antibiotics. They were much more negative about chemical preservatives, with only 9% not knowing whether they preferred preservatives or not. The means reported in Table 9 reflect only the opinions of those who had an opinion.

Environmental concerns rank in the middle of this list (organic feed and recyclable packages). There was a significant difference between those who increased and decreased beef consumption with 87% of the latter preferring biodegradable packages and 70% of those who increased beef consumption wanting this type of packaging. Convenience characteristics were not ranked highly on this list of characteristics and frozen meat or meat in microwaveable packages were not desired by many at all. Almost two-thirds (63%) freeze the meat, poultry, or fish after they bring it home, 50% or more of the time. Yet, when asked if they would buy already frozen meat, given a choice, only 21% agreed.

Willingness to Pay For Special Characteristics

Almost everyone (95%) ate or prepared ground beef. Most (63%) preferred using extra lean ground beef with less than 15% fat to make hamburgers. Seventy-seven percent said they are willing to pay more for ground beef that is extra lean and of those

respondents, 65% were willing to pay $.lO to $.49 per pound more. Twenty-four percent were willing to pay less than $.lO per pound more for extra lean ground beef. In Question 22, 64% indicated they were already aware that leaner beef may result in a tougher, less tasty product. Aware of this trade-off, 45% still said they are willing to pay more for lean beef. Almost half (47%) said they had tried a hamburger that contained substitutes for fat, such as a McDonald's McLean Burger. Of those, almost two-thirds said they would buy one again.

Over half (59%) were willing to pay more for beef that is free of antibiotics and growth hormones. Of those willing to pay more, 64% would pay between $.lO and $.49 per pound; 23% were willing to pay less than $.lO per pound. Thirteen percent were willing to pay over $.49 per pound.

Food Safety Concerns

Among the food safety concerns covered in Question 30, just about everyone (90%) said eating raw beef is unsafe. A majority (52%) believed food irradiation is also unsafe. For many concerns, however, a very large proportion said they did not know whether it is safe or not. Sixty-five percent said they did not know whether meat that is a product of genetic engineering is safe or unsafe; 51% did not know about the safety of meat processed with nitrates; 41% did not know whether meat from animals that have been given antibiotics at FDA-approved levels is safe and 44% did not know if meat from animals given hormones at FDA-approved levels is safe. Three-fourths (74%) said they had not changed their beef purchasing habits due to media stories concerning the treatment of cattle in feed lots and packing plants, although 23% said they were purchasing fewer beef products. Of those who thought they knew if the food or food processes were safe, the majority thought that most of the factors were unsafe.

The list of the mean responses in Table 10 is in order of the factors that people thought was the most to the least safe. The percent who answered “don’t know” reveals considerable ignorance and uncertainty about this topic.

Table 10 Food Safety Characteristics in Order of Perceived Safety

Food Safety Factor	Mean Response	Percent Don't Know
Generally Believed Safe		
Meat that has been both cooked and refrigerated at the store	1.306	40
Meat from animals that have been given antibiotics at FDA approved levels	1.375	40
Foods that have been treated to be shelf-stable for weeks without refrigeration	1.496	33
Generally Believed Unsafe		
Foods made at home with raw eggs, such as homemade ice cream, homemade mayonnaise, or Caesar salads	1.524	18
Meat from animals that have been given hormones at FDA approved levels	1.532	44
Meat that is a product of genetic engineering	1.545	65
Meat processed with additives and preservatives	1.581	40
Foods that have been treated with radiation	1.804	35
Meat processed with nitrite	1.844	52
Eating raw beef	1.956	6

Scale: 1 = Safe
2 = Not safe

Chemicals

Two-thirds said they had not changed their beef purchasing habits as a result of media stories about the use of antibiotics and growth hormones in beef production, although one-quarter said they did. About 38% of the sample (64% of the 59% who were willing to pay more) indicated they would be willing to pay $.lO to $.49 more per pound for beef that is free of antibiotics and growth hormones.

Questions about meat that is produced with the use of some type of chemical, drug or hormone were significantly correlated with both increasing and decreasing beef

consumption. The word "chemical" is used to capture all these substances while recognizing that it may not be technically correct in all cases. Table 11 shows the percent of those who decreased versus those who increased their beef consumption of those who held specific opinions.

Table 11 **Opinions about "Chemical" Use**

Opinion/Preference	Percent of those who: decreased beef consumption	increased beef consumption
1. Preferred animals not treated with growth hormones	57	33
2. Preferred animals not treated with antibiotics	47	33
3. Preferred not to buy meat treated with chemical preservatives	55	33
4. Preferred to buy meat from animals fed organic feed.	65	50
5. Disagreed that animals treated with antibiotics at FDA approved level are safe.	29	6
6. Disagreed that animals treated with hormones at FDA approved levels are safe.	35	6

Putting the percentages in items 5 and 6 in Table 11 in perspective, about 60 people out of 515 or 11% of the total sample did not believe that animals treated with antibiotics or hormones at levels approved by the FDA were safe. This is a comment on the trust in government regulation as well as on the concern about such treatments. This suspicion was much greater among those who decreased their beef consumption which illustrates the choices consumers have in this market.

One-third of those who increased beef consumption were concerned about hormones, antibiotics and chemical preservatives. Over half of those who decreased beef consumption were concerned about hormones and chemical preservatives. Forty-five percent of all respondents said it was very important for meat to be certified free of chemicals; this did not vary by changes in beef consumption.

Cattle Industry Issues

Four questions were asked in order to learn more about concerns over practices in the cattle industry. Respondents were asked to agree or disagree with four statements; two of these further probed opinions about the use of chemicals.

In terms of issues concerning the beef cattle industry in Question 27, most people were worried about chemicals used in beef cattle production, but not about cattle being treated inhumanely or beef production damaging the environment. The majority (57%) strongly agreed there should be more monitoring of chemical use in beef cattle production, and another 32% agreed. Thirty-eight percent said they do not know whether the chemicals used are safe and 34% disagreed or strongly disagreed that they are safe. Of those who thought they knew, over half (56%) disagreed that the current use of chemicals is safe; 70% of those who decreased beef consumption disagreed. These results suggest a deep suspicion of the use of chemicals and a deep ignorance about their impact. An educational program is suggested.

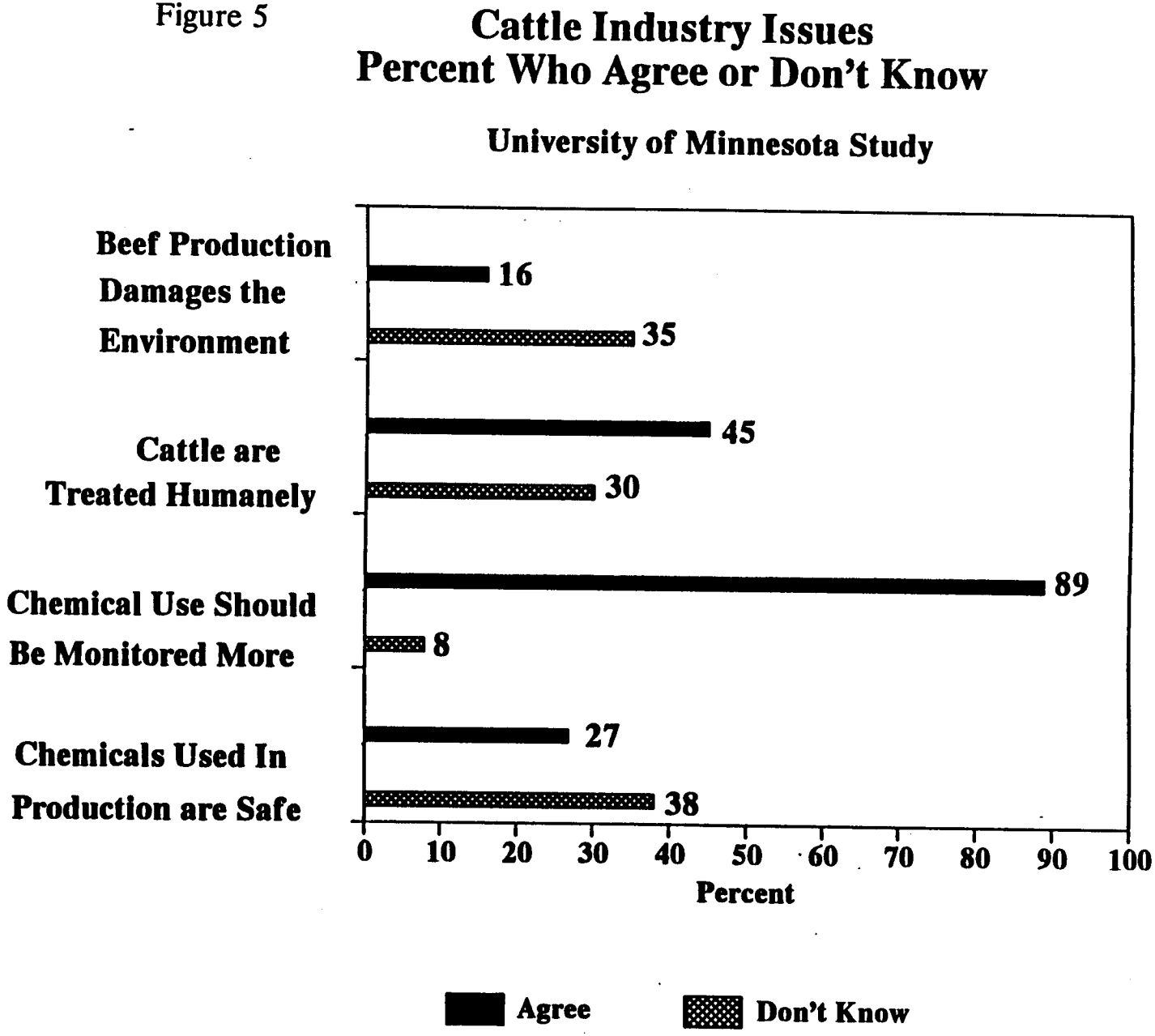
In light of Jeremy Rifkin's book, Beyond Beef, and the surrounding publicity, opinions about whether the production of beef damages the environment might be important. In this sample, 25% did not know if they agreed that the environment was damaged by raising cattle, but, of those who had an opinion, only 16% agreed that it did. Those who decreased beef consumption were significantly more likely to agree that there was environmental damage.

There has been some publicity about the alleged inhumane treatment of animals during the production of beef. Thirty percent did not know what they thought about this

issue; one fourth believed cattle are not treated humanely and 45% believed that they are treated humanely. Those who had decreased beef consumption were significantly less likely to agree. Figure 5 illustrates the magnitude of concern and uncertainty about public policy issues surrounding the cattle industry.

.

Figure 5


Cattle Industry Issues
Percent Who Agree or Don't Know
University of Minnesota Study
Beef Production Damages the Environment
16
35
Cattle are Treated Humanely
45
30
Chemical Use Should Be Monitored More
89
8
Chemicals Used In Production are Safe
27
38
0
10
20
30
40
50
60
70
80
90
100
Percent
Agree
Don't Know

Socioeconomic Characteristics of the Sample

In terms of a socioeconomic profile, the households who responded to this survey were better educated than the general adult population, more of them owned their home, and more were married with children. Of the respondents to Questions 32-43, 85% owned their homes, the median age was 45, and 71% were women. Since we asked for the person who does most of the food preparation/shopping to answer the question, we expected to have more women than men respond to the survey. These women were presumably the wives in married couple households or the sole householders when a man was not present. Twenty-three percent were married couples without children; 42% had children in the home. Eighteen percent were single and 6% were single parents with children.

Age was significantly related to a decrease in beef consumption for people over the age of 35. Of those over age 35, 39% decreased their beef consumption versus 27% of those under age 35. Of those who decreased their beef consumption only 15% were under the age of 35. Only one respondent over the age of 65 increased beef consumption.

In terms of education, only 4% of the respondents were not high school graduates, 38% were college graduates and another 23% had some college education, but had not graduated. Twelve percent had post-graduate or professional degrees and 16% had gone to at least some technical school. Twenty percent ended their schooling with high school graduation.

Over half (52%) of the respondents were employed full time, 40 or more hours per week. Another 17% worked part-time or on a seasonal basis; 16% were retired, and

only 11% said they were full time homemakers. Those who worked part time in the labor force were somewhat more likely to have decreased beef consumption than full time homemakers and retired people. Sixty-nine percent of the respondents' spouses/partners, who were usually men, worked full time. The median hourly wage of the respondents who were employed was about $11.90 per hour. The median monthly salary was $2,500. Only 4% of the households had a total income in 1992 below $10,000 and 7% had incomes of $100,000 and over. Fifteen percent were between $10,000 and $24,999; 18% between $25,000 and $34,999; 25% between $35,000 and $49,999; 18% between $50,000 and $69,999; and 14% between $70,000 and $99,999. This income distribution is higher than the average for U.S. households. Those with more income were more likely to have decreased beef consumption. Forty-two percent of those in households that earned over $50,000 a year decreased their beef consumption compared to 36% of the households with lower income.

The typical household had 2.3 persons, which is very close to the national average household size. Not surprisingly given the ethnic background of Minnesotans, most respondents said they were either of Scandinavian, German, or mixed European origin and virtually all (98%) indicated they were white.

A comparison of the demographic characteristics of the respondents in this survey and the general population of the United States is given in Table 12.

Table 12 Socioeconomic Characteristics of Households in the Sample and in the United States

	Sample (1993)	U.S. (1987/88)
	Percent of Households	
Owned Homes	85	57
Median Age of Adults	45	na
Married Couples with Children	42	28
Married Couples without Children	33	30
Education		
Not High School Graduate	4	26
High School Graduate	20	36
College Graduate	26	11
Post-Graduate Degree	12	5
Employed Full Time	52	50
Retired	16	na
Homemaker	11	na
Median Wage	$11.90	$6.73
Income		
< $10,000	4	18
$10,000 - $24,999	15	30
$25,000 - $34,999	18	16
$35,000 - $49,999	25	17
$50,000 - $69,999	18	12 [1]
$70,000 - $99,999	14	-
> $100,000	7	6 [2]
Household Size	2.3 persons	2.6 persons
White Race	98	84

[1] For the U.S., this percent is for incomes between $50,000 and $74,999.

[2] For the U.S., this percent is for incomes over $95,000.

Source of U.S. Data: Statistical Abstract of the United States, 1990

na means "not currently available".

Niche Markets

One of the goals of the project was to identify market niches for particular food attributes. Niches were identified by clustering those respondents together who had similar opinions or attitudes about the importance of particular food/meat characteristics. For example, the "low fat" niche is made up of those people who thought that avoiding too much fat and too much saturated fat was "very important". Each niche is identified by its size and proportion of the total sample in Table 13. This gives an idea of the relative size of this market. The characteristics of people in each niche are then identified by the distributions of income, education, employment, sex, and age relative to the entire sample. Some of the other attitudes they held in common are also noted.

Table 13 Market Niches

Niches	Percent of Sample:
Low Fat	58
Low Fat and Low Cholesterol	46
Maintain Weight and Low Calories	25
Low Fat, Cholesterol, Calories and Maintain Weight	17
Convenience	2.3
Chemicals	11
Safety	52
Environment	28
Price Conscious	19

Low Fat:

This niche is made up of people who said it is very important to avoid too much fat and avoid too much saturated fat.

* 58% of the sample
* Little difference across income or education

* More likely to be retired, over age 65, female, and not working full time[3]

Of the people in this niche:

* 71% also felt it was very important to maintain a desirable weight
* 79% also felt it was very important to avoid too much cholesterol

Explanation:

This niche is rather large. It implies that over half of the people were concerned about holding down the fat content of their diet. About three-fourths of these people also are concerned with maintaining a desirable weight and avoiding too much cholesterol. This is clearly an important and large part of the market. Full time workers were less likely to show this concern (7% fewer than in the total sample) while part time workers, homemakers and especially retired people were over represented among those with this opinion.

Low **Fat and Low Cholesterol:**

This niche is made up of all the people in the low fat niche plus those who also said it was very important to avoid too much cholesterol.

* 46% of the sample
* More likely to have lower incomes, be retired, over age 65, female and have a post graduate degree.
* Less likely to work full time and be under age 35.

Explanation:

Adding those who were also concerned about cholesterol decreased the size of the low fat niche and some differences in income and education appear. Those with incomes between $10,000 and $25,000 were more likely to have this combination of

[3] "More likely" is defined as those types of people who were over represented in the niche relative to the total sample; e.g. in the Low Fat niche, there are 4.3% more retired people than in the total sample.

concerns while those with incomes between $25,000 and $50,000 (middle income households) were somewhat less likely to have all these concerns. College graduates with a bachelor's degree were less likely to be in this group but those with post graduate degrees were more likely to have all these concerns. Full time workers were under represented by almost 10% in this group. Those under age 35 were under represented by 4.5%.

Over all this is an older, highly educated group, with many females. It is not the middle age, middle income, full time worker.

Maintain Desirable Weight and Have Low Calorie Food:

This niche is made up of people who said it is very important to maintain a desirable weight and buy food products that are low in calories.

* 25% of the sample
* More likely to be part-time workers or retired, over age 65, female or have incomes between $35,000-$50,000 or over $100,000
* Not likely to have an educational degree at any level

Explanation:

This niche draws people from two diverse income groups and an unusual set of educational achievements. Those who had some high school, some technical school or some college were over represented, but those who had achieved an educational degree at any level were under represented. Females were predominate with more than 15% more females in this niche than in the total sample.

Overall, this niche is made up of females with middle or high income, at all educational levels except those with degrees at any level, and not working full time.

Older people seem to be more concerned about maintaining their weight and eating food low in calories than younger and middle aged people.

Low Fat, Low Cholesterol, Low Calories, & Maintain Weight:

This niche is made up of people who said it is very important to avoid too much fat, saturated fat, and cholesterol, to buy food products that were low in calories, and to maintain a desirable weight. It is a combination of the last two niches.

* 17% of the sample
* More likely to have incomes less than $50,000 or over $100,000, some technical and some college training, female, and over age 65
* Not likely to be full time workers

Explanation:

As in the niche of consumers who wanted to maintain a desirable weight and eat low calorie food, it is the upper middle income groups that do not belong ($50,000-$100,000) and the high and middle income groups that do belong. Again those with some technical school or some college are more likely to hold all these opinions. Full time workers are under represented by 10% and females over represented by 17%.

Overall, this niche is more likely to be populated by females, retired people, those with less than a college degree but more than a high school degree, lower middle or very high incomes and not working full time.

Convenience:

This niche is made up of people who said it was “very important” to buy meat that doesn’t take a lot of time to prepare, that has been de-boned and cut, ready to cook, that is cut into small serving-size pieces, and that is in individually packaged servings. These characteristics make up a variety of treatments that can be applied to meat to

make it more convenient to prepare at home.

* 2.3% of the sample
* More likely to have lower incomes, less than a college education, be female, retired, and over age 65.

Explanation:

This niche has some surprises. Rather than the members being high income, college educated women, as one might expect, they are low income (less than $25,000), retired, women with less than a college education. If the responses of "somewhat important" are added, this niche grows to 17% of the sample and includes full time workers.

Perhaps retired people just do no want to spend a lot of time fixing meat at home or their small household size is best served by small portions. Also, their growing lack of manual dexterity may lead them to prefer deboned and precut meats.

Chemicals:

This niche is made up of people who said it is very important to buy meat certified free of chemical residues, from animals not treated with growth hormones and/or antibiotics, not treated with chemical preservatives, and from animals fed organic feeds. Acknowledging that all these meat treatments may not technically be "chemicals", it is a code word well understood among the public and used to identify this niche.

* 11% of the sample
* More likely to be part time workers, retired, students, female, over age 65, and have lower incomes
* Not likely to have earned a degree at any level

Of the people in this niche:

* 98% strongly agreed that there should be more monitoring of chemical use in

cattle production.

* 54% disagreed with the idea that chemicals used in beef production and processing are safe.
* 40% purchased less beef as a result of media stories about the use of antibiotics and growth hormones in beef production.
* 41% say that foods treated to be shelf-stable are not safe.
* 67% say that meat processed with additives and preservatives are not safe.

Explanation:

This is not a very large niche, but the people in it feel rather strongly about food safety issues. They are basically very suspicious about the safety of food and meat. Two fifths of them have decreased beef consumption due to a fear of antibiotics or growth hormones; 20% do not eat meat at all.

People in this niche are more likely to be from lower income households. Again those with some high school, technical school and college are more likely to be concerned than those who had finished educational degrees at any level. College and higher educated people were the least likely to be in this niche, as were full time workers.

Overall, this niche is made up of females, retired people with less than a college education and lower incomes.

Food Safety:

This niche is made up of people who said it is very important to buy food products that are guaranteed safe to eat and to buy meat that is certified as USDA inspected.

* 52% of the sample
* More likely to have lower incomes, have a high school education or some technical school training, to be female, over age 65
* Not likely to be full time workers

Of those people in this niche:

* 37% said that meat from animals given antibiotics at FDA approved levels is safe; 25% say it is not.
* 22% said that meat from animals given hormones at FDA approved levels is safe; 34% say it is not.

Explanation:

This is a rather large niche. Many people preferred to have the safety of their food guaranteed, yet many did not trust the standards set by government agencies. Those concerned were slightly more likely to have lower incomes (less than $25,000), but the concern was fairly evenly distributed across income groups. Those with less than a college education were more likely to belong to this niche, as were the retired and females.

Overall, this niche is made up of females, older and retired people, and those with less than a college education.

Environment:

This niche is made up of people who strongly agreed with the statement: “Given a choice, I would prefer to buy meat in a biodegradable or recyclable package”. This is only one indicator of the environmental concerns but it is related to the way people purchase food.

* **28%** of the sample
* More likely to be female, full time workers, homemakers, students, younger to middle aged, have higher incomes, and have attended college.

Of the people in this niche:

* 39.3% disagree with the statement "The production of beef damages the environment”, 15.8% agree, while 40% say they don’t know.

Explanation:

This niche draws from a different part of the population than the niches above that deal with health and safety concerns. Females are still more likely to be over represented, but the people here are more likely to be full time workers, younger, have higher incomes and more education. This might be called the "socially conscious" group. The income groups more likely to belong make over $35,000; they include students and homemakers as well as full time workers, but not retired people.

In spite of their strong interest in the environment, they do not generally believe that the cattle industry is damaging to the environment.

Price Conscious:

This niche is made up of people who said it is "very important or somewhat important" to buy meat that is the lowest price per pound or per ounce and are not willing to pay (WTP) more for ground beef that is guaranteed extra lean.

* 19% of the sample
* More likely to have low to moderate incomes, full time workers or unemployed, and be less than age 34
* Not likely to have a degree at any educational level

Explanation:

This is a rather small niche. Only about one fifth of the people were very concerned about the price of food. They were most likely to have incomes between $10,000 and $50,000 and not to have achieved an educational degree. College educated people were less likely to be in this group.

Overall this niche is made up of middle income, younger, full time workers or unemployed people with less than a college education.

Niche Summary

Full time workers, who make up over half the total sample and about half of the total population, were more likely to be concerned about convenience, the environment and the price of food especially if they are young and have household incomes less than $50,000 a year. They were not more likely to be concerned with health and safety characteristics such as fat, calories, chemicals or safety features.

Women were more likely than men to be concerned about all of the issues addressed in the niches except convenience.

Older and retired people were more likely to be concerned with fat, cholesterol, calories and weight as well as food safety, convenience, and chemicals. They were not more likely to be concerned about the environment.

The young (under age 35) were more likely to be concerned with the environment and prices. They were not more likely to be concerned with fat or other health and safety issues.

Lower income households were concerned about price, convenience and all the health and safety issues including low fat.

Middle income households were also price conscious and concerned with maintaining a desirable weight with low calorie food, but they were the least likely to be concerned about fat and cholesterol or food safety.

High income households were more likely to be concerned with all aspects of fat and cholesterol and calories and with the environment. This was also true for the highly educated post graduates. These people were not over represented in niches concerned

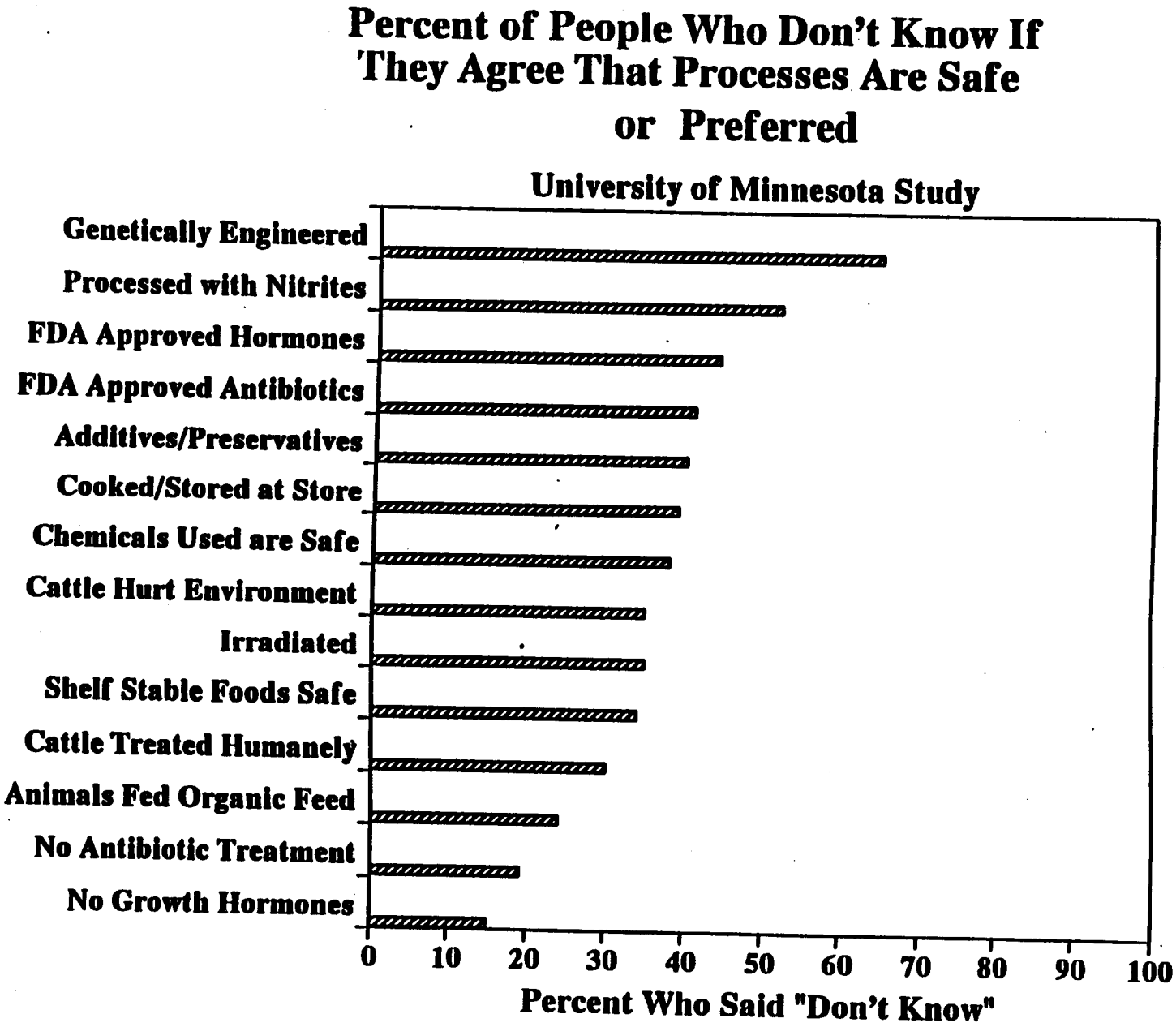
with safety or chemicals. These concerns belong more strongly to those will less than a college education.

Educational Opportunities

There were many consumers who responded “don’t know” to several questions pertaining to the safety of various procedures or processes. Many of these have to do with new technologies such as genetic engineering and irradiation. Others have to do with producing meat with the help of hormones, antibiotics and other additives. Figure 6 illustrates the order of magnitude of the “don’t know” responses with uncertainty about genetic engineering heading the list. The responses to hormones and antibiotics is interesting in that many (41 to 44 percent) did not know if the FDA approved levels are safe but only 15 to 19 percent did not know if they would prefer no hormones or antibiotics in their meat. Only 9 to 11 percent said they would prefer to buy meat without antibiotics or hormones, given the choice. On the other hand, 22 to 30 percent said that the FDA approved levels of hormones and antibiotics are safe. This seems to indicate that consumers realize that some level of these substances is useful in beef production and probably acceptable and safe. They are not at all sure that the government regulated levels are safe or that they are enforced. This raises as many questions about the trust in government regulations as in the use of the substances themselves.

In any case, there is room for several educational programs regarding these issues. There is a lot of self-confessed ignorance about the issues on Figure 6 and an opportunity for industry and educators to be useful to consumers.

Figure 6


Percent of People Who Don't Know If They Agree That Processes Are Safe or Preferred
University of Minnesota Study
Genetically Engineered
Processed with Nitrites
FDA Approved Hormones
FDA Approved Antibiotics
Additives/Preservatives
Cooked/Stored at Store
Chemicals Used are Safe
Cattle Hurt Environment
Irradiated
Shelf Stable Foods Safe
Cattle Treated Humanely
Animals Fed Organic Feed
No Antibiotic Treatment
No Growth Hormones
0
10
20
30
40
50
60
70
80
90
100
Percent Who Said "Don't Know"

Statistical Analysis of Changes in Beef Consumption

Based on the answers to Question **4,** a set of five two-stage probit regression equations were analyzed to determine the probability of consumers increasing, decreasing, or not changing their beef, pork, poultry, egg or fish and seafood consumption over the past year. The results tell us how the probability of increasing, decreasing or not changing consumption of each of these products would change if and when each of a number of attitudes were held, or socioeconomic factors were true, relative to the average set attitudes and household characteristics of the sample. The same attitudes and characteristics were not significant in explaining changes in consumption for all types of animal food products. Those that were significant are discussed for each type of animal food product starting with beef.

Beef

The marginal effects of the variables that were significant in explaining changes in the probability of having changed beef consumption are presented in Table 14. The overall estimated probability of increased beef consumption was 0.02, the probability of decreased beef consumption was 0.38, and the probability of no change was 0.60. The results show that as income increased through the income brackets identified in Question 43, the probability of decreasing beef consumption increased by 0.05. Likewise, as education (EDUC) increases throughout the educational levels in Question 37, the probability of decreasing beef consumption increased by 0.03. Increasing income and education increases the likelihood that consumers will consume less beef.

Attitudes that were significantly related to changes in beef consumption were concern about fat and cholesterol (FTCHOL), chemicals (NCHEM), food waste

(WASTE), and recyclable/biodegradable packaging (RECY). Belonging to the low fat and cholesterol niche (46% of the sample) increased the probability of decreasing beef consumption by 0.14 and decreased the probability of increasing beef consumption by 0.02. Given the initial estimated probabilities, being in this niche decreased probability of increasing beef from 0.02 to 0.003 and increased the probability of decreasing beef consumption from 0.38 to 0.52. We do not know what types of beef each of these groups increased or decreased, but we know they were more likely to decrease beef consumption.

Table 14 Probit Estimates of the Probability of Changing Beef Consumption

	Decrease Beef	Increase Beef	No change
Overall Probability	0.38	0.02	0.60
Significant Variables	Change in Probability		
FTCHOL	0.14	-0.02	-0.12
NCHEM	0.30	-0.02	-0.27
WASTE	-0.2 1	0.02	0.19
RECY	0.10	-0.02	-0.08
INCOME	0.05	-0.01	-0.04
EDUC	0.03	-0.004	-0.02
YPOULTRY	0.13	-0.02	-0.11
YFISH	0.23	-0.03	-0.20

Belonging to the “no chemical” niche (NCHEM) tended to increase the probability of decreasing beef consumption by 0.30 and decreased the probability of increasing beef consumption by 0.02. This is a small niche (11% of the sample), but

those in this niche were more likely to have decreased their beef consumption in the past year.

Those concerned about buying meat that doesn't have a lot of waste (WASTE) were less likely to decrease their beef consumption and actually increased their consumption of beef. The probability of decreasing beef consumption decreased by 0.21 while the probability of increasing beef consumption increased by 0.02.

How meat is packaged appears to affect meat consumption patterns. Believing in the importance of biodegradable or recyclable packaging (RECY) increased the probability of decreasing beef consumption by 0.10 while the probability of increasing beef consumption decreased by 0.02. Thus, those concerned about the environment were more likely to decrease beef consumption.

Treating substitute food products such as poultry and fish as continuous variables shows that as the consumption of poultry or fish increased, consumption of beef was likely to decrease. The probability of decreasing beef consumption increased by 0.13 (0.23) as the consumption of poultry (fish) increased whereas the probability of increasing beef consumption decreased by 0.02 (0.03) as poultry (fish) consumption increased. This substantiates the substitutability of animal food products in the diet.

Figure 7 illustrates the magnitude of the changes in the average probability of decreasing beef consumption starting with the factor with the greatest impact at the bottom (belonging to the no chemical niche) and moving to the least important variable at the top (an increased amount of education).

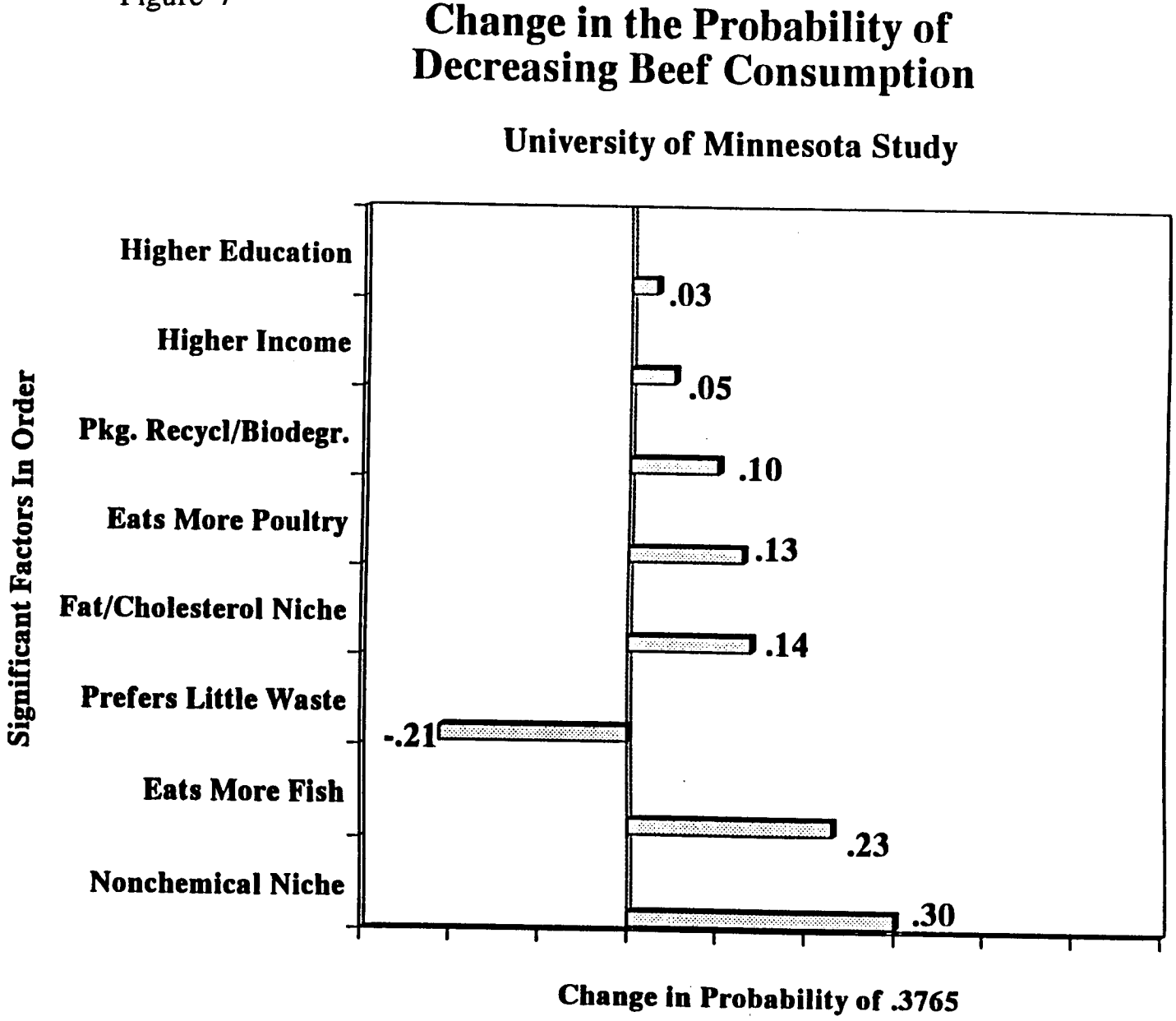
Pork

The marginal effects of the variables that were significant in explaining changes in the probability of changing pork consumption are presented in Table 15. The estimated probability of increased pork consumption was 0.12 while the probability of decreased pork consumption was 0.25. The probability that pork consumption did not change is 0.63.

Older people tended to increase their pork consumption. As age increased, the probability of decreasing pork consumption decreased by 0.004 while the probability of increasing pork consumption increased by 0.003.

As indicated by the variable "SEX", females were less likely to decrease and more likely to increase pork consumption than were males. Being female decreased the probability of decreasing pork consumption by 0.13 while the probability of increasing pork consumption increased by 0.08.

Figure 7


Change in the Probability of Decreasing Beef Consumption
University of Minnesota Study
Significant Factors In Order
Higher Education
Higher Income
Pkg. Recycl/Biodegr.
Eats More Poultry
Fat/Cholesterol Niche
Prefers Little Waste
Eats More Fish
Nonchemical Niche
.03
.05
.10
.13
.14
-.21
.23
.30
Change in Probability of .3765

As with beef, belonging to the "no chemical" niche (NCHEM) increased the probability of decreasing pork consumption by 0.23. Those concerned about various types of chemicals were more likely to decrease pork consumption.

Attitudes that indicate a quest for convenience - belonging to the NCONV niche - wanting meat that is fast to prepare, deboned, ready to cook, cut into small pieces etc., significantly increased the probability of increasing pork consumption. The increase in

Table 15 Probit Estimates of the Probability of Changing Pork Consumption

	Decrease Pork	Increase Pork	No change Pork
Overall Probability	0.25	0.12	0.63
Significant Variables	Change in Probability		
NCHEM	0.23	-0.10	-0.13
NCONV	-0.20	0.29	-0.09
WASTE	0.10	-0.09	-0.01
SEX	-0.13	0.08	0.06
AGE	-0.004	0.003	0.001
YEGGS	-0.12	0.08	0.04

the probability of increasing pork was 0.29 while the decrease in the probability of decreasing pork was 0.20.

Not wanting there to be much waste on the meat (WASTE) significantly increased the probability of decreasing pork consumption. The increase in the probability of decreasing pork is 0.10.

The only substitute product that significantly affected the probability of changing pork consumption was eggs. As egg consumption increased, pork consumption increased. The probability of decreasing pork consumption decreased by 0.12 as egg consumption increased, while the probability of increasing pork consumption increased by 0.08. Eggs and pork appear to be complimentary, or, at least people who eat more eggs were not likely to decrease their pork consumption. Again, we do not know what types of pork products increased, but the compatibility of pork breakfast meats with eggs would be a logical explanation for why those who eat more eggs also eat more pork.

Figure 8 illustrates the variables that were significant in explaining decreases in pork consumption in the order of their importance.

Poultry

The marginal effects of the variables that were significant in explaining changes in the probability of changing poultry consumption are presented in Table 16. The estimated probability of increased poultry was 0.43 while the estimated probability of decreasing poultry was 0.06 with a 0.51 probability of no change in the past year. Females were more likely to increase poultry consumption. Being female increased the probability of increasing poultry by 0.12. Being nonwhite (ETH5) decreased the probability of increasing poultry by 0.21. This is an interesting finding since in most food consumption studies, nonwhites are found to eat more poultry than whites.[4] This finding speaks to the question of change, however, without addressing the starting level.

[4] *See Food Trends and The Changing Consumer* by Senauer, Asp and Kinsey, p. 75.

Figure 8

Change in the Probability of Decreasing Pork Consumption

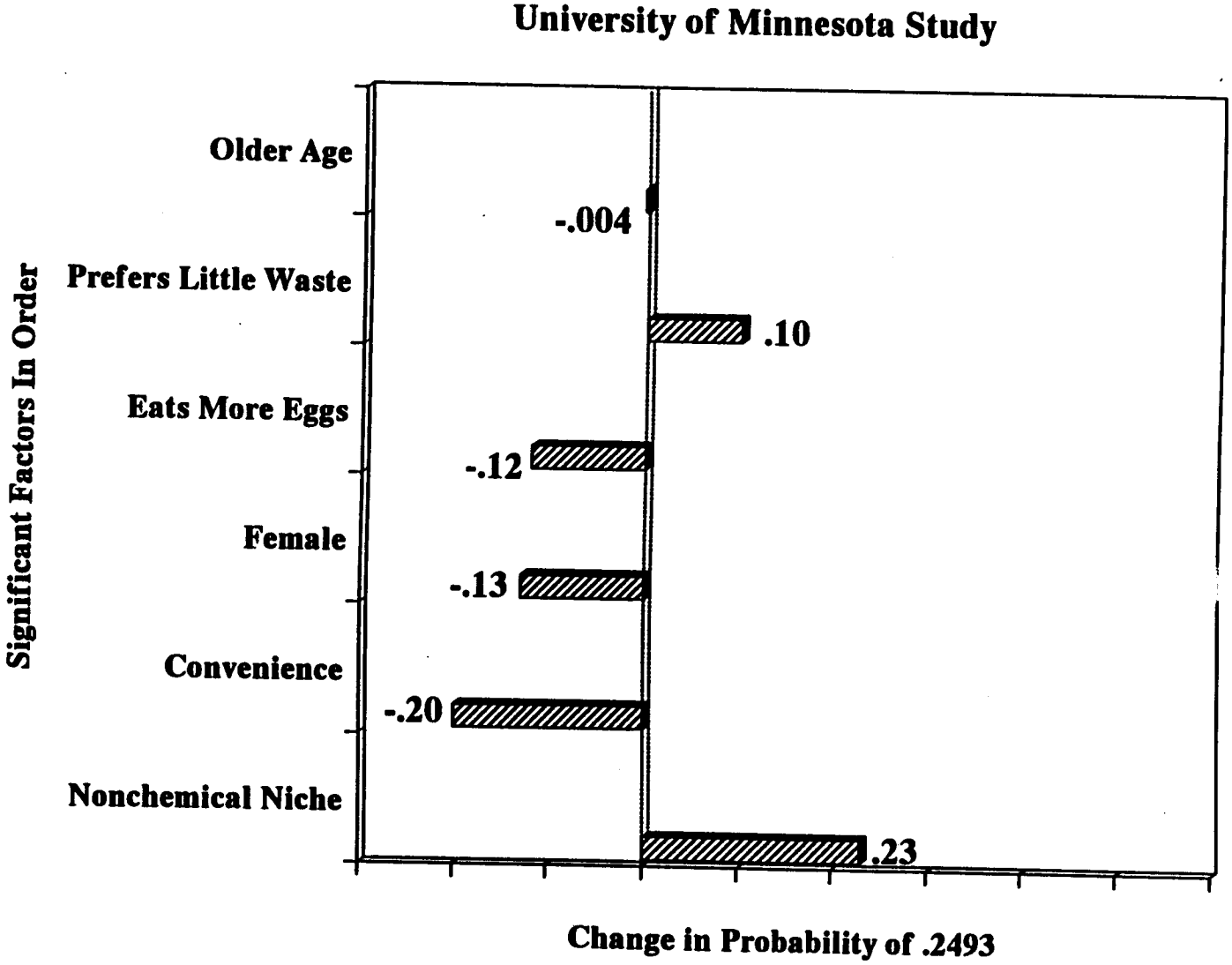


Table 16 Probit Estimates of the Probability of Changing Poultry Consumption

	Decrease Poultry	Increase Poultry	No change Poultry
Overall Probability	0.06	0.43	0.51
Significant Variables	Change in Probability		
NCHEM	0.08	-0.18	0.11
FTRIM	-0.10	0.21	-0.11
LPRICE	-0.03	0.09	-0.06
WASTE	-0.16	0.27	-0.12
SEX	-0.04	0.12	-0.08
ETH5	0.10	-0.21	0.11
YBEEF	0.06	-0.21	0.15
YFISH	-0.10	0.35	-0.25

Perhaps, if the level is already relatively high for nonwhites, they are less likely to be increasing poultry consumption.

As with beef and pork, those concerned about the use of chemicals in meat (NCHEM) were more likely to have decreased consumption of poultry. Belonging to the "no chemical" niche increased the probability of decreasing poultry by 0.08 and decreased the probability of increasing poultry by 0.18. Wanting fat to be well trimmed (FTRIM), seeking low prices (LPRICE), and wanting meat that does not have a lot of waste (WASTE) generally supported an increase in poultry consumption. The biggest impact was an increase of 0.27 in the probability of increasing poultry if consumers do not want a lot of waste.

The consumption of beef and fish significantly affected poultry consumption. People who increased beef consumption were more likely to decrease poultry whereas those who increased fish consumption were more likely to also increase poultry. The probability of increasing poultry consumption fell by 0.21 as beef consumption increased. As fish consumption increased, the probability of increasing poultry increased by 0.35.

Figure 9 illustrates the change in the probability of increasing poultry consumption in the order of magnitude of the significant variables.

Fish and Seafood

The marginal effects of the variables that were significant in explaining changes in the probability of changing fish consumption are presented in Table 17. The estimated probability of increased fish consumption was 0.22 compared to the estimated probability of decreased fish consumption of 0.10. There was a .68 probability that households did not change their consumption of fish and seafood. Increasing education (EDUC) decreased the probability of increasing fish consumption by 0.02. Growing older (AGE) increased the probability of increasing fish consumption by 0.007. Thus, older people are more likely to increase their consumption of fish. This is important in the face of an aging population.

Belonging to the "no chemical" niche (NCHEM), to the "other" (OTH) employment category (retired, disabled, unemployed, or a student), being in the ethnic group characterized as European (ETH1), in the ethnic group characterized as Scandinavian (ETH2), and being in the ethnic group characterized as English, Irish, or

Figure 9

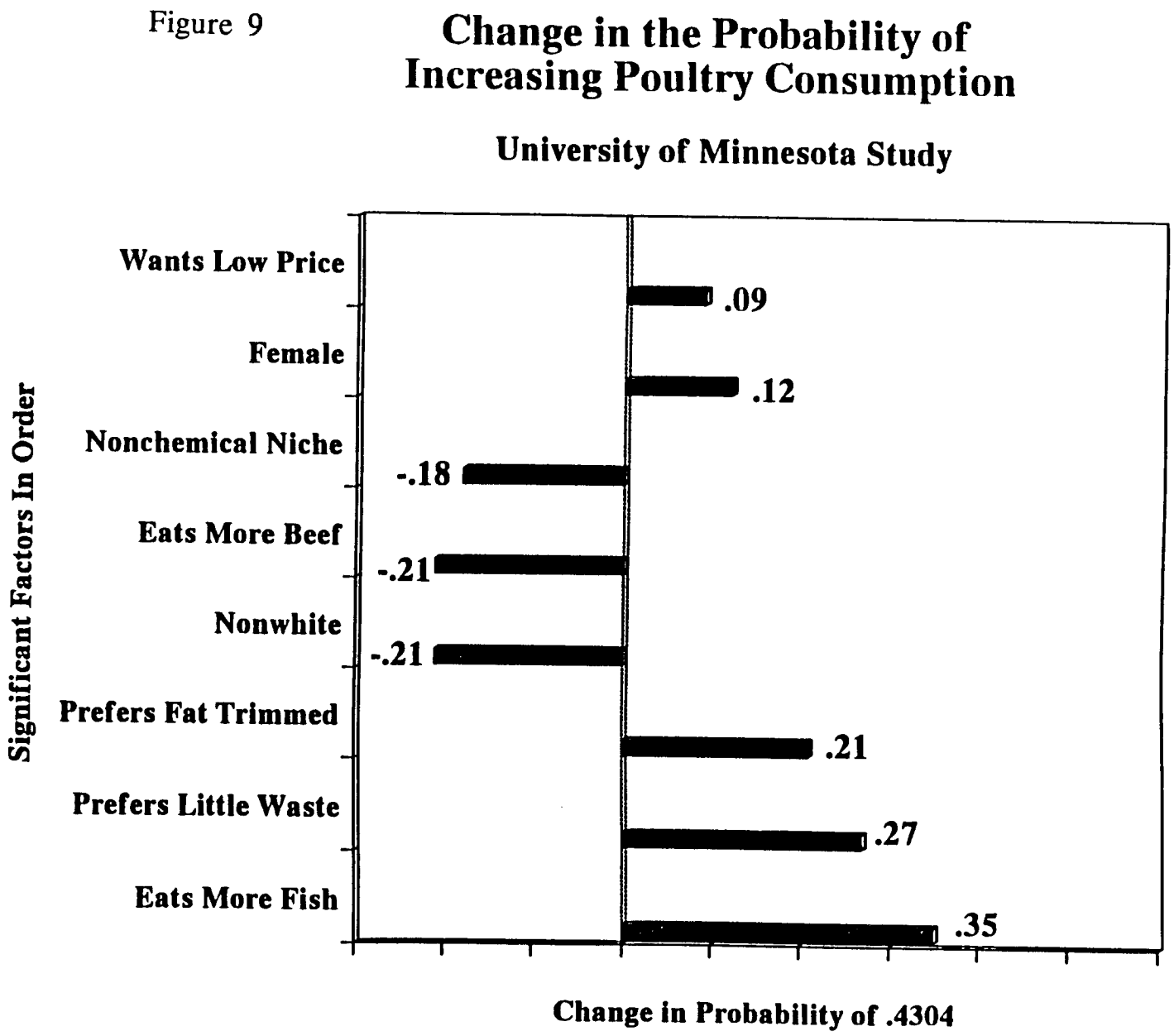

Change in the Probability of Increasing Poultry Consumption
University of Minnesota Study
Significant Factors In Order
Wants Low Price
Female
Nonchemical Niche
Eats More Beef
Nonwhite
Prefers Fat Trimmed
Prefers Little Waste
Eats More Fish
.09
.12
-.18
-.21
-.21
.21
.27
.35
Change in Probability of .4304

Table 17 Probit Estimates of the Probability of Changing Fish and Seafood Consumption

	Decrease Fish	Increase Fish	No change Fish
Overall Probability	0.10	0.22	0.68
Significant Variables	Change in Probability		
NCHEM	0.12	-0.13	0.01
FTRIM	-0.17	0.15	0.01
RECY	-0.12	0.14	-0.02
AGE	-0.004	0.007	-0.003
EDUC	0.01	-0.02	0.007
OTH	0.10	-0.13	0.03
ETH1	0.09	-0.15	0.06
ETH2	0.09	-0.13	0.03
ETH4	0.43	-0.23	-0.2 1
YPOULTRY	0.08	-0.14	0.06

Scottish **(ETH4)** all decreased the probability of increasing fish consumption. Being English, Irish, or Scottish (ETH4) had the greatest impact on fish consumption, decreasing the probability of increasing fish consumption by 0.23 and increasing the probability of decreasing fish consumption by 0.43.

Wanting fat closely trimmed (FTRIM) and preferring packages that are biodegradable or recyclable (RECY) tended to increase fish consumption. The probability of increasing fish consumption increased by 0.15 if FTRIM and 0.14 if RECY.

Those who increased poultry consumption (YPOULTRY) are more likely to have decreased fish consumption. The relationship between fish and poultry is not symmetric

since those who increased their consumption of fish increased the probability of eating more poultry.

Figure 10 illustrates the variables that had a significant impact on the probability of increasing fish consumption, in order of importance.

Eggs

The marginal effects of the variables that were significant in explaining changes in the probability of changing egg consumption are presented in Table 18. The estimated probability of increased egg consumption was 0.04 while the probability of decreased egg consumption was 0.31. There is a .65 probability of no change. Older and higher income people were more likely to decrease their consumption of eggs. Increased income increased the portability of decreasing egg consumption by 0.08. Aging increased the portability of decreasing egg consumption by 0.01. More educated people, on the other hand, were more likely to have increased their consumption of eggs. As the level of education increased (EDUC), the probability of decreasing egg consumption decreased by 0.03.

Those concerned about convenience (NCONV) and not having a lot of waste in food (WASTE) were more likely to increase their consumption of eggs. Being a part time worker (PT), or retired, disabled, unemployed, or a student (OTH) also increased the odds of increasing egg consumption.

Concern about fat and cholesterol (FTCHOL), wanting a variety of foods (VAR), and being European (ETH1), Scandinavian (ETH2), or English, Irish, or Scottish (ETH4) increased the probability of decreasing the consumption of eggs. For example,

Figure 10

Change in the Probability of Increasing Fish Consumption

University of Minnesota Study

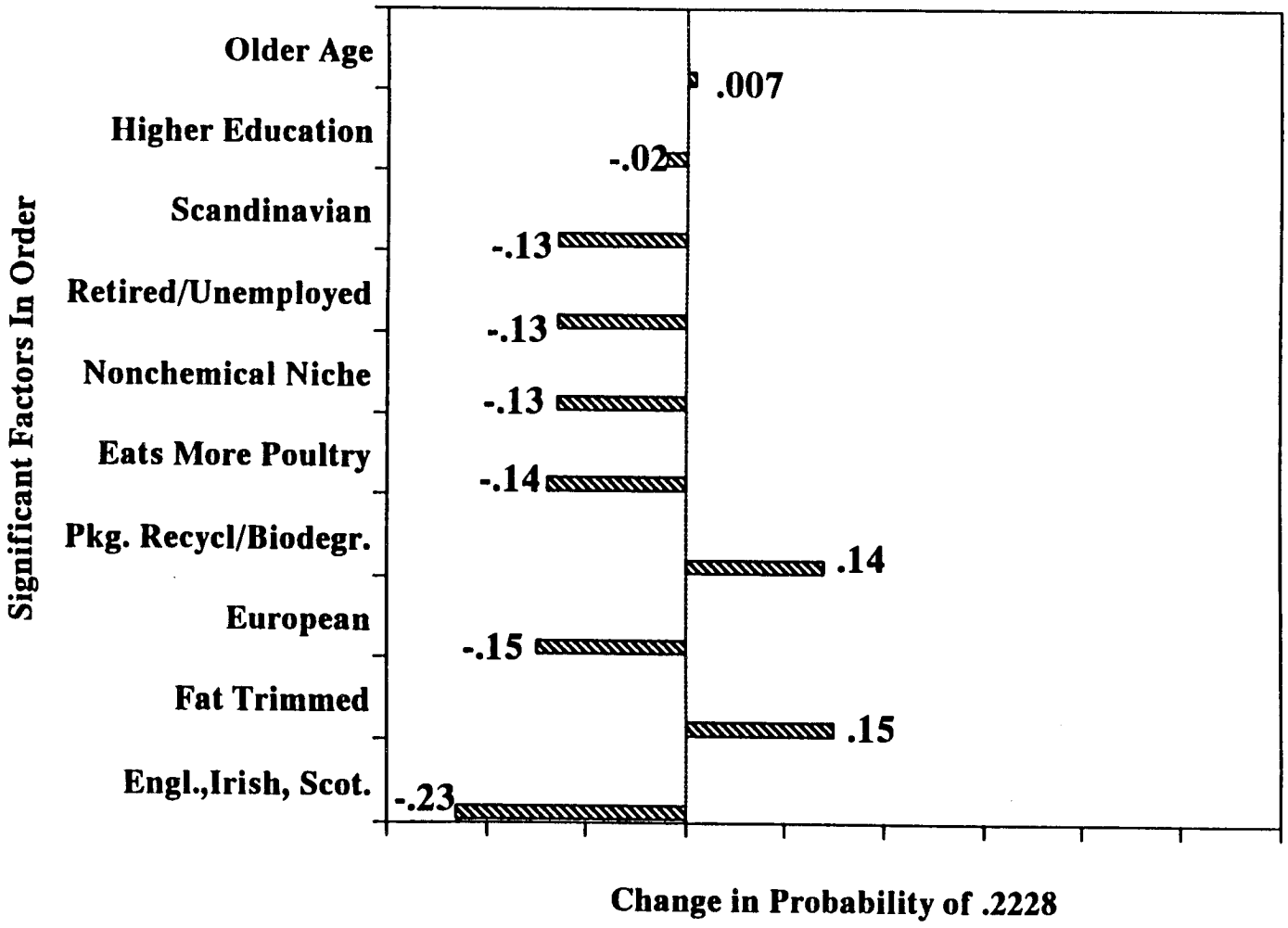


Table 18 Probit Estimates of the Probability of Changing Egg Consumption

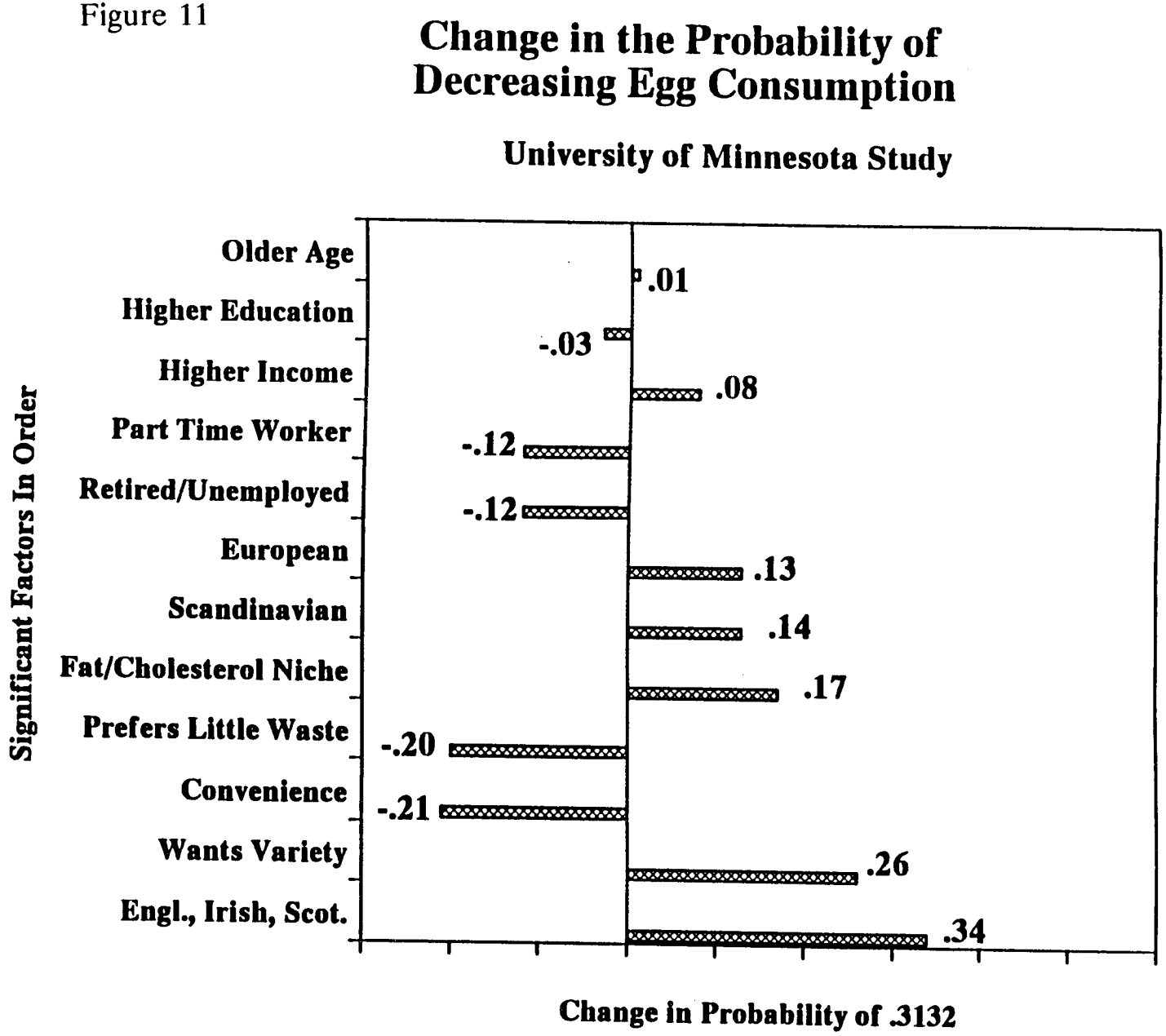
	Decrease Eggs	Increase Eggs	No change Eggs
Overall Probability	0.31	0.04	0.65
Significant Variables	Change in Probability		
FTCHOL	0.17	-0.04	-0.13
VAR	0.26	-0.20	-0.06
NCONV	-0.2 1	0.11	0.10
WASTE	-0.20	0.03	0.17
INCOME	0.08	-0.02	-0.06
AGE	0.01	-0.002	-0.006
EDUC	-0.03	0.007	0.02
PT	-0.12	0.04	0.08
OTH	-0.12	0.04	0.09
ETH1	0.13	-0.03	-0.10
ETH2	0.14	-0.03	-0.11
ETH4	0.34	-0.04	-0.30

belonging to the being in the English, Irish and Scottish ethnic group (ETH4) increased the probability of decreasing egg consumption by 0.34. Being in the niche of people concerned about fat and cholesterol (FTCHOL) increased this probability by 0.17 to a total of 0.48, all other thing being held constant.

Figure 11 illustrates the effect each significant variable had on the change in the probability of decreasing egg consumption in the order of its importance.

One way to summarize the results of these probit analyses is to list the explanatory variables that were significant and to identify what types of animal products are predicted to increase or decrease when the variable is present. For example,

Figure 11


Change in the Probability of Decreasing Egg Consumption
University of Minnesota Study
Significant Factors In Order
Older Age
Higher Education
Higher Income
Part Time Worker
Retired/Unemployed
European
Scandinavian
Fat/Cholesterol Niche
Prefers Little Waste
Convenience
Wants Variety
Engl., Irish, Scot.
.01
-.03
.08
-.12
-.12
.13
.14
.17
-.20
-.21
.26
.34
Change in Probability of .3132

belonging to the niche that is concerned about fat, saturated fat and cholesterol (FTCHOL) significantly explained increasing the probability of decreased consumption of beef and eggs. A shorthand way to say that is to say that belonging to the fat/cholesterol niche tends to decrease the consumption of beef and eggs. Likewise being in the "no chemical" niche (NCHEM) tends to decrease consumption of beef, pork, poultry, and fish. The significant explanatory variables and the direction in which they tended to push the consumption of animal food commodities are presented in Table 19 below.

Table 19 Summary of Significant Factors that Explained a Decrease or Increase in the Consumption of Beef, Pork, Poultry, Fish and Eggs.

Significant Explanatory Factors	Predicted Change in Consumption: Decrease	Increase
FTCHOL: Concern about fat & cholesterol	Beef, Eggs	
NCHEM: Concern about chemicals	Beef, Pork, Poultry, Fish	
FTRIM: Wanting fat trimmed off		Poultry, Fish
LPRICE: Wanting lowest price		Poultry
VAR: Wanting a variety of foods	Eggs	
NCONV: Quest for convenience		Pork, Eggs
WASTE: Preferring little waste	Pork	Beef, Poultry, Eggs
RECY: Wanting biodegradable or recyclable packaging	Beef	Fish
INCOME: Increasing	Beef, Eggs	
SEX: Being female		Pork, Poultry
AGE: Increasing	Eggs	Pork, Fish

Table 19 continued

Significant Explanatory Factors	Predicted Change in Consumption: Decrease	Increase
EDUC: Increasing	Beef, Fish	Eggs
PT Part time work		Eggs
OTH: Retired, Disabled, Unemployed or Student	Fish	Eggs
ETH1: European	Fish, Eggs	
ETH2: Scandinavian	Fish, Eggs	
ETH4: English, Irish, or Scottish	Fish, Eggs	
ETH5: Nonwhites	Poultry	
BEEF: Increasing	Poultry	
POULTRY: Increasing	Beef, Fish	
FISH: Increasing	Beef	Poultry
EGGS: Increasing		Pork

Comments

Certain findings in this survey stand out as being particularly important in affecting consumers' beef purchases. Taste, freshness and leanness appear to have been especially significant. Leanness relates to both a lack of visible fat and overall fat content since most preferred extra lean ground beef. The treatment of animals and the environmental impacts of beef cattle production were not major issues for most people. However, a significant number were very concerned about the use of chemicals in beef production and processing. This concern relates specifically to antibiotics, hormones, and chemical preservatives. A substantial proportion said they simply did not know if they are safe, which suggests some opportunity for education. The beef (and all the meat) industry needs to take these worries very seriously. People want and expect their food to be safe. They want assurances that it is safe.

A significant number said they would be willing to pay as much as $.lO to $.49 per pound more for extra lean beef and beef that is free of antibiotics and growth hormones. This willingness to pay more means there should be an opportunity for expanding profits in the beef industry by responding to these consumer concerns.

The survey responses also imply that antagonism by some in the industry toward government inspection and regulations may be misplaced. Consumers overwhelmingly want good nutritional labels and meat which is USDA inspected and graded. They would also like it to be certified to be free of chemical residues and to come in biodegradable or recyclable packaging. Some major opportunities may be open to the

beef industry by moving toward actively responding to such consumer concerns rather than trying to discount their significance and resisting change.

Attitudes about fat and cholesterol, chemical residues, convenience, waste, variety and recyclable packaging were more important explanatory variables than demographic characteristics with respect to the probability of increasing or decreasing consumption. Some attitudes were correlated with age and income but not strongly. There are few easy-to-identify market niches. As consumers become more informed, their eating patterns change and this change permeates most demographic groups. This reinforces the idea that food marketers must fill the preferences of many types of consumers simultaneously and that large, homogeneous, mass markets for food are dwindling.

REFERENCES

Capps, Oral, Jr., Daniel Moen, and Robert Branson, "Consumer Characteristics Associated with the Selection of Lean Meat Products," *Agribusiness: An International Journal, 4:6(* 1988), 549-557.

Dillman, Don A. *Mail and Telephone Surveys,* New York: John Wiley and Sons, 1978.

Johnson, Steven W. *Meat Preferences Survey: Results and Technical Report,* Technical Report # 93-5 Minneapolis, MN: Minnesota Center for Survey Research, April 2, 1993.

Menkhaus, Dale, Damien Colin, Glenn Whipple, and Ray Field, "The Effects of Perceived Product Attributes on the Perception of Beef," *Agribusiness: An International Journal,* 9:1(1993), 57-63.

Menkhaus, Dale, Pierre Pelzer, Glenn Whipple, and Ray Field, "Factors Influencing Purchasing Patterns for Beef and Other Meats," Mimeographed, Department of Agricultural Economics, University of Wyoming, Laramie, 1992.

Menkhaus, Dale, Robert Pingetzer, Glenn Whipple, and Ray Field, "The Influence of Consumer Concerns and Demographic Factors on Purchasing Patterns for Beef," *Journal of Food Distribution Research,* 21(Sept. 1990), 55-64.

Menkhaus, Dale, Glenn Whipple, Ray Field, and Shawn Moore, "Impact of a Price Premium on Sales of Branded, Low Fat, Fresh Beef," *Agribusiness: An International Journal,* 4:6(1988a), 521-534.

Menkhaus, Dale, Glenn Whipple, Steven Torok, and Ray Field, "Developing a Marketing Strategy for Branded, Low Fat, Fresh Beef," *Agribusiness: An International Journal,* 4:1(1988b), 91-103.

Pelzer, Pierre, Dale Menkhaus, Glenn Whipple, Ray Field, and Shawn Moore, "Factors Influencing Consumer Rankings of Alternative Retail Beef Packages," *Agribusiness: An International Journal,* 7:13(1991), 253-267.

Rifkin, Jeremy, *Beyond Beef: The Rise and Fall of the Cattle Culture,* New York: New York, Dutton, 1992.

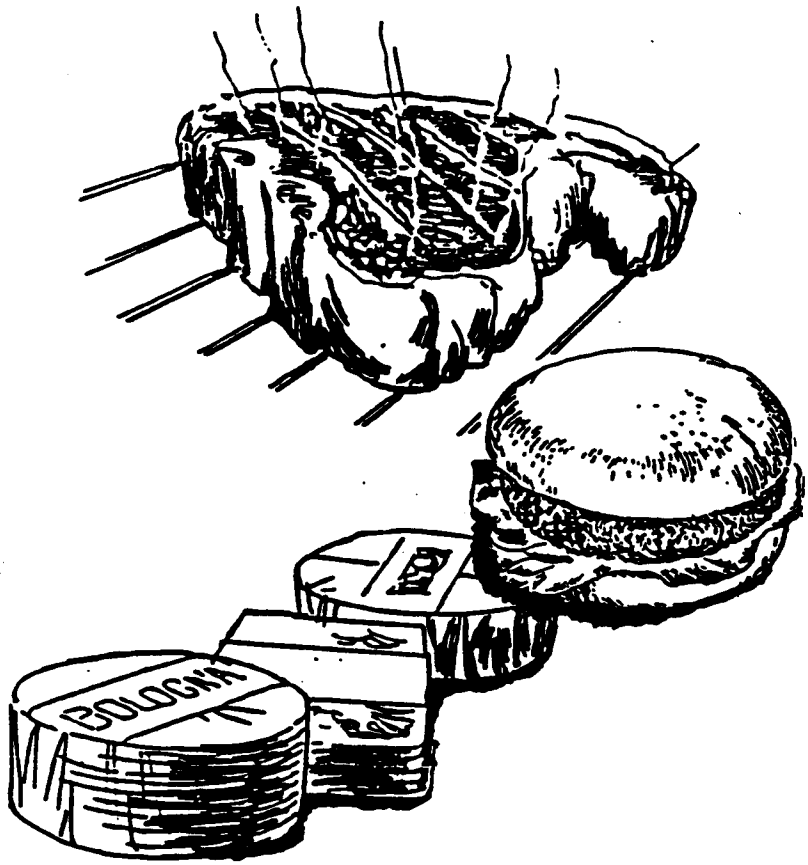
Skaggs, Rhonda, Dale Menkhaus, Steven Torok, and Ray Field, "Test Marketing of Branded, Low Fat, Fresh Beef," *Agribusiness: An International Journal,* 3:3(1987), 257-271.

Senauer, Benjamin, Elaine Asp, and Jean Kinsey, *Food Trends and the Changing Consumer,* St. Paul, MN: Eagan Press, 1991

Tufts University Diet and Nutrition Letter, 11:1, March 1993.

APPENDIX

MEAT PREFERENCES SURVEY



Minnesota Center for Survey Research
University of Minnesota
2122 Riverside Avenue
Minneapolis, Minnesota 55454-1320
627-4282

1-22-93

MEAT PREFERENCES SURVEY

We need your help to find out the kinds of meat Twin Cities' householders prefer. We would like the person in your household who normally does the grocery shopping, or the person who normally prepares the main meal of the day to complete the questionnaire. It is important that only one person complete the questionnaire.

Please write your answer below the question or circle the number which corresponds to the answer closest to your opinion or your current situation. All individual responses will be kept confidential.

Q1. How healthy do you think your diet is, in general? (CIRCLE ONE)

1. Excellent
2. Very Good
3. Good
4. Fair
5. Poor

Q2. Following are some ideas about healthy diets. How important to you personally is it to: (CIRCLE ONE RESPONSE FOR EACH IDEA)

		VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT IMPORTANT	DON'T KNOW
a.	Avoid too much salt or sodium	1	2	3	4
b.	Avoid too much saturated fat	1	2	3	4
c.	Avoid too much sugar	1	2	3	4
d.	Eat a variety of foods	1	2	3	4
e.	Maintain a desirable weight	1	2	3	4
f.	Avoid too much fat	1	2	3	4
g.	Avoid too much cholesterol	1	2	3	4
h.	Eat at least two servings a day of meat, poultry, fish, dry beans, eggs, and nuts	1	2	3	4
i.	Avoid too much iron	1	2	3	4
j.	Take vitamins and/or mineral supplements	1	2	3	4

Q3. The following are factors that may influence your decision to buy or not to buy certain products. Please indicate how important it is to you personally to buy food products that:

		VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT TOO IMPORTANT	DON'T KNOW
a.	Are guaranteed safe to eat	1	2	3	4
b.	Have good nutritional labels on the packaging	1	2	3	4
c.	Are high in nutritional value	1	2	3	4
d.	Are low in calories	1	2	3	4
e.	Taste good	1	2	3	4
f.	Appeal to children	1	2	3	4
g.	Have a brand name	1	2	3	4
h.	You have coupons for	1	2	3	4

Q4. Compared to 12 months ago, has your household's use of the following increased, decreased, or stayed the same? (CIRCLE ONE NUMBER FOR EACH TYPE OF FOOD)

		INCREASED	DECREASED	SAME	NEVER USE
a.	Beef	1	2	3	4
b.	Pork	1	2	3	4
c.	Poultry	1	2	3	4
d.	Eggs	1	2	3	4
e.	Fish and Seafood	1	2	3	4

Q5. Approximately how much per week does your household usually spend for all food items purchased from grocery stores? Include purchases made with food stamps. (CIRCLE ONE)

1. Less than $50 per week
2. Between $50 and $99 per week
3. Between $100 and $149 per week
4. Between $150 and $199
3. $200 or more per week

Q6. In the last seven days, have you eaten a hot take-out meat dish? (For example: hot roasted chicken or hot soup from a supermarket, pizza that was delivered, a hamburger from a fast food restaurant, or a restaurant take-out dish.)

1. Yes ===>
2. No

(IF YES) Think of the last hot take-out meat dish you ate. What type of a store or restaurant did it come from? (CIRCLE ONE)

1. Fast-food restaurant
2. Other restaurant
3. Delivery service (e.g. Pizza Hut)
4. Supermarket or grocery store
5. Delicatessen or gourmet store
6. Convenience store
7. Some other place (PLEASE EXPLAIN)

_____

_____

Q7. What types of main dishes do you most often eat when you eat away from home? A main dish with: (CIRCLE ONE)

1. Steak
2. Roast
3. Hamburger
4. Pork
5. Poultry
6. Seafood
7. Pasta
8. Vegetarian
9. Some other type of food. (PLEASE SPECIFY) _____

Q8. Approximately how many meals do you eat away from home each month?

_____ Breakfasts _____ Noon meals _____ Evening meals

Q9. Now, please think about cooking and preparing meals at home. How often are full meals usually prepared in your home? (CIRCLE ONE)

1. Not at all
2. One to three times a week
3. Three to seven times a week
4. Seven to fifteen times a week
5. Fifteen to twenty-one times a week
6. Twenty-two or more times per week

Q10. In your home, about how much time is usually spent making the main meal of the day?

_____ Hours _____ Minutes

Q11. Please indicate how often you use each of the following methods to cook meat: (CIRCLE ONE ANSWER FOR EACH METHOD)

		MOST OF THE TIME	OCCASIONALLY	RARELY	NEVER
a.	Broil meat	1	2	3	4
b.	Pan-fry meat	1	2	3	4
c.	Cook meat in the oven	1	2	3	4
d.	Cook meat on the stove in a pot	1	2	3	4
e.	Cook meat in the microwave	1	2	3	4
f.	Grill meat	1	2	3	4
g.	Stir fry	1	2	3	4

Q12. How many people are there living in your household, including yourself, that do not eat meat (beef, pork, or lamb)?

_____ people.

IF THERE ARE PEOPLE THAT DO NOT EAT MEAT: What is the main reason for not eating meat? (DESCRIBE IN THE SPACE BELOW)

**For the next few questions, we will be asking about different categories of fresh beef. When thinking about Other Cuts of beef please use the following definition.*

Beef that is not ground but is not either steak or roast: includes stew meat, cubed steak, extra-thin sandwich steaks, beef liver, shish kebab, beef ribs, corned beef, and tongue.

*Q*13. In how many meals during the past 2 weeks was each of these types of fresh beef served as the main dish in your household? Again, we are looking for the number of occasions, not the number of people who ate it. (PLEASE CIRCLE ONE RESPONSE FOR EACH TYPE OF BEEF--IF YOU ARE NOT SURE, CIRCLE YOUR BEST GUESS)

	Number of times served as a main dish in the past two weeks:	NONE	ONCE	TWICE	THREE OR FOUR TIMES	FIVE OR SIX TIMES	SEVEN OR MORE TIMES
a.	Ground Beef	0	1	2	3-4	5-6	7+
b.	Roasts	0	1	2	3-4	5-6	7+
c.	Steaks	0	1	2	3-4	5-6	7+
d.	Other cuts	0	1	2	3-4	5-6	7+

*Q*14. **IF YOU ANSWERED "NONE" FOR ALL TYPES OF BEEF IN Q13: When was the last time these types of beef were served in your household?** (CIRCLE ONE RESPONSE FOR EACH TYPE OF BEEF)

	The last time each type of beef was served as a main dish:	WITHIN PAST MONTH	1 - 2 MONTHS AGO	3 - 6 MONTHS AGO	OVER SIX MONTHS AGO	NEVER SERVED
a.	Ground Beef	PM	1-2	3-6	6+	0
b.	Roasts	PM	1-2	3-6	6+	0
c.	Steaks	PM	1-2	3-6	6+	0
d.	Other cuts	PM	1-2	3-6	6+	0

Q15. The following are factors that may influence your decision to buy or not to buy certain types of meat. Please indicate how important it is to you personally to buy meat that:

		VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT IMPORTANT	DON'T KNOW
a.	Is the lowest price per pound or per ounce	1	2	3	4
b.	Appears fresh	1	2	3	4
c.	Has cooking instructions on the package	1	2	3	4
d.	Is certified as USDA inspected	1	2	3	4
e.	Bears a USDA grade such as choice or prime	1	2	3	4
f.	Is certified free of chemical residues	1	2	3	4
g.	Has different flavorings or seasonings such as Italian, Mexican, or Chinese	1	2	3	4
h.	Is convenient (such as precooked ribs)	1	2	3	4
i.	Is easily stored and keeps well	1	2	3	4
j.	Doesn't have a lot of waste	1	2	3	4
k.	Doesn't take a lot of time to prepare	1	2	3	4
l.	Can be served in a variety of ways	1	2	3	4

Q16. Are there any other factors that have not been mentioned that influence your decision to buy meat? (CIRCLE ONE)

1. Yes ===> What are these factors? (PLEASE DESCRIBE)

2. No

Q17. When you buy fresh meats, poultry, or fish, how often do you freeze these products after bringing them home? (CIRCLE ONE)

0. Do not buy these foods
1. Less than 25% of the time
2. 25 to 49% of the time
3. 50 to 74% of the time
4. 75 to 100% of the time

Q18. Please indicate your preferences toward several characteristics of meat by circling one response for each statement. "Given a choice, I would prefer to buy meat:

		STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE	DON'T KNOW
a.	Already frozen	1	2	3	4	5
b.	In a microwaveable package	1	2	3	4	5
c.	In a biodegradable or recyclable package	1	2	3	4	5
d.	That has most of the visible fat trimmed off	1	2	3	4	5
e.	From animals not treated with growth hormones	1	2	3	4	5
f.	From animals not treated with antibiotics	1	2	3	4	5
g.	That has been de-boned and cut, ready to cook	1	2	3	4	5
h.	Cut into small serving-size pieces	1	2	3	4	5
i.	Not treated with chemical preservatives	1	2	3	4	5
j.	In individually packaged servings	1	2	3	4	5
k.	From animals fed organic feeds	1	2	3	4	5

Q19. Do you eat or prepare ground beef? (CIRCLE ONE)

1. Yes
2. No (SKIP TO QUESTION 22)

Q20. When making hamburgers, what percent fat in the ground beef do you most prefer using? (CIRCLE ONE)

1. Regular ground beef with less than 30% fat
2. Lean ground beef with less than 22% fat
3. Extra lean ground beef less than 15% fat
4. Do not pay attention to fat content
5. Do not know

Q21. Are you willing to pay more, less, or the same for ground beef that is guaranteed extra lean? (CIRCLE ONE)

1. More ===>
2. Less
3. Same

How much more are you willing to pay? (CIRCLE ONE)

1. Less than $0.10 per pound more
2. $0.10 to $0.49 per pound more
3. $0.50 to $1.00 per pound more
4. More than $1.00 per pound

Q22. Leaner beef may result in a tougher, less tasty product. Were you aware of this trade-off before it was mentioned here? (CIRCLE ONE)

1. Yes
2. No

Q23. Now that you are aware of this trade-off, are you willing to pay more, less, or the same for lean beef? (CIRCLE ONE)

0. Do not buy beef
1. More
2. The same
3. Less

Q24. Have you ever tried hamburgers that contain substitutes for fat in them (such as McDonald's McLean Burger)?

1. Yes ===>
2. No

Will you buy one again? (CIRCLE ONE)

1. Yes
2. No

Q25. How likely are you to buy a pre-prepared main dish, such as canned stews or frozen main dishes, that include some type of beef? (CIRCLE ONE)

1. Very likely
2. Somewhat likely
3. Somewhat unlikely
4. Very unlikely

Q26. Are you willing to pay more, the same, or less for already prepared main dishes that include some type of beef, as opposed to buying fresh beef cuts and preparing the main dish yourself? (CIRCLE ONE)

0. Would not buy
1. More
2. The Same
3. Less

Q27. The following are statements about issues concerning the beef cattle industry. Please indicate how you feel about these issues by circling one number for each statement.

		STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE	DON'T KNOW
a.	There should be more monitoring of chemical use in beef cattle production.	1	2	3	4	5
b.	Chemicals used in beef cattle production and processing are safe.	1	2	3	4	5
c.	Beef cattle are treated humanely.	1	2	3	4	5
d.	The production of beef damages the environment.	1	2	3	4	5

Q28. How have your beef purchasing habits changed as a result of recent media stories about the use of antibiotics and growth hormones in beef production? (CIRCLE ONE)

0. Never purchase beef (PLEASE SKIP TO **Q30.**)
1. Purchasing habits not changed
2. Purchase less beef
3. Purchase only residue-free beef
4. Purchase residue-free beef whenever it is available

Q29. How much more are you willing to pay for beef that is free of antibiotics and growth hormones (residue-free)? (CIRCLE ONE)

1. More ===>
2. Less
3. Same

How much more are you willing to pay? (CIRCLE ONE)

1. Less than $0.10 per pound more
2. $0.10 to $0.49 per pound more
3. $0.50 to $1.00 per pound more
4. More than $1.00 per pound

Q30. This set of questions covers food safety. Do you consider the following food processes safe or not safe? (CIRCLE ONE NUMBER FOR EACH PROCESS)

		SAFE	NOT SAFE	DON'T KNOW
a.	Foods that have been treated with radiation	1	2	3
b.	Meat from animals that have been given antibiotics at FDA approved levels	1	2	3
c.	Meat from animals that have been given hormones at FDA approved levels	1	2	3
d.	Foods made at home with raw eggs, such as homemade ice cream, homemade mayonnaise, or caesar salads	1	2	3
e.	Foods that have been treated to be shelf-stable for weeks without refrigeration	1	2	3
f.	Eating raw beef	1	2	3
g.	Meat processed with nitrite	1	2	3
h.	Meat that has been both cooked and refrigerated at the store	1	2	3
i.	Meat that is a product of genetic engineering	1	2	3
j.	Meat processed with additives and preservatives	1	2	3

Q31. How have your beef purchasing habits changed because of recent media information about the treatment of beef cattle in feedlots and in packing plants? (CIRCLE ONE)

0. Never purchase beef
1. Purchasing has not changed
2. Purchasing fewer beef products
3. Purchasing more beef products

This is the last set of questions. They will only be used to categorize your responses. They will not be used to identify you in any way.

Q32. Do you own or rent your home? (CIRCLE ONE)

1. Own
2. Rent

Q33. In what year were you born? 1 ___ ___ ___

Q34. Are you male or female? (CIRCLE ONE)

1. Male
2. Female

Q35. How would you describe your household? (CIRCLE ONE)

1. Married couple with no children
2. Married couple with children
3. Living with partner and no children
4. Living with partner and with children
5. Single with no children
6. Single parent with children

Q36. What is your and your partner's or spouse's occupation?

a. Your Occupation: _____

b. Partner or Spouse's Occupation: _____

Q37. What is the highest grade or year of regular school you and your spouse/partner have attended? (CIRCLE ONE IN EACH COLUMN FOR YOU AND YOUR SPOUSE/PARTNER, IF APPLICABLE)

		YOU	SPOUSE/PARTNER
a.	Less than high school	1	1
b.	Some high school	2	2
c.	High school graduate	3	3
d.	Some technical school	4	4
e.	Technical school graduate	5	5
f.	Some college	6	6
g.	College graduate	7	7
h.	Post graduate or professional degree	8	8
i.	Other (SPECIFY) _____	9	9

Q38. Which of the following best describes your employment status and that of your spouse/partner? (CIRCLE ONE IN EACH COLUMN FOR YOU AND YOUR SPOUSE/PARTNER, IF APPLICABLE)

		YOU	SPOUSE/PARTNER
a.	Employed 40 or more hours per week	1	1
b.	Employed seasonally or less than 40 hours per week	2	2
c.	Retired	3	3
d.	Disabled	4	4
e.	Unemployed	5	5
f.	A full time home maker	6	6
g.	A student	7	7
h.	Other (SPECIFY) _____	8	8

Q39. (IF EMPLOYED) Do you get paid on an hourly or a salaried basis? (CIRCLE ONE)

a. On an hourly basis ==> What is your hourly wage? $_____ per hour

b. On a salary ==> What is your total salary before taxes? $_____ per month or
$_____ per year

Q40. How many people who regularly live in your household are within the following ages?

1. Under 15 years _____
2. 15 to 24 years _____
3. 25 to 44 years _____
4. 45 to 64 years _____
5. 65 years or over _____

Q41. What ethnic group do you identify yourself as belonging to? For example, do you characterize yourself as Hispanic, Scandinavian, German, Hmong, Japanese or some other ethnic group?

Ethnic Group: _____

Q42. What race do you belong to? (CIRCLE ONE)

1. White
2. Black/African American
3. Asian/Pacific Islander
4. American Indian
5. Other (SPECIFY) _____

Q43. What was the total income received in 1991 by all members of this household before taxes? Do not include the value of food stamps or WIC (Women, Infants and Children Program) benefits. Do include salaries and wages, Social Security, other benefit checks. (CIRCLE ONE)

1. Under $10,000
2. Between $10 and $24,999
3. Between $25 and $34,999
4. Between $35 and $49,999
5. Between $50 and $69,999
6. Between $70 and $99,999
7. $100,000 or over

Q44. Please use the space below to tell us about a type of beef product you would most like to see developed and made available in supermarkets Also, write any other comments you may have about beef products. You may use the reverse side of the front cover if you need more space to write.

Thank you for your time and cooperation.
Please return this survey in the enolosed postage paid envelope to:

Minnesota center for survey Research
University of Minnesota
2122 Riverside Avenue
Minneapolis Minnesota 55454-1320
627-4282