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A Cross Sectional Analysis of Consumer Trends in Red Meat Consumption*

by

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Abstract

Food consumption patterns have received considerable attention lately, especially changes in red meat consumption. This article examines and analyzes changes in meat consumption patterns in a southern state. Differences are reported based on demographics and consumer-expressed preferences. The results reaffirm the negative role of health concerns and fat on red meat consumption and the positive influence on poultry and seafood. The findings agree with related other studies and suggest that further research into the changing meat consumption patterns is warranted.

Introduction

In recent years, research associated with food consumption patterns, especially questions in the meat consumption area, have been of interest to retailers, food processors, researchers and others. Following a period of growth in consumption in the seventies resulting from beef herd liquidation, beef consumption has declined,

and other meats have received larger portions of the consumer's food dollar.

Consumers are guided by a number of factors, which differ in quantifiability, in making purchases of specific goods and services. Own price, income and the price of competing goods and services are highly quantifiable factors influencing demand. Also, consumer purchase decisions are influenced greatly by a number of other factors, commonly grouped under tastes and preferences, that are much more difficult to quantify.

Several recent studies have focused on the more quantifiable factors influencing consumption of beef. Several researchers have indicated that the declining demand for beef can be attributed to own-price and income changes (Chavas; Nyankori and Miller), while others report that the demand for beef has changed due to its increased sensitivity to substitute meats (Braschler and Wohlgenant). Less empirical evidence, however, is available exploring the influence of changes in tastes and preferences on beef con-

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sumption.

It does not seem hard to believe that the recent concern about health and physical fitness would have affected consumer purchasing decisions. Fast food establishments now regularly promote alternatives to beef consumption, such as taco salads, fish and chicken sandwiches and other items given the adjective "light." Supermarkets have added salad bars and increased the counter space devoted to poultry and seafood. McCracken and Brandt have explored more closely the changes in away-from-home consumption, how these changes have been affected by household socioeconomic characteristics and the impact that changes in away-from-home consumption have had on product demand through the marketing channel.

Historically, per capita meat consumption has differed regionally within the United States. Using Haidacher, et al., data for 1977-78, beef, pork, and poultry consumption in the South is approximately 97, 118 and 109 percent of the U.S. averages, respectively. Recent research indicates that per capita consumption of beef and pork in Louisiana is nearly equal to the estimates for the South (Schupp and Dennis).

The purpose of this article is to examine the changes in meat consumption patterns associated with households in a southern state. The remainder of the article will focus on consumer-expressed reasons for changing meat consumption patterns, particularly with respect to beef. The latter was analyzed with respect to the demographic characteristics of the household sample as well as the characteristics associated with the packaging and presentation of beef marketed in supermarkets.

The Survey Instrument

Primary data for this study were obtained from a pre-tested questionnaire mailed in late 1986 to 8,000 households in seven Louisiana metropolitan regions selected randomly from a list provided by the Louisiana Department of Motor Vehicles. Approximately 2,100 questionnaires were returned with usable information. Analysis of variance and pairwise comparison methods were used in the analysis of the cross-sectional household data to determine the characteristics of households with similar and dissimilar meat consumption patterns.

Results

Demographic Characteristics

Demographic characteristics of the responding households are summarized in Table 1. The household head was male in 56.6 percent of the responding households as compared to 69.0 percent in the 1980 Census of Population (Louisiana). Females headed 37.4 percent of the surveyed households while 31 percent of households were headed by females in 1980. Distribution of household members by age was quite uniform with from 15.4 to 17.0 percent within the age ranges of 0-17, 18-29, 30-39, 40-49 and 50-59 years. The remaining 19.0 percent were in the 60 years and older category. The number of individuals in the household ranged from 1 to 13 people, with an average of 2.58 persons per household, which compares favorably to an average household size of 2.8 in the 1980 Census. Approximately 62 percent of the households had two or fewer members, while 38 percent had three or more persons residing in the home.

Average annual household income of the respondents was \$32,900. Nearly 40 percent of the respondents had incomes less than \$25,000, 38 percent had incomes between \$25,000 and \$55,000 and 17 percent had incomes greater than \$55,000. In comparison to the Census, the survey revealed fewer households with incomes less than \$15,000 and more households with incomes greater than \$35,000 per year. Blue collar workers made up 17.2 percent of the respondents, white collar workers accounted for 35.5 percent, and the remaining 43.5 percent of the respondents were retired. Since the sample percentage of retired workers was considerably larger than expected for the population, significance tests for the three vocation classes were performed at each level of the demographic characteristics by change in beef consumption pattern (increase, no change, decrease) (Appendix A). There was no definable pattern noted by these tests.

Approximately 87 percent of the respondents were Caucasian (compared to the 1980 Census rate of 66 percent), 10 percent of the respondents were black (compared to 33 percent in the 1980 Census), and 3 percent of the respondents were of a different race or did not respond. Religious preference among the respondents consisted of 33 percent Catholic, 53 percent Protestant, and 11 percent mixed (within a household) religious preference. Seventy-eight percent of the respondents to the survey were native to Louisiana.

Table 1

Socioeconomic Characteristics of the Household Sample, 1986

Characteristic	Household Sample	Characteristic	Household Sample
	----%----		----%----
Head of Household		Household Income	
Male	56.6	< \$15,000	19.2
Female	37.4	\$15,000-\$24,999	20.6
No Response	6.0	\$25,000-\$34,999	16.8
		\$35,000-\$44,999	12.8
Age Distribution of Household Members		\$45,000-\$54,999	8.8
< 18 Years	16.1	≥ \$55,000	17.3
18-29	16.7	No response	4.5
30-39	15.4	Vocation of Household Head	
40-49	15.8	Blue Collar	17.2
50-59	17.0	White Collar	35.5
≥ 60	19.0	Retired	43.5
		No Response	3.8
Number in Household		Religious Preference	
1	13.9	Catholic	33.3
2	48.5	Protestant	52.8
3	18.3	Mixed ^a	11.5
4	10.5	No Response	2.4
> 4	8.8		
Race		Native of Louisiana	
Caucasian	87.2	Yes	78.0
Black	9.6	No	21.5
Others	1.6	No Response	.5
No Response	1.6		

^aHusband and wife differed within the household.

Consumption Patterns

The respondents were asked to indicate whether their beef consumption had increased, decreased or remained unchanged over the most recent five-year period. Only 8.4 percent reported higher beef consumption, 35.3 percent indicated no change in the amount of beef consumed and the remaining 56.3 percent reported decreased beef consumption. The influence of selected socioeconomic characteristics on changes in household beef consumption over the last five years is given in Table 2. (See also Appendix A for a further explanation of the effects of the vocation variable.) Household size was shown to have a statistically significant impact on whether the household had decreased beef consumption over the last five years. The

larger the household the less likely the household was to have decreased beef consumption and the smaller the decrease. The number of individuals in the household, however, did not explain differences among households in the rate of increase in beef consumption.

Beef consumption in a female-headed household was found to be reduced significantly compared with consumption in households headed by males. Households headed by a female also showed greater increases in beef consumption, but the difference was not significant. The presence of children in the household was expected to significantly increase the household's beef consumption. However, the presence of children under the age of 18 years in the house-

Table 2
Mean Percentage Change in Household Beef Consumption
By Socioeconomic Characteristic,
Most Recent Five-Year Period,
Household Sample, 1986

Socioeconomic Characteristic	Change in Beef Consumption	
	Increase	Decrease
	-----%-----	
Number in Household		
1	25.56	45.15 ^{AB}
2	29.77	*37.20 ^{AC}
≥ 3	25.66	32.86 ^{BC}
Sex of Household Head		
Male	26.04	35.22 ^A
Female	30.60	*39.18 ^A
Children < 18 Years of Age		
No	29.92	36.11
Yes	24.11	32.70
Vocation of Household Head		
Blue Collar	30.10	33.21 ^{AB}
White Collar	23.71	37.58 ^A
Retired	28.41	37.41 ^B
Household Income		
< \$15,000	32.18 ^{AB}	38.29 ^A
\$15,000-\$24,999	31.58 ^{CD}	36.54
\$25,000-\$34,999	24.45	38.10 ^B
\$35,000-\$44,999	*17.50 ^{BD}	32.68 ^{ABC}
\$45,000-\$54,999	28.50	35.54
≥ \$55,000	17.81 ^{AC}	37.74 ^C
Race		
Caucasian	24.15 ^A	37.03
Black	*34.39 ^A	33.97
Other	15.00	35.07
Religion		
Catholic	25.75	38.10
Protestant	26.66	36.05
Mixed ^a	32.38	35.45
Native of Louisiana		
No	27.79	36.78
Yes	24.78	36.15

* Significant differences among characteristics within a category using an F statistic (.10 level or less).

^{ABCD} Corresponding superscripted letters placed by percentages indicate significant pairwise differences within a category ($\alpha = .10$ level).

^a Husband and wife differed within the household.

hold showed no significant impact on the decision to increase or decrease beef consumption.

Vocation of the family head appeared to have an influence on the household's decision to decrease beef consumption over the last five years. Households headed by a blue collar worker decreased beef consumption less severely than did the remaining households. However, the decision of households to increase beef consumption over the same period was unaffected by vocation of the family head, even though there was a tendency for white collar households to have smaller increases in beef consumption.

Among households reporting decreased beef consumption, the decreases were largest among households with incomes less than \$15,000, with incomes between \$25,000 and \$35,000 and with incomes greater than \$55,000. The decrease in beef consumption was lowest for households with incomes between \$35,000 and \$45,000. For those households reporting increased beef consumption, the increases were smallest among the \$35,000 to \$45,000 and over \$55,000 income groups. The two lowest income groups reported the largest increases in consumption.

Caucasian households tended to decrease beef consumption more severely than did black households and to increase consumption on average less than black households did. The difference in consumption increases among Caucasian and black households was significant in our study, a finding that agrees with earlier work by McCracken.

Religious preferences and whether the respondent was a native or non-native of Louisiana did not play a significant role in determining whether households would increase or decrease beef consumption.

Away-from-home beef consumption among respondents increased significantly less than at-home consumption over the most recent five-year period. While increases averaged 27.9 percent for at-home consumption, the average away-from-home consumption was 16.9 percent. The average decreases for at-home and away-from-home consumption were not significantly different.

Reasons for Consumption Changes

Survey respondents reporting lower beef consumption over the past five years also ranked, in order of importance, seven specific reasons for their decrease in beef consumption

(Table 3). One reason stood out over the others, with nearly six times as many respondents ranking "concern with beef's influence on health and well being" as the number one cause of reduced beef consumption than the next closest reason. The second most important reason, "beef cuts are too fat," is often linked with the reason rated most important. The third and fourth reasons, "beef's price relative to other meats" and "consumption has declined due to the increasing age of members in the households," respectively, were ranked very close, with both being slightly below the second most important reason. The fifth, sixth and seventh ranked reasons were considerably less important to the respondents of the survey as indicated in Table 3.

Households decreasing beef consumption over the past five years either substituted other meats for beef or made other dietary changes. Households substituting other meats were asked to allocate, in percentage terms, the gaining meats. The biggest gainer was chicken (30.7%), followed by seafood (21.9%), nonspecific meats (14.5%), turkey (12.5%), pork (11.9%), lamb and mutton (8.5%). The differences in the gaining categories indicate the diverse interests of the household sample. A portion of the large increase in the seafood component may be attributable to the state's close proximity to the Gulf of Mexico and to the cultural uniqueness associated with many regions of Louisiana.

Following identification of the gaining meats, the respondents were asked to rank four reasons for choosing to substitute pork, poultry, or seafood for beef. Poultry and seafood were substituted most frequently for reasons of health (Table 4). Price rated second for poultry followed by tastes and preferences and convenience in preparation. Tastes and preferences rated second for seafood, followed by convenience in preparation and price. The most important reasons for substituting pork for beef were tastes and preferences, followed by price, health concerns and then by convenience in preparation.

Satisfaction with Retail Meat Marketings

An important factor influencing consumer meat purchasing decisions is the retailer's packaging and presentation of the product in the meat case. Attractive presentation and appropriate packaging often stimulate consumer purchases. On the other hand, improper packaging and a disorganized meat case can discourage meat purchases. The respondents were given an opportunity to check several items related to point-of-purchase presentation that discouraged

Table 3

**Reasons for Decreased Beef Consumption, Most Recent Five-Year Period,
Household Sample, 1986**

Reason for Decline	Weighted Ranking^a
Concern with beef's influence on health and well being	1.23
Beef cuts too fat	1.67
Beef's price relative to other meats	2.11
Consumption of beef has declined with age of household members	2.14
Beef's taste and tenderness have declined	3.27
Beef's inconvenience for home preparation	4.65
Concern with animal welfare issue	4.86

^aResponding households ranked the seven reasons for importance with 1 as most important. Weighted ranking was obtained by multiplying rankings by number of observations, summing and dividing by the total number of observations.

Table 4

**Reasons for Substitution of Pork, Poultry and Seafood for Beef Consumption,
Most Recent Five-Year Period, Household Sample, 1986**

Reason for Substitution	Pork	Meat	
		Poultry	Seafood
	-----Weighted Ranking^a-----		
Price	1.78	1.57	3.31
Convenience in Preparation	3.61	2.11	2.25
Health Concerns	1.95	1.21	1.21
Taste and Preferences	1.32	1.85	1.36

^aResponding households ranked the four reasons for importance with 1 as most important. Weighted ranking was obtained by multiplying rankings by number of observations, summing and dividing by the total number of observations.

Table 5

**Respondent Appraisal of Packaging and Presentation Problems
In the Supermarket, Household Sample, 1986**

Evaluation Item	Percent of Households Checking^a
Package Sizes Too Large	22.9
Cuts Within Packages Too Large	15.2
Packaging Conceals Less Desirable Cuts or Parts of Cuts	68.6
Packages Should Not Leak Liquids	63.0
Packages Should Have Cooking Suggestions	19.4
Packaging Should Be Done At Packer Level	7.4

^aRespondents were asked to check which of these items they perceived to be a problem in packaging or presentation at the supermarket (the percentage is based on number of checks/total number of surveys).

purchase of beef.

Since many respondents gave multiple responses to this portion of the questionnaire, a percentage based on total responses was determined for each reason (Table 5). Two of the items listed were perceived as problems by over half of the respondents. "Packaging concealing less desirable cuts or parts of cuts" was checked by 68.6 percent of the respondents while 63.0 percent of the respondents checked "leaky packaging." Other items checked by 15 percent or more of the respondents were: "package sizes too large" (22.9%), "lack of cooking suggestions" (19.4%), and "the cuts in packages are too large" (15.2%). Surprisingly, 7.4 percent of the respondents felt that packaging should be performed by the meat packer rather than the retailer.

Conclusions

The results of the survey tend to agree with previously published studies concerning changes in beef consumption. Findings from the consumer studies have been highly consistent indicating that the demand for beef declined after the mid 1970s. This decline has been associated with several causes, including own-price and income changes, price of beef relative to substitute meats and changes in other factors, which are commonly grouped under tastes and preferences.

In general, the socioeconomic household variables (such as age, income, race, religion, and vocation) did not explain much of the variation in beef consumption among the responding households. Although significant differences were noted, there do not appear to be any clear and definable patterns to the changes based on socioeconomic characteristics. Vocation of household head, race and household income appear to be the most important of the variables analyzed.

For this sample, health concerns appear to be the most important reason associated with the decline in beef consumption in Louisiana households. Consistent with the health issue, the second most important issue was the fat content of the meat portion. One of the more important reasons given in the survey for decreased beef consumption was the departure of children and the overall aging of other household members. If this survey is a good indicator of future change, then the beef industry may continue to encounter further declines in demand as the average age of the population continues to increase.

Apparently, retail meat packaging is still a source of complaint for the consumer. Retailer packaging that "hides the less desirable cut or portion of the cut" is considered a deception. Leaky packages continue to plague retailers even though solutions are available. Removal of the other cited consumer complaints--reducing cut size within the package, reducing the package size and providing recommended cooking suggestions--may be ways for the retail food industry to be viewed more favorably by the consumer.

Finally, this study supplements other recent work in the area of consumer demand. This study provides insight into consumer reasons for decreasing beef consumption over the past five years, specifies the meats that have gained consumption from beef's decline, indicates why given meats have been substituted for beef and analyzes consumer assessment of current supermarket beef offerings. The findings suggest that further research into the area of changing consumer consumption patterns is relevant. Additionally, it indicates that adequate changes may not have been made at the retail level to meet the changing demands of consumers.

References

- Braschler, Curtis. (1983). "The Changing Demand Structure for Pork and Beef in the 1970's: Implications for the 1980's," *Southern Journal of Agricultural Economics*, (December) 105-110.
- Chavas, Jean-Paul. (1983). "Structural Change in the Demand for Meat," *American Journal of Agricultural Economics*, 65 (February) 148-153.
- Haidacher, Richard C., John A. Craver, Kuo S. Huang, David M. Smallwood and James R. Blaylock. (1982). "Consumer Demand for Red Meats, Poultry, and Fish," NED, ERS, USDA, AGFS 820818, p. 34.
- McCracken, Vicki A. (1986). "The Importance of Demographic Variables on the Probability of Consuming Meat Away-From-Home." Presented Paper, Demand Symposium, Charleston, South Carolina, Oct. 20-21.
- McCracken, Vicki A. and Jon A. Brandt. (1987). "Household Consumption of Food Away From Home: Total Expenditure and by Type of Food Facility," *American Journal*

of Agricultural Economics, 69 (May) 274-284.

Nyankori, J. C. O. and G. H. Miller. (1982). "Some Evidence and Implications of Structural Change in Retail Demand for Meats," *Southern Journal of Agricultural Economics*, (December) 65-70.

Schupp, Alvin and Winston Dennis. (1987). "Estimation of Beef and Pork Consumption," *Louisiana Rural Economist*, Louisiana State University, Vol. 49, No. 3, pp. 2-4.

U.S. Department of Commerce, Bureau of the Census. (1983). "1980 Census of Population, Characteristics of the Population, Detailed Population Characteristics Louisiana," PC80-1-D20.

Wohlgenant, Michael K. (1986). "Effects of the Changing Composition of Beef Consumption on the Elasticities for Beef and Poultry." Presented Paper, Demand Symposium, Charleston, South Carolina, Oct. 20-21.

Appendix Table A.

Mean Percentage Change in Household Beef Consumption
By Socioeconomic Characteristic and Vocation,
Most Recent Five-Year Period, Household Sample, 1986

Socioeconomic Characteristics	Blue Collar		White Collar		Retired	
	Increase	Decrease	Increase	Decrease	Increase	Decrease
Number in Household						
1	10.03	50.45 ^{AB}	26.67	44.13 ^A	22.50	44.72 ^{AB}
2	27.81	*34.41 ^A	27.71	*40.13	29.05	*36.58 ^A
≥ 3	36.33	29.43 ^B	21.61	34.27 ^{AB}	29.00	31.62 ^B
Sex of Household Head						
Male	29.29	32.55	22.82	35.68 ^A	27.68	35.30 ^A
Female	32.35	34.64	27.00	40.14 ^A	32.17	*40.93 ^A
Children < 18 Years of Age						
No	30.57	33.72	*30.14 ^A	39.62 ^A	28.63	37.55
Yes	29.56	31.79	*18.70 ^A	32.81 ^A	26.25	33.87
Household Income						
< \$15,000	30.00	29.60	34.29	34.95	43.10 ^{AB}	42.56 ^{ABC}
\$15,000-\$24,999	40.15 ^{AB}	38.66 ^A	25.00	40.15	25.20 ^A	34.67 ^{ADH}
\$25,000-\$34,999	*27.54	38.96 ^B	21.54	35.00	24.00	*42.00 ^{DEF}
\$35,000-\$44,999	12.40 ^A	25.26 ^{AB}	18.00	35.42	20.00	31.48 ^{BE}
\$45,000-\$54,999	6.50 ^B	35.38	35.00	39.61	40.00	23.50 ^{CFGH}
≥ \$55,000	--	27.94	18.64	38.64	16.00 ^B	38.25 ^G
Race						
Caucasian	27.12	33.80	21.57 ^A	37.70	23.15 ^A	37.62
Black	34.64	32.22	*46.00 ^{AB}	38.68	37.21 ^A	35.00
Other	--	10.50	12.50 ^B	35.00	20.00	48.33
Religion						
Catholic	30.00	37.15 ^A	26.00	39.37	25.00	38.29
Non Catholic	25.16 ^A	29.57 ^A	*19.08 ^A	36.66	33.75 ^A	37.51
Mixed	44.28 ^A	29.00	39.16 ^A	37.11	8.25 ^A	35.99
Native of Louisiana						
No	29.42	31.57	23.85	32.76 ^A	16.67	40.29
Yes	30.33	33.45	23.66	39.32 ^A	30.36	36.60

*Significant differences for an F statistic (.10 level or less).

ABCEFGH Corresponding superscripted letters placed by percentages indicate significant pairwise differences ($\alpha = .10$ level).