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Consumer Awareness and Use of Nutrition Labels on Packaged Fresh Meats: A Pilot Study

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The Nutrition Labeling and Education Act of 1990 called for the voluntary nutrition labeling of packaged fresh meats in retail stores. The stores had until mid-1994 to meet the Act's provisions. Availability and use of these labels in Louisiana retail stores were examined by a 1997 survey of households. One-half of the responding households perceived that these nutrition labels were in use in stores, and when available, they were used by most respondents. The primary reasons for nonuse include sufficient prior knowledge of nutrient content, insufficient shopping time to check labels, and lack of interest in nutrient content. Family income, household head retired, and interest in preparing healthy meals in the home were statistically significant variables in explaining label readership.

Introduction

Consumers have a number of reasons for paying attention to personal and family nutrition. In our youth-oriented society, physical appearance is important to many and will continue to be important with the aging of the "baby boomers" (Chernoff, 1995). Control of nutrient intake is often useful in preventing obesity and enhancing body condition (American Dietetic Association, 1997a). Numerous studies have targeted consumers with the health message that reducing dietary intake of particular nutrients (such as fat and cholesterol) will help decrease their risk of contracting disease (Van Horn et al., 1995).

The U.S. Department of Agriculture and numerous other public and private groups have encouraged consumers to learn more about the nutritional content of the foods that they consume both inside and outside the home. The Nutrition Labeling and Education Act (NLEA), passed by Congress in 1990, required that all processed foods be labeled as to their nutritional composition (Caswell, 1992). While the NLEA called for a standardized label format for all processed food products, knowledge and use of nutrition information on packaged processed foods have differed among consumers. The specific health concerns of individual consumers have largely de-

finied nutrition label use for processed foods, especially as related to content of fat, cholesterol and total calories (Morreale and Schwartz, 1995). The authors contend that the primary users of these labels are consumers who have concern with their health or diet (Guthrie et al., 1995).

Prior to the NLEA, packaged fresh meats sold in retail stores were not required to be nutrition-labeled, nor was nutrition information required to be available on these meats in the store. Large variation in the fat content of fresh meats, especially of red meats, made it difficult to provide reasonably accurate nutrition information on cuts of these meats. Fortunately, the meat industries (beef, pork, broiler, and turkey) have recently reduced the variation in the fat level (and, in some cases, cholesterol) of packaged fresh meat cuts through changes in breeding, feeding, management, and processing (Frazao, 1994). The NLEA established a requirement for food stores to voluntarily provide nutrition labels on packaged fresh meats or to make available point-of-sale nutrition information on fresh meat cuts. If the rate of voluntary compliance is deemed inadequate, provisions within the Act require mandatory labeling of fresh meats. The portion of the NLEA involving fresh meats went into effect in mid-1994. Since the NLEA gave food stores the option of using point-of-purchase nutrition information or nutrition labels, the stores could begin nutrition labeling of packaged fresh meats on a pilot basis while providing point-of-purchase nutrition information on all fresh meat cuts.

In this study, consumer awareness of and use of nutrition labels on packaged fresh meats—with nutrition labeling defined as under the NLEA—are estimated. Though previous studies have examined the knowledge and use of labels on processed meats

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(Piedra, Schupp, and Montgomery, 1996), the authors are unaware of any previous estimates of the availability of nutrition labels on packaged fresh meats or of consumers reading these labels during the shopping experience.

Of what value is information on consumer awareness and use of nutrition labels on fresh meats? Nutrition information is useful to consumers with health problems, those with specific dietary goals, and consumers wishing to be recognized as progressive in food selection and consumption. While these groups may be difficult for the seller to target for promotional purposes, consumers having demographic characteristics associated with interest in nutrition labels can be targeted. Sellers of fresh meats having less desirable nutritive content would likely favor nonuse of these labels. Since the NLEA gives the retailer the option of using either labels or point-of-sale nutrition information, the seller can use labels on fresh products with more desirable nutrient content and point-of-sale nutrient information on the remaining fresh meat products.

Objectives

The objectives of the study are:

- a. to estimate consumer awareness and use of nutrition labels on packaged fresh meats by selected socioeconomic characteristics of households.
- b. to ascertain reasons for consumers choosing not to read nutrition labels when available on packaged fresh meats.

Completion of these objectives will provide information that retailers can use in choosing whether to begin or expand the nutrition labeling of packaged fresh meats in their outlets. The study will identify the socioeconomic characteristics of consumers who are readers of nutrition labels on fresh meats as well as those who do not read these labels.

Data and Procedures

The names and addresses of 3,180 randomly selected Louisiana households were obtained from the Motor Vehicle Registration Division of the Louisiana Department of Public Safety. These households were located in eight randomly selected rural and urban parishes. The questionnaire used in the household mailout was developed and tested,

revised based on feedback, and then mailed to the households in May 1997. A specific procedure designed to encourage an appropriate and positive response by those sampled was used in designing the questionnaire and in conducting the mailout (Dillman, 1978). A cover letter requested that the dominant food shopper complete the form. A total of 617 returns were received, approximately 20 percent of the mailout. The telephone numbers of the 3,180 households were not available to follow up on the representativeness of the responding sample.

The survey data were analyzed using logit and tabular analysis. Following Judge et al. (1988), binary choice models can be used to model the choice behavior of individuals when two alternatives are available and one must be chosen. Since the logit is inherently heteroskedastic, the most suitable technique for estimating the logit model is maximum likelihood. It also assures the large-sample properties of consistency and asymptotic normality of the parameter estimates (Capps and Kramer, 1985).

The maximum likelihood coefficients estimated through logit have no direct interpretation, other than indicating a direction of influence on probability. Instead, the user often turns to the calculated changes in probabilities, which indicate the magnitude of the marginal effects (Maddala, 1988). Changes in probability refer to the partial derivatives of the nonlinear probability function evaluated at the zero and one values of the independent variables (Pindyck and Rubinfeld, 1991).

The dependent variable used in the logit analysis was based on the question, "Do you usually read the information on nutrition labels of fresh meats at the grocery store?". As requested on the questionnaire, the only respondents to the readership question were those who reported that their favorite store was using nutrition labels on fresh meats. Respondents who reported being unsure if nutrition labels on fresh meats were in use in their favorite store or being sure that their favorite store was not using nutrition labels on fresh meats did not respond to the readership question. Independent variables used in the logit analysis included the sex, age, education, and race of the respondent, the respondent was retired, the respondent was a homemaker, the household was located in a city, the household was located in a town, family income, children present in the household, the household head was single, and whether the

food preparer attempted to control the content of fat, cholesterol, and total calories in household meals for health reasons. The latter variable indicates whether the household food preparer chose the types and quantities of food needed in meals to achieve a nutritional and healthy diet. All of the variables, except the last one, are traditionally used in household food consumption research. These variables have been shown to be associated with the respondent's decision-making process and are useful in targeting specific market segments.

Label readership was expected to be higher among respondents with a college degree than among those without a college degree (Piedra, Schupp, and Montgomery, 1996; Schultz, 1975). Label use was also expected to increase with family income (based on previous research of nutrition label use on processed meats (Piedra, Schupp, and Montgomery, 1996; Guthrie et al., 1995)). Label use was expected to be higher among females (Food Marketing Institute, 1990; Nayga, 1996). Initially, older respondents were expected to be more likely to read nutrition labels due to health concern with cholesterol and fat (Grossman, 1972). On the other hand, older respondents may be more informed about nutrition due to past experience. Guthrie et al. (1995), and Bender and Derby (1995) failed to show increased label reading with increased age. Therefore, the expected sign of the age variable was indeterminate.

Households with children present were expected to be more likely to read labels since the health of children was expected to be a primary concern of a household. It was also initially assumed that, in cases in which the respondent was a homemaker, label reading would be more prevalent due to the emphasis in these households on meal preparation (Guthrie et al., 1995; Douglas, 1976). On the other hand, homemakers may already know about the nutrient content of fresh meats and may not need to read labels. Therefore, the sign of the homemaker variable was considered indeterminate. Retired persons would also be more likely to read labels due to the availability of time to concentrate on health issues as they relate to their mortality. In the case in which the respondent was single without children, label reading was expected to be lower as the individual has the responsibility only for his/her well-being. Label use was expected to be higher among households in which the meal planner attempts to control fat, cholesterol, and calorie intake in meals

served in the home. Other variables considered to be indeterminate in sign were race and whether the household was located in a rural area, town, or city (even though media exposure is greater in populated areas (Putler and Frazao, 1994)).

Results

Descriptive statistics for the responding households are given in Table 1. The actual sample is somewhat biased toward the higher educated, higher income population segments (as also encountered by Piedra, Schupp, and Montgomery, 1996; Nayga, 1996). Whereas 95 percent of respondents had a high school or higher education, 68 percent of Louisiana residents have a high school education or higher. Approximately 68 percent of Louisiana residents are white whereas 85 percent of the respondents were white. Approximately one-half of the respondents had family incomes exceeding \$30,000 while the median family income in the state is \$25,500 (Louisiana State Census Data Center, 1998). Previous research indicates that households with the sample demographic characteristics represent the most likely users of nutrition labels on processed meats (Piedra, Schupp, and Montgomery, 1996).

While voluntary nutrition labeling of fresh meats had begun only three years prior to the time of the survey, more than one-half of the responding households indicated that these labels were available on packaged fresh meats in their favorite store (Table 2). Another 21 percent were unsure whether these package labels were in use in the store that they patronized regularly. The remaining 26 percent had not seen nutrition labels on fresh meat in their food stores. Since the questionnaire did not ask the respondent to identify their favorite stores, their perceptions of the use of nutrition labels remain unverified.

More than 78 percent of those respondents reporting nutrition-label use in their store said that they read the labels (Table 2). The percentage of label readers was higher than expected. Several respondents, however, complained that the labels were on ground meat only and that the labels provided information only on fat content.

Based on preliminary analyses, some categories in a number of the independent variables used in the logit analysis (Table 1) were combined when statistical and operational information justified their combination. The logit analysis tended to confirm the newness of the availability of nutrition labels on

Table 1. Descriptive Statistics of Sample, Total, and Non-readers, Fresh Meat Nutrition Study, Louisiana, 1997.

Characteristic	Percentage	
	Total Sample	Non-label Readers
Respondent is food buyer	89.75	86.15
Respondent is a female	71.17	66.67
Average age (Years)	48.99	48.41
Respondent is single adult	16.38	19.05
Single parent with children	6.76	3.17
Couple with no children	38.18	31.75
Couple with children	38.68	46.03
Less than high school education	4.80	3.03
High school education	31.11	30.30
Trade school education	8.11	9.09
Some college	29.47	30.30
College degree	16.23	16.67
Postgraduate work	10.26	10.61
Respondent employed	53.06	56.06
Respondent unemployed	2.15	0.00
Respondent is homemaker	18.84	19.70
Respondent is retired	23.47	21.21
Respondent is student	2.48	3.03
Respondent is Asian	1.18	1.54
Respondent is Black	12.29	9.23
Respondent is Hispanic	1.68	3.08
Respondent is Caucasian	84.85	86.15
Located in rural area	15.15	27.69
Located in town (500–2,500)	13.22	10.77
Located in larger town (2,500–25,000)	11.90	13.85
Located in small city (25,000–100,000)	10.41	12.31
Located in medium city (100,000–500,000)	26.94	27.69
Located in large city (>500,000)	10.08	7.69
Income <\$15,000	17.98	16.67
Income (\$15,000–29,999)	22.38	20.00
Income (\$30,000–44,999)	22.20	16.67
Income (\$45,000–59,999)	15.78	16.67
Income (\$60,000–74,999)	11.01	15.00
Income (\$75,000–90,000)	5.14	6.67
Income >\$90,000	5.50	8.33

Table 2. Responses to "Nutrition Labels are Available on Packaged Fresh Meats in My Grocery Store" and "I Read These Nutrition Labels," Fresh Meat Nutrition Study, Louisiana, 1997.

Statement	Number Responding	Percentage
Are nutrition labels present?		
Yes	316	52.5
Don't know	131	21.0
No	161	26.5
Total	608	100.0
Do I read these labels?		
Yes	245	78.5
No	67	21.5
Total	312	100.0

fresh meat packages (Table 3). Only three of the independent variables were statistically significant at the 0.10 level. Respondents who attempted to control the daily availability of fat, cholesterol, and calories in meals served in the home were more likely to read nutrition labels on packaged fresh meats than those who did not. As expected, retired household heads were more likely to read nutrition labels than others. Respondents of households with family incomes of \$60,000 and higher were less likely to read labels. Given that the Meal variable was likely endogenous, the model was rerun with it omitted. The results were essentially unchanged, so the statistical results of the modified model are not presented.

The marginal probabilities for the significant variables are presented in Table 3. The percentage of correct predictions was 79.2.

The descriptive statistics of respondents who ignored the nutrition labels on packaged fresh meats are presented in Table 1. This group differed little from the overall sample, with the possible exception of having a larger percentage of households in rural areas. Of those choosing not to read nutrition labels on fresh meat, 31 percent indicated that they were familiar with the nutritive value of fresh meats and that they did not need to consult labels (Table 4). One-fourth of the respondents did not read labels because they felt that they did not have time to read them during the shopping experience. Another 20 percent did not have enough interest in the nutritional value of fresh meats to consult the labels. Only 5 percent indicated that difficulty with the design and content of the labels prevented them from reading them.

Implications

Consumer perceptions of the availability of nutrition labels on packaged fresh meats in food stores may be greater than the actual use of such labels in stores. Many food retailers have placed nutrition labels on ground meat but not on the remaining fresh meat cuts. The important point is that one-half of the households responding to the survey *perceive* that nutrition labels are available on packaged fresh meats in their stores.

The high rate of reading nutrition labels on packaged fresh meats, among those who are aware of the labels, is likely indicative of interest in the content of specific nutrients in these products. Those who choose to provide daily meals in the home with healthy quantities of fat and cholesterol were more likely to read nutrition labels on fresh meats than households without these objectives. This supports previous research on processed foods, which indicated that consumers look more for content of unfavorable nutrients (such as fat and cholesterol) than for favorable nutrients, such as protein (Piedra, Schupp, and Montgomery, 1996).

The finding that higher income respondents were less likely to read nutrition labels was not expected. One possible explanation is that the higher income respondents work more hours and are thus more likely to shop for groceries on their way home from work, thus devoting less time to the shopping experience. Higher income households also may eat outside the home more frequently and not be as concerned with the nutritional content of meals prepared in the home.

Table 3. Logit Analysis of Households Reporting That They Read Nutritional Labels on Fresh Retail Meat Packages, Fresh Meat Nutrition Study, Louisiana, 1997.

Variable ^a	Exp. Sign	Est. Coef.	Std. Error	T-ratio	M. Prob
Constant	+	0.9838	1.0052	0.9787	
Age of respondent	+,-	-0.0125	0.0146	-0.8564	
Family income	+	-0.8448	0.4320	-1.9556 ^b	-0.1265
Sex of respondent	+	0.1657	0.4101	0.4041	
Children present in household	+,-	-0.0259	0.4321	-0.0600	
Education level of respondent	+	-0.1866	0.4242	-0.4398	
Adult female is a homemaker	+,-	-0.0949	0.4449	-0.0213	
Respondent is retired	+	1.0910	0.6487	1.6818*	0.1633
Respondent is white	+,-	-0.5279	0.5253	-1.0049	
Town (pop < or equal to 100,000)	+,-	-0.2286	0.4561	-0.5012	
City (pop > 100,000)	+,-	0.3365	0.4317	0.7795	
Respondent is single	+,-	-0.9204	0.5621	-1.6366	
Meal (control fat, cholesterol & calories)	+	1.6776	0.5101	3.2886*	0.2512

^a Sex—female = 1; male = 0

Age—continuous variable

Children—children in home = 1; no children in home = 0

Education—college degree or higher = 1; less than college degree = 0

Homemaker—female is a homemaker = 1; female employed outside the home = 0

Retired—respondent is retired = 1; respondent is not retired = 0

Single—respondent is single with no children = 1; respondent is not single = 0

White—respondent is white = 1; respondent is nonwhite = 0

Town—household located in urban area with population of less than 100,000 = 1; household located in urban area with population of 100,000 or more = 0; rural was the omitted variable

City—household located in urban area with population of 100,000 or more = 1; household located in urban area with population of less than 100,000 = 0; rural was the omitted variable

Income—income of \$60,000 or higher = 1; income of less than \$60,000 = 0

Meal—control content of fat, cholesterol, and calories in daily meals = 1; do not control = 0

^b Significant at 10 percent level or better

McFadden $R^2 = 0.095$; -2* Log Likelihood Function = -222.4

Percentage of correct predictions—79.2

Table 4. Reasons for Respondents Choosing to Not Read Nutrition Labels on Packaged Fresh Meats, Fresh Meat Nutrition Study, Louisiana, 1997.

Reason	Number Responding	Percentage
I am familiar with the nutrient content of fresh meats	20	31.2
I don't have the time to check nutrition labels while shopping	16	25.0
I am not interested in the nutrient content of fresh meats	13	20.3
The nutrition labels are too hard for me to understand	3	4.7
Other reasons	<u>12</u>	<u>18.8</u>
Total	64	100.0

The failure of so many of the socioeconomic characteristics to explain the decision to read or not to read nutrition labels on fresh meats may indicate that the households have not had time to become aware of these labels and how they can be used in the shopping experience. According to the 1997 Nutrition Trends Survey conducted by the American Dietetic Association (1997b), only 7 percent of U.S. consumers get most of their nutrition information from labels (television was first with 57 percent). However, based on nutritional information on labels, 69 percent of respondents indicated that they bought some foods less often, and 65 percent bought some foods more often. Thus, when used, food labels do affect food selection. Nutrition educators, then, should be encouraged to strengthen efforts to inform consumers about labels and to provide guidance about their use in food selection.

These results would tend to encourage retailers to place the nutrition label on the package such that reading time is at a minimum and/or to combine the labels with point-of-purchase nutrition information on highly visible signs. At this point, the evidence suggests that retailers should use these labels without regard to targeting a specific market segment. When the use of nutrition labels on packaged fresh meats becomes more universal and consumers become more aware of how to use this information in their purchasing decisions, the traditional socioeconomic variables are likely to identify households that will have a higher probability of reading and using these labels. Additional research on the awareness and use of nutrition labels on fresh meats is needed after their use by retailers has become more widespread.

Future research in this area should attempt to associate the actual use of nutrition labels on fresh meats by individual stores with their customers' awareness and reading of these labels. This addition to the data would provide information on the effectiveness of label use by different stores in encouraging consumers to recognize and read these labels.

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