

FOOD SHOPPING AND LABEL USE BEHAVIOR AMONG HIGH SCHOOL-AGED ADOLESCENTS

Christine McCullum and Cheryl L. Achterberg

Ninety adolescents (41 males and 49 females) stratified by shopping experience (44 shoppers and 46 nonshoppers) were given a list of 20 foods to select in a supermarket. An interview was conducted to determine reason(s) given for each food selection, use of nutrition information, and other variables. Reasons most often reported for selecting foods were personal preference/taste, custom/habit, and price/cost. Participants were five times more likely to use front label/nutrition claims than nutrient labels. Fat free/low fat, lite/light, and cholesterol free/low cholesterol were the most commonly used claims whereas total fat and calories were the most commonly used nutrient label constituents. Females were more likely than males to use front label/nutrition claims ($F(1,82) = 4.78, p < .01$). There were no significant differences between males' and females' use of nutrient labels. Education that emphasizes food-shopping and label-reading skills is needed by adolescents.

INTRODUCTION

Congress passed the Nutrition Labeling and Education Act (NLEA) in 1990, a law requiring that virtually all foods regulated by the Food and Drug Administration (FDA) carry a food label. Although not mandated by the new law, the United States Department of Agriculture (USDA) also decided to develop complementary regulations that requires nutrition labeling on virtually all processed meat and poultry products. A voluntary nutrition labeling program for raw meat and poultry products has also been established. The NLEA also addresses serving size, use of nutrient descriptors (e.g., fat free), health claims, reference information, and label format. A unique aspect of the NLEA is its emphasis on consumer education (Office of the Federal Registrar, 1993). However, before effective educational efforts can be attempted,

This research was supported by a HATCH Grant Number 404-61 1218 3226 from the United States Department of Agriculture (USDA). The authors wish to thank Giant Foods, Inc. and their personnel for their cooperation with this project.

Christine McCullum, M.S., R.D., Research Assistant, Penn State Nutrition Center.

Reprint requests to Cheryl Achterberg, Ph.D., Associate Professor of Nutrition and Director of the Penn State Nutrition Center, 417 E. Calder Way, University Park, Pennsylvania 16801-5663.

ADOLESCENCE, Vol. 32, No. 125, Spring 1997
Libra Publishers, Inc., 3089C Clairemont Dr., Suite 383, San Diego, CA 92117

educators should understand how consumers make decisions about food choices and the role played by food labels in those choices. One high-risk group that needs to be evaluated in relation to its food choice behavior is adolescents.

Because of the increasing number of two-working parent families and single-parent households, the number of adolescents who are either doing food shopping for themselves or their families is increasing. A recent survey by Teenage Research Unlimited revealed that as many as 90% of teenagers (both boys and girls) shop for their families (Blumenthal, 1990) spending 4 billion dollars annually on food and snacks alone. In addition, teenagers receive an additional 19.2 billion dollars from their parents for family shopping (McNeal, 1992). Price, taste, brand name, the media, as well as parental and peer influence are only some of the factors influencing adolescents' food purchasing decisions (Blumenthal, 1990; *Food and Beverage Marketing & Forecast Magazine*, 1988; Rolls, 1988; Clancy-Hepburn, Heckey, & Nevill, 1974). Adolescents' food-purchasing habits may have an immediate as well as long-term impact on their behavior which in turn, may affect their health (i.e, susceptibility to acute and chronic disease) (National Research Council, 1989). Therefore, adolescents need to be taught appropriate food-shopping and label-reading skills.

Knowing if and how adolescents use nutrition-label information is important for developing appropriate food-shopping and label-reading education. However, it is not known whether adolescents use nutrition information when selecting foods. The Fifth Annual Food and Nutrition Survey (*Food and Beverage Marketing & Forecast Magazine*, 1988) reported that 70% of teenagers said it is at least "somewhat important" to know the ingredients of a food item. However, 49% of teenagers said they did not read labels and 51% of those who looked at the labels reported difficulty in deciphering the nutritional and ingredient information. Of those who did read food labels, calorie content was by far the most often sought information. When asked whether they felt that specific ingredients (e.g., sugar, salt, food additives and preservatives, artificial coloring and flavor) should be listed on a food package, at least 19% of teenagers were unsure (Blumenthal, 1990). A study by Thomsen, Terry, and Amos (1988) found that labels on food packages were adolescents' third most common source of nutrition information after television and parents/guardians. However, specific types of information that were used on the food label (e.g., nutrient labels or nutrition/health claims) were not examined.

Another consideration relevant to educational efforts is potential gender differences (Probart, 1993). Several studies have addressed this issue in relation to adolescents' dietary behavior and use of nutrition

information. Vebrugge (1982) reported differences between male and female children/adolescents regarding health care utilization, nutrient intake, and preventive health behavior. Allen, Thombs, and Mahoney (1993) noted that gender was a significant factor in predicting dieters from nondieters. Nondieters were more likely to be male whereas occasional and frequent dieters were more likely to be female. A study that assessed adolescents' self-reported compliance with the USDA Dietary Guidelines for Americans (Read, Harveywebster, & Usinger-Lesquer-euz, 1988) indicated gender differences in compliance on two dietary guidelines. Females reported lower compliance than males to the guideline "maintain desirable body weight" whereas males reported lower compliance to the guide "reduce salt intake." In another study that addressed adolescents' sources of nutrition information (Thomsen, Terry, & Amos, 1988), it was reported that females were more likely than males to receive nutrition information from books, magazines, and parents, while males were more likely to receive the information from coaches. However, whether there are differences between adolescent males and females with regard to why they select foods and how they use nutrition label information is not shown. The purpose of this study was to explore food shopping and label use behavior among high school-aged adolescents at point-of-purchase and to determine if there were significant gender differences related to these behaviors.

METHOD

Subjects

The sample population consisted of 90 high school-aged adolescents (41 males and 49 females) from Central Pennsylvania. No upper or lower age limit was used other than that each participant be a high school student (grades nine through twelve). Human Subjects approval was obtained and each subject and his or her parent completed an informed consent form. Participants were recruited from local high school home economics and health classes. Since enrollment in these classes was mandatory for all students, the sample population was not biased by a special interest in food shopping and/or nutrition. This study was conducted by investigators from a nutrition department and a rural sociology department at a major university; however, all potential participants were told that the study was being conducted in conjunction with the rural sociology department to help reduce social desirability effects (e.g., overreporting of health-related reasons to select food items).

Design

The participants were divided into four categories: males who shop ($n = 20$); males who do not shop ($n = 21$); females who shop ($n = 24$); and females who do not shop ($n = 25$). The rationale behind controlling for shopping experience is that it might be confounded with gender (i.e., girls shop more often and may have developed better shopping skills) (Hauser, 1986). Subjects were operationally defined as shoppers if they reported shopping for groceries (for at least five food items) at least once a month. Subjects who shopped less than once a month or for less than five food items were defined as nonshoppers. The study was conducted in one supermarket to control for store layout and format, floor space, and distance between aisles and shelves because these factors might influence shopping behavior (Park, Iyer, & Smith, 1989).

Measures and Procedure

Two separate pilot studies were conducted over a one-year period. The first consisted of testing an open-ended, structured interview protocol developed to assess food shopping and label use behavior. The purpose of this pilot was to pre-test the protocol in the grocery store setting as well as to determine the clarity of the questions. The second pilot consisted of a series of focus groups that were conducted to detect any other pertinent issues not considered in the protocol, such as health-related conditions and interest level in foods, cooking, nutrition, and fitness.

Once recruited, subjects were mailed a questionnaire to collect demographic information which included: age, grade level, gender, race, parents' highest grade level completed, parents' occupation, and description of geographic location of their home. Subjects were asked to indicate their reasons for purchasing five foods (cereal, juice/juice drink, margarine/butter, milk, and snack chips). The response categories were brand, convenience, habit, healthy, price, taste, other, plus a never-bought option. These categories were predetermined from the leading reasons marketers report adolescents give for purchasing food items (*Food and Beverage Marketing & Forecast Magazine*, 1988). "Healthy" was listed as an option in our survey because previous pilot studies indicated that health considerations were important in adolescents' food selection criteria. The purpose of this survey was to compare reasons for food item selections in the supermarket versus not in the supermarket. Subjects mailed back or returned both completed forms to the researcher.

The study was conducted in a supermarket from May through August 1983. Subjects were asked to select 20 generic food items from a predetermined list (Table 1). To simulate the actual process of grocery shopping, the selected foods were placed into a grocery cart. The list

Table 1. List of Twenty Experimental Food Items

salad dressing
snack chips
canned fruit
macaroni and cheese
muffin or cake mix
hotdogs
cereal
soy sauce
pancake syrup
beans
frozen dinner
meat
juice or juice drink
tortilla or taco shells
waffles
peanut butter
milk
yogurt
cheese
margarine or butter

included foods that were commonly purchased and/or consumed by adolescents according to our pilot study results and the available marketing research (McNeal, 1992). Five food items not commonly purchased or consumed by adolescents in this geographic region (beans, frozen dinner, soy sauce, tortillas/taco shells, and waffles) were also included in order to compare differences in food shopping behavior and label use for familiar versus unfamiliar items. The list was ordered to facilitate locating the items, especially for nonshoppers and shoppers unfamiliar with the store. A map of the store was also provided for this purpose. Subjects then were asked to verbalize their responses by "thinking out loud" as they made their selections. This technique is

known as a "verbal protocol" and its use is well-documented in studies of consumer behavior (Murtaugh, 1984). Responses were tape recorded and all interpretable responses were later coded for reason(s) stated for food item selection, use of nutrition information, and other comments.

After all the items had been selected and placed into a grocery cart, an open-ended, structured interview was administered to participants in a corner of the store in order to assess food shopping and label use behavior. The questions were as follows: Do you or anyone in your family have a condition which affects the foods you eat? Which family member(s) are responsible for the food shopping? What is your involvement in food shopping and food preparation? The next section identified the name and type of food items selected, use of each food item by the participant and/or his/her family members, reason(s) for each selection, and use of front label/nutrition claims and nutrition information on the back label (e.g., nutrient label). Last, participants' interest in food, nutrition, cooking, and fitness was assessed. All interviews were conducted by one trained interviewer, and after completion, subjects were given a free movie voucher for participating in the study. The entire procedure took approximately one hour. For the purpose of this paper, results are reported only for the open-ended, structured interview. Results of the mail survey and verbal protocol are reported elsewhere (McCullum, 1994).

Statistical Analyses

Standard descriptive statistics on all variables were computed, and scores were calculated for the average number of times particular reasons were given per interview for selecting 20 food items and for the use of nutrition information (both front label/nutrition claims and nutrient labels). The independent variables of interest included gender, shopping experience, health-related condition(s) that affected food choice, and interest level in foods, cooking, nutrition, and fitness; the dependent variables included reasons for item selection and use of nutrition information. Two-tailed *t* tests for independent sample means were used to determine if there were significant differences between males and females and reasons given for item selection. One-way analysis of variance (ANOVA) was used to determine if there were any relationships between use of front label/nutrition claims, nutrient labels, or "healthy" as reasons for selecting foods and interest level in foods, nutrition, cooking, and fitness. A Scheffé's test was used to determine significant differences between groups. Contingency chi-square tests were used to determine interrelationships between the independent variables. A three-factor ANOVA was used to examine interactive effects of gender, shopping experience, and interest level

in nutrition on use of nutrition information. Level of statistical significance was set at $p < .10$ (except Scheffé's test which was set at $p < .05$) in order to reduce the chance of Type II error in this exploratory study. All statistical procedures were performed using the Statistical Packages for the Social Sciences (SPSS, Inc., 1990).

RESULTS

Univariate Analysis

The subjects were predominantly white (82%; $n = 91$) and came from highly educated, two-parent families (see Table 2 for more information). The majority of subjects (83%; $n = 75$) described the geographic location of their home as suburban or a college town, while a smaller number described it as rural or a small town (17%; $n = 15$). Subjects ranged in age from 14 to 18 years with a mean age of 15. About 65% were in the tenth grade. Of the 44 subjects (49%) in the food shopping group, 39% reported shopping once a month, 42% reported shopping once every few weeks, and 19% reported shopping once or more a week. Of the total sample, 17% ($n = 15$) reported having a condition that affected food choices, and 21% ($n = 19$) reported that someone in their family had a condition that affected the choices (Table 3).

The top five reasons adolescents gave for food item selection across the 20 foods were: (1) personal preference/taste; (2) custom/habit; (3) cost/price; (4) brand name; (5) front label/nutrition claim. Use of nutrient label as a reason to choose food items was ranked at number twelve. However, when the three health-related reasons (front label/nutrition claim, "healthy," and nutrient label) were grouped together to form a "combined health" reason, this became the second most common factor for selecting food items. Table 4 gives the rank order for the mean number of times each reason was given to select food items per interview. Other reasons given in rank order that were not included in Table 4 because of small numbers reported were: "first seen," "it makes me feel good inside," family preference, new item, store promotion, product promotion, shape of an item, allowed by parent, don't know, recyclable packaging, friend's influence, and prize(s).

Fat free/low fat, light/lite, and cholesterol free/low cholesterol were the most commonly used front label/nutrition claims. Total fat and calories were the most commonly used constituents on nutrient labels. Overall, front label/nutrition claims ($M = 3.01$; $SD = 3.03$) were used about five times more often than nutrient labels ($M = 0.61$; $SD = 1.08$) for nutrition information.

Table 2. Subject Characteristics of the Sample

Demographic Variables	N	%N
Household Composition (N = 90)		
Single-parent	14	(16%)
Two-parent	76	(84%)
Father's Education Level (N = 87)		
High School Diploma	10	(12%)
Some College/Technical School	18	(21%)
Bachelor's Degree	23	(26%)
Advanced degree	36	(41%)
Mother's Education Level (N = 89)		
High School Diploma	10	(11%)
Some College/Technical School	32	(36%)
Bachelor's Degree	27	(30%)
Advanced Degree	20	(23%)
Father's Occupation (N = 86)		
Untrained/Manual Labor	5	(6%)
Technical/Paraprofessional	12	(14%)
Professional	63	(73%)
Self-Employed	4	(5%)
Student	2	(2%)
Mother's Occupation (N = 86)		
Housewife	19	(22%)
Wage/Payroll Worker	5	(6%)
Technical/Paraprofessional	22	(26%)
Professional	34	(40%)
Self-Employed	3	(3%)
Student	3	(3%)

Note: The number of cases varies because of missing data.

Table 3. Conditions That Affect Foods Eaten For Self and Family Members (N = 90)

	Self		Family Member(s)	
	N	%N	N	%N
Do you have a condition?:				
No	75	83	71	79
Yes	15	17	19	21
What is this condition?:				
High Cholesterol	5	6	7	8
Vegetarianism	4	4	1	1
Dieting	3	3	1	1
Eating Disorder	2	2	0	0
Family History of				
Heart Disease	1	1	0	0
Food Allergy	0	0	3	3
Hypertension (HTN)	0	0	3	3
What is this condition?				
Diabetes	0	0	1	1
HTN + Diabetes	0	0	1	1
HTN + High				
Cholesterol	0	0	1	1
Heart Disease	0	0	1	1

Table 4. Rank Order of Mean Number of Times Each Reason Was Given Per Interview to Select Twenty Experimental Food Items.^a

Reason	<i>M</i>	<i>SD</i>
Personal Preference/Taste	10.82	3.18
"Combined Health" Reason ^b	5.40	2.23
Custom/Habit	5.37	3.01
Cost/Price	4.49	4.16
Brand Name	3.54	2.97
Front label/Nutrition Claim	3.01	3.03
Package Appearance	2.08	2.05
Healthy	1.78	2.10
Package Size	1.04	1.53
Package Function	1.01	1.11
Availability	0.84	1.01
Convenient Preparation	0.75	1.06
Nutrient Label	0.61	1.08
Television Advertising	0.54	0.11

^a One case was deleted because of missing variables.

^b This reason consists of front label/nutrition claim, "healthy", and nutrient label.

Bivariate Analysis

Mean scores were higher for males than for females for using the following reasons: package appearance (males = 2.45; females = 1.73), ($t(87) = 1.76, p < .10$); package size (males = 1.26; females = .85), ($t(87) = 1.80, p < .10$); and package function (males = 1.24; females = .81), ($t(87) = 1.82, p < .10$). Mean scores were higher for females than for males for using front label/nutrition claims (males = 1.93; females = 3.93), ($t(87) = -3.37, p < .001$) and nutrient labels (males = 0.32; females = 0.85), ($t(87) = -2.53, p < .05$).

Participants with a higher level of interest in nutrition had higher mean scores for use of front label/nutrition claim (not-somewhat interested = 1.27; interested = 3.02; very interested = 4.96); ($F(2,86) = 11.06, p < .001$), nutrient label (not-somewhat interested = 0.23; interested = 0.48; very interested = 1.26); ($F(2,86) = 6.86, p < .01$), and "healthy" (not-somewhat interested = 1.04; interested = 1.90; very interested = 2.39); ($F(2,86) = 2.76, p < .10$) than those with a lower level of interest in nutrition. For use of front label/nutrition claims, differences between those who were not-somewhat interested and interested in nutrition; not-somewhat interested and very interested in nutrition; and interested and very interested in nutrition were statistically significant at $p < .05$). For use of nutrient labels, differences between those who were not-somewhat interested and interested as well as interested and very interested were statistically significant at $p < .05$. There were no significant differences between interest level in foods, cooking, and fitness and use of front label/nutrition claim or nutrient label as reasons for item selection. Participants with a higher interest level in fitness had higher mean scores for use of the reason "healthy" (not-somewhat interested = 0.82; interested = 1.41; very interested = 2.36) than those with a lower interest level in fitness ($F(2,86) = 4.14, p < .05$). Differences between those who were not-somewhat interested and very interested in fitness were statistically significant at the .05 level.

Multivariate Analysis

As a preliminary step to a three-factor ANOVA, interrelationships among the independent variables (e.g., gender, shopping experience, reporting a health-related condition that affected food choice, and interest level in nutrition) were investigated. There was a significant interrelationship between gender and interest level in nutrition ($\chi^2(2, N = 90) = 9.39, p < .01$). Females were more likely than males to have a higher level of interest in nutrition. There was also a significant interrelationship between gender and reporting a health-related condition that affected food choices. Females were also more likely to report a condition that affected food choices made ($\chi^2(1, N = 90) = 6.21, p < .01$). There were no significant interrelationships between gender and shopping experience ($\chi^2(2, N = 90) = 0.37, p = .69$) or shopping experience and interest level in nutrition ($\chi^2(2, N = 90) = 1.11, p = .57$).

Next, a three-factor ANOVA that examined the interactive effects of gender, shopping experience, and interest level in nutrition on the use of nutrition information was performed. Females were more likely to use front label/nutrition claims ($F(1,82) = 4.78, p < .01$) when control-

ling for interest level in nutrition and shopping experience (Table 5). There were no significant differences between males and females on use of nutrient labels ($F(1,82) = 2.18, p = .14$) with the same controls (Table 6). When controlling for gender and shopping experience, those with a higher level of interest in nutrition were more likely than those with a lower level to use front label/nutrition claims ($F(1,82) = 6.87,$

Table 5. Main Effects of Gender, Shopping Experience, and Interest Level in Nutrition on Use of Front Label/Nutrition Claims (N = 89).^a

Independent Variable	Number of Cases	Unadjusted Mean Scores	Adjusted ^b Mean Scores	F
Gender				
Males	41	1.93	2.30	4.78 *
Females	48	3.94	3.61	
Shopping Experience				
Shoppers	44	3.50	3.41	1.89
Nonshoppers	45	2.52	2.62	
Interest Level in Nutrition				
Not-Somewhat Interested	26	1.27	1.61	6.87 **
Somewhat Interested	40	3.02	3.00	
Very Interested	23	4.96	4.62	

^a One case was deleted because of missing variables.

^b Adjusted for other independent variables in the model.

* $p < .05$. ** $p < .01$

$p < .01$) (Table 5) and nutrient labels ($F(1,82) = 4.56, p < .05$) (Table 6). Overall, in this sample, the combined main effects of gender, shopping experience, and interest level in nutrition accounted for 26% of the variation in front label/nutrition claim use. Similarly, the combined main effects for gender, shopping experience, and interest level in nutrition accounted for 17% of the variation in nutrient label use. There were no significant two-way interactions of gender, shopping experience, or interest level in nutrition on use of nutrition information. Three-way interactions were suppressed because of small cell sizes.

Table 6. Main Effects of Gender, Shopping Experience, and Interest Level in Nutrition on Use of Nutrient Labels ($N = 89$).^a

Independent Variable	Number of Cases	Unadjusted Mean Scores	Adjusted ^b Mean Scores	<i>F</i>
Gender				
Males	41	0.32	0.43	2.18
Females	48	0.86	0.76	
Shopping Experience				
Shoppers	44	0.75	0.74	1.41
Nonshoppers	45	0.47	0.48	
Interest Level in Nutrition				
Not-Somewhat				
Interested	26	0.23	0.33	4.56 *
Interested	40	0.48	0.47	
Very				
Interested	23	1.26	1.18	

^a One case was deleted because of missing variables.

^b Adjusted for the other independent variables in the model.

* $p < .05$

DISCUSSION

Taste/personal preference, custom/habit, and price/cost were found to be most important factors in food selection among high school-aged adolescents. These results partially support the findings of a larger marketing survey for the leading reasons given to select food items. However, in this sample, health-related reasons also played an important role in item selection. This finding was not evident from the same previous large-scale marketing survey conducted with adolescents (*Food and Beverage Marketing & Forecast Magazine*, 1988).

Food labels appear to be at least somewhat important to adolescents when selecting food items. However, front label/nutrition claims appear to be used more often than nutrient labels. Those who were interested in nutrition, especially those who were very interested, were more likely than those who were less interested in nutrition to use nutrition information (e.g., front label/nutrition claims and nutrient labels) when selecting food items. However, there was much unaccounted for variation in regard to the factors that determine use of nutrition label information. In addition, those who were more interested in fitness were more likely to use the "healthy" than were those who were less interested in fitness when selecting food items. Further research is needed to determine other factors that account for the variation in adolescents' use of health-related reasons to select foods and use of nutrition label information.

Males were more likely to consider package influence (e.g., package appearance, function, and size) when selecting food items. This suggests that male adolescents may be more concerned about other aspects of the package than the actual food label. However, knowing that males actually utilize the packages of food products can be useful when developing nutrition education that could teach them to use other parts of the package (e.g., food labels).

Females were more likely to use front label/nutrition claims when selecting food items. In addition, females were more likely to be interested in nutrition and to report a condition that affected food choices. This suggests that females may be more concerned with health-related and/or weight control issues (e.g., using the claim "fat free" because of high serum cholesterol or using the claim "lite/light" to determine if a food item is low in calories). Numerous examples in the literature suggest that female adolescents are preoccupied with "thinness" and "dieting" (e.g., Allen, Thombs, & Mahoney, 1993; Conner-Greene, 1988; Rothblum, 1990). A qualitative study that examined the meanings of food within the North American adolescent female culture (Chapman & Maclean, 1993) found that females associated the consumption

of junk food with weight gain, pleasure, friends, independence, and guilt, whereas consumption of "healthy" food was associated with weight loss, parents, and being at home. It is also interesting to note that all four participants who reported being vegetarians were female. As well as an indication of concern about health and weight, female adolescents may also be becoming more involved in social concerns such as the environment and animal rights. Therefore, when developing education materials for shopping skills and label reading, special attention should be paid to these concerns of female adolescents.

The need for more exploratory, qualitative research in naturalistic settings to better understand the consumer's buying behavior has been identified (Weinstein, 1989). The data collection method used in this study helps fulfill this need. It has been estimated that up to 50% of all purchase decisions are made within the supermarket (Jeffrey, Pirie, & Rosenthal, 1982). The point-of-purchase interview utilized in this study allowed for evaluation of the use of nutrition label information in the context of food-choice decisions that would not be possible via mail or over the telephone. For example, in this study, "combined health" reason (e.g., front label/nutrition claim, "healthy," and nutrient label) was the second most common factor reported for food item selection. A previous marketing survey did not show that health-related factors played a significant role in adolescents' food item selections (*Food and Beverage Marketing & Forecast Magazine*, 1988).

In a review by Glanz, Hewitt, and Rudd (1992), it was pointed out that self-report measures may be compromised by nonresponse, high respondent burden, incomplete data, and social desirability bias. It was suggested that, whenever possible, research should attempt to use field studies, simulations, observations, and/or environmental measures (e.g., sales data) on at least a subsample of the respondents. Other recommendations were prospective studies of food shopping behavior, small- and large-scale experiments, and inclusion of carefully developed measures of intentions to select specific foods and types of foods, and direct and proxy measures of food purchase. Again, the methods used in this study were productive and may be useful in other similar studies.

There were several limitations to the present study. First, the sample included adolescents who were primarily white from highly educated, two-parent families. Therefore, the results cannot be generalized. Indeed, these results represents a "best case scenario." Results from a more general sample may indicate even less use of nutrition label information and/or "health reasons" for food selection. Second, the sample size was relatively small which also affects the generalizability of the results. However, the importance of this criti-

cism is at least somewhat mitigated by the findings that partially support the marketing literature on adolescents' food-purchasing behavior (*Food and Beverage Marketing & Forecast Magazine*, 1988). Third, the point-of-purchase interview was time consuming; therefore, a large number of interviews could not be generated at one site in a short period of time. To overcome this limitation, we recommend that multiple sites in different areas be used simultaneously, providing that the interviewers are carefully trained and monitored. And fourth, this method of data collection is more costly than mail or telephone surveys on a per respondent basis. Based on the results of this study, the following recommendations can be made. First, a larger study with adolescents from different socioeconomic and ethnic backgrounds is needed to confirm these results. Second, other factors that play a role in adolescents' interest in and understanding of nutrition information needs to be investigated. Third, the point-of-purchase interview as a method for assessing food shopping behavior should be investigated further. Fourth, nutrition education that emphasizes grocery shopping and food label reading skills is appropriate and needed by adolescents in order for them to make better food choices. And fifth, changes in behavior as a result of such education should be assessed.

REFERENCES

- Allen, K. M., Thombs, D. L., & Mahoney, C. A. (1993). Relationships between expectancies and adolescent dieting behavior. *Journal of School Health*, 63(4), 176-181.
- Blumenthal, D. (March, 1990). When teens take over the shopping cart. *FDA Consumer*, 32-36.
- Chapman, G., & Maclean H. (1993). "Junk food" and "healthy food": Meanings of food in adolescent women's culture. *Journal of Nutrition Education*, 25(3), 108-113.
- Clancy-Hepburn, K., Heckey, A. A., & Nevill, G. (1974). Children's behavior responses to TV food advertisements. *Journal of Nutrition Education*, 6(2), 93-96.
- Conner-Greene, P. A. (1988). Gender differences in body weight perceptions and weight loss strategies of college students. *Women's Health*, 14(2), 647-658.
- Food and Beverage Marketing & Forecast Magazine*. (1988). Fifth Annual National Teenage Food and Nutrition Study. *Marketing Weekly* (Suppl. 30), 16-17.
- Glanz, K., Hewitt, M., & Rudd, J. (1992). Consumer behavior and nutrition education: An integrative review. *Journal of Nutrition Education*, 24, 267-277.
- Hauser, G. (1986). How teenagers spend the family dollar. *American Demographics*, 8(12), 38-41.

- Jeffrey, R. W., Pirie, P. L., & Rosenthal, W. M. (1982). Nutrition education in supermarkets: An unsuccessful attempt to influence knowledge and product sales. *Journal of Behavioral Medicine*, 5, 189-200.
- McNeal, J. U. (1992). Kids as customers: A handbook of marketing to children (pp. 12-84). New York: Lexington Books.
- McCullum, C. (1994). *Food shopping and label use behavior among high school-aged adolescents*. Unpublished master's thesis, The Pennsylvania State University, University Park, PA.
- Murtaugh, M. (1984). A model of grocery shopping decision process based on verbal protocol data. *Human Organization*, 43(3), 243-251.
- National Research Council. (1989). *Diet and health: Implications for reducing chronic disease*. Washington, DC: National Academy Press.
- Nutrition Labeling and Education Act of 1990, §101-535, 104 U.S.C. §2353 (1990).
- Office of the Federal Registrar, National Archives and Records Administration. (January 1993) Food Labeling; General Provisions; Nutrition Labeling; Label Format; Nutrient Content Claims; Ingredient Labeling; State and Local Requirements; Final Rules (RIN 0905-AD08 and 0905-AD68), *Federal Registrar*, 22066-222174.
- Park, C. W., Iyer, E. S., & Smith, D. C. (1989). The effects of situational factors on in-store grocery shopping behavior: The role of environment and time available for shopping. *Journal of Consumer Research*, 15, 422-433.
- Probart, C. K. (1993). In-store nutrition education utilizing student educators. *Journal of Nutrition Education*, 25(1), 25-28.
- Read, M. H., Harveywebster, M., & Usinger-Lesquereux, J. (1988). Adolescent compliance with dietary guidelines: Health and education implications. *Adolescence*, 23(91), 567-575.
- Rolls, B. (1988). Food beliefs and food choices in adolescents. *Medical Journal of Australia* (Suppl. 148), 9-13.
- Rothblum, E. D. (1990). Women and weight: Fad and fiction. *Journal of Psychology*, 124(1), 5-24.
- SPSS Advanced Statistics Guide* (1990). Chicago, IL: McGraw-Hill.
- Thomsen, P. A., Terry, R. D., & Amos, R. J. (1988). Nutrition information sources used by adolescents. *Home Economics Research Journal*, 16, 215-221.
- Verbrugge, L. M. (1982). Sex differentials in health. *Public Health Reports*, 97, 417-437.
- Weinstein, S. (1989). Business research: Evolving as companies adapt to a changing marketplace. *Marketing News*, 23(16), 1-2.