USDA United States Department of Agriculture
Food and Nutrition Service

DIETARY INTAKE AND DIETARY ATTITUDES AMONG FOOD STAMP PARTICIPANTS AND OTHER LOW-INCOME INDIVIDUALS

Office of Research and Analysis **September 2000**

Background

The Food Stamp Program (FSP) is designed to "safeguard the health and well-being of the Nation's population by raising the level of nutrition among low-income households." The program aims to meet this objective by providing food stamp benefits to low-income households that can be used to purchase foods from authorized food retailers. The program also supports nutrition education efforts, by providing funds for states to set up nutrition education programs (NEPs) for FSP participants. As of fiscal year 2000, the FSP had agencies with approved NEPs in 48 states and federal funding for these programs was projected to total $99 million.

In studying the effectiveness of the FSP, a critical research question involves determining the relationship between program participation and dietary outcomes. An unresolved issue in the literature on the effects of the program is the role of dietary knowledge and attitudes. It is not known whether participants and low-income nonparticipants differ in their dietary knowledge and attitudes or whether any such differences influence their dietary intake. Finally, it is not known whether controlling for any such differences would influence the estimated relationship between food stamp participation and dietary outcomes.

This report examines the dietary knowledge and attitudes of low-income individuals, including FSP participants and nonparticipants, describes their dietary intake, and estimates participation-dietary intake relationship. In particular, the analysis addresses three basic questions:

- What do low-income adults know about healthy eating practices, and how do they feel about these practices and about their own diets.
- What do low-income Americans eat, and how do their diets stack up against accepted standards for healthy eating?
- What is the relationship between food stamp participation and dietary intake among low-income individuals and do differences in the dietary knowledge and attitudes among participants and low-income nonparticipants mediate this relationship?

Methods

The analysis was based on data from the 1994-1996 Continuing Survey of Food Intakes by Individuals (CSFII) and the associated Diet and Health Knowledge Survey (DHKS). These nationally representative data sets were used to create an analysis file containing about 4,000 low-income and 10,000 high-income preschoolers, school-age children, and adults. Low-income and high-income individuals were distinguished on the basis of whether their household income was below or above 130 percent of poverty. The high-income sample was included to provide benchmark values for the low-income sample.

Estimates of the relationship between participation and dietary outcomes were based on regression models in which the dependent variables were the dietary outcomes, and the independent variables included food stamp benefits and a wide range of individual and household characteristics.

One limitation of the analysis is that, since experimental methods were not used, the estimates of the effects of FSP participation on dietary outcomes may have been biased by unobserved differences between participants and nonparticipants. Previous studies have cited dietary knowledge and attitudes as one possible source of this bias. A major aim of this study is

to address this possible methodological weakness by controlling explicitly for the dietary knowledge and attitudes of low-income adults to determine whether this affects the estimated participation-dietary intake relationship. The analysis also controls for differences between the income and health status of participants and nonparticipants, as well as many other factors. However, other unobserved factors that represent the degree to which participants are socially or economically disadvantaged may remain.

Dietary Knowledge and Attitudes Among Low-Income Adults

There is room for improvement in two dimensions of dietary knowledge among low-income adults. Large numbers of low-income adults do not know specific facts related to the health consequences of particular dietary practices, such as what health problems result from eating particular types of foods. Similarly, many low-income adults do not know specific facts related to what types of dietary practices are healthful, such as what specific foods they should eat to maintain a healthy diet. More specifically:

Among low-income adults, FSP participants and nonparticipants do not differ significantly in their levels of dietary knowledge according to any of the three knowledge indicators that were examined.

In general, low-income adults have lower dietary knowledge levels than high-income adults. Overall, the high-income group is between 10 and 20 percent more likely than the low-income group to be able to recall specific pieces of dietary information.

On average, low-income adults can correctly identify just over half of a set of health problems associated with specific dietary practices such as eating too much fat or not enough fiber. More than two-thirds of these adults know the consequences of being overweight, eating too much fat, and eating too much cholesterol, while only 40 percent know that not eating enough fiber is associated with bowel problems, heart problems, and/or cancer.

On average, low-income adults know less than half of the U.S. Department of Agriculture's Food Guide Pyramid recommendations for the daily consumption of the five major food groups. They are particularly unlikely to know that they should consume at least six servings of grain products and three servings of vegetables daily.

Low-income adults know an average of just over half of a set of facts related to the fat or cholesterol content of specific foods. For example, only 30 percent know that cholesterol is found in animal products like meat and dairy products and only 47 percent know that hot dogs contain more fat than ham.

Both low- and high-income adults appear to place great importance on healthy eating. About 60 percent of each group strongly agrees that "what you eat can make a big difference in your chance of getting a disease." Both groups are also likely to place high importance on following specific healthful dietary practices, such as choosing a diet that is low in fat and cholesterol and that contains plenty of fruits and vegetables. Among low-income adults, for example:

- Seventy-two percent feel that it is very important to choose a diet with plenty of fruits and vegetables.
- Sixty-four percent feel that it is very important to choose a diet low in fat.
- Sixty-one percent feel that it is very important to choose a diet low in cholesterol.

These findings suggest that low-income adults' relatively low levels of dietary knowledge, as described above, do not translate into complacency about their diets. These individuals still feel that it is important to follow healthful dietary practices and that such practices influence health outcomes.

Substantial numbers of low-income adults are not confident that their own diets comply with

these healthful dietary practices. They are likely to believe either that their diets are too low in a key vitamin or mineral or are too high in total calories or a key macronutrient. In particular:

FSP participants are more likely than nonparticipants to believe that their diets are too low in key vitamins and minerals and too high in key macronutrients. For example, 47 percent of participants and 31 percent of nonparticipants believe their diets are too low in fiber, while 50 percent of participants and 39 percent of nonparticipants believe their diets are too high in fat.

Low-income and high-income adults are about equally likely to believe that their diets are too low in key vitamins and minerals, but high-income adults are more likely to believe that their diets are too high in key macronutrients (such as fat).

Among the low-income group, just over one-third believe their diets are too low in calcium, fiber, and iron, while 25 percent believe their diets are too low in vitamin C.

Among the low-income group, 43 percent believe their diets are too high in fat, 33 percent believe their diets are too high in sugar and sweets, and 32 percent believe their diets are too high in calories.

The finding that FSP participants are more likely than nonparticipants to lack confidence in the quality of their diets is particularly interesting given that the two groups have similar levels of dietary knowledge and other types of dietary attitudes. This finding has at least three potential explanations. First, participants may lack confidence in the quality of their diets to a greater extent than nonparticipants because of the nutrition education efforts of the FSP. Second, the difference may arise because participants are in poorer health than nonparticipants. For example, Bialostosky and Briefel (2000) found that participants are more likely than nonparticipants to be obese and to smoke cigarettes. Third, the difference may reflect a true difference in participants' and nonparticipants' dietary attitudes.

What Low-Income Americans Eat

The diets of low-income Americans can be examined from a number of perspectives. The analysis in this report examines individuals' dietary habits, the foods they consume, their intake of food energy and vitamins and minerals, and their intake of macronutrients and other dietary components such as fiber and cholesterol.

Many low-income adults do not engage in specific dietary habits intended to lower the fat and cholesterol content of their diets, such as removing fat from the meat they consume, avoiding fat as seasoning, and substituting or replacing high-fat foods with lower-fat alternatives. For example, only:

- Twenty-five percent never put butter or margarine on cooked vegetables.
- Twenty-three percent always use skim or low-fat milk rather than whole milk.
- Seventeen percent always eat low-fat luncheon meats instead of regular luncheon meats.
- Thirteen percent eat meat at a main meal less than once a week.
- Forty-one percent always remove the skin when eating chicken.

Low-income individuals consume less than the Food Guide Pyramid recommendations for the daily consumption of all five major food groups. Typically, about half of the individuals in a particular age group fail to meet the minimum servings recommendation for a given food group. For some foods and some age groups, consumption is especially low.

Among low-income individuals in three age groups--preschoolers, school-age children, and adults--39 to 51 percent consume fewer than six servings of grain products daily; the Food Guide Pyramid recommends six to eleven servings.
Sixty percent of preschoolers eat fewer than three servings of vegetables daily; the Food Guide Pyramid recommends three servings for this age.

About 70 percent of school-age children and adults consume less than two servings of fruit daily; the Food Guide Pyramid recommends two to four servings.

Approximately 70 percent of adults consume less than two servings of dairy products daily; the Food Guide Pyramid recommends two to three servings.

Seventy percent of preschoolers eat fewer than two servings of meat or meat substitutes daily; the Food Guide Pyramid recommends two to three servings.

With low consumption of the five major food groups, low-income individuals consume large amounts of the foods in the pyramid tip (such as fat and added sugar). Among adults, for example, the mean intake of discretionary fat is 53 grams per day, while the mean intake of added sugar is 18 teaspoons per day. The intake of these food items in the pyramid tip is even higher among school-age children.

On average, low-income individuals' mean nutrient intake levels exceed the Recommended Dietary Allowance (RDA) for most vitamins and minerals. However, substantial proportions of low-income individuals are likely to have inadequate usual intakes for a number of micronutrients. Using usual intake below 70 percent of the RDA as the indicator of inadequate intake:

Preschoolers are most likely to have inadequate intakes of vitamin E, zinc, calcium, and iron.
School-age children are most likely to have inadequate intakes of calcium, vitamin A, vitamin E, zinc, and magnesium.

Adults are more likely than children to have inadequate intakes; the nutrients for which large numbers of low-income adults have inadequate intakes are calcium, zinc, vitamin E, magnesium, vitamin A, vitamin B , iron, vitamin C, and folate.

Adults also have low usual food energy intake levels; 79 percent of low-income adults have usual food energy intake levels less than the recommended energy allowance (REA), which is the estimated mean required intake level among adults. Since 50 percent of adults would be below the REA if they all met their required intake level, an estimated 29 percent of adults (79 minus 50) have intakes below their required intake levels.

Among preschoolers, low-income individuals have slightly higher mean intake levels of several vitamins and minerals than high-income individuals. This difference is statistically significant for protein, niacin, folate, and zinc. Among adults, however, the reverse is true. Low-income adults have significantly lower intake levels of 12 of the 14 vitamins and minerals that were examined.

Overall, low-income individuals are unlikely to meet the Dietary Guidelines for the intake of macronutrients such as fat, saturated fat, and carbohydrates, as well as for the intake of other dietary components such as fiber and sodium. Low-income individuals consume too much of their food energy in the form of fat or saturated fat and too little of their food energy in the form of carbohydrates. In particular:

Few low-income preschoolers meet the Dietary Guidelines for fat, saturated fat, and carbohydrates. For example, their mean intake of fat as a percentage of food energy is 34 percent and only 24 percent meet the dietary guideline of limiting their fat intake to no more than 30 percent of food energy. In addition, only 20 percent limit their protein intake to no more than twice the RDA, and a little over half meet the sodium RDA.

However, nearly four of five low-income preschoolers meet the dietary guideline of limiting their cholesterol intake.

Low-income school-age children have levels of fat, saturated fat, carbohydrate, and cholesterol intake in relation to the guidelines that are similar to those of low-income preschoolers. They are much more likely than preschoolers to meet the dietary guideline for protein but are much less likely to meet the sodium dietary guideline. Only 29 percent of low-income

school-age children limit their sodium intake to less than 2,400 milligrams.

Although low-income adults have slightly lower mean fat and saturated fat intakes than children, they remain unlikely to meet the Dietary Guidelines for fat and saturated fat intake. For example, only one in three meets the guideline for fat intake. Most low-income adults meet the dietary guideline for protein and cholesterol intake. However, their mean fiber intake is 14 grams, their mean sodium intake is 3,200 grams, and only 19 and 36 percent meet the Dietary Guidelines for fiber and sodium intake, respectively.

High-income individuals are much more likely than low-income individuals to meet many of the Dietary Guidelines. Among preschoolers and school-age children, the percentages of high-income individuals meeting the guidelines for fat, saturated fat, carbohydrate, cholesterol, and (among preschoolers only) sodium intake exceed the percentages of low-income individuals meeting these guidelines. For example, the percentages of high-income preschoolers meeting the fat and saturated fat guidelines are 41 and 28 percent, respectively, compared with 24 and 14 percent among low-income preschoolers. Among adults, high-income individuals are more likely than low-income individuals to meet the Dietary Guidelines for fiber, cholesterol, and sodium.

How Food Stamp Program Participation Affects Dietary Intake

There is little evidence that FSP participation is related to low-income individuals' food group choices. After controlling for individual and household characteristics and the dietary knowledge and attitudes of low-income individuals, there are almost no statistically significant differences in their average consumption of various food groups, including grain products, vegetables, fruit, dairy products, meat and meat substitutes, discretionary fat, and added sugar (the exceptions are significant negative relationships between participation and the intake of grains among preschoolers, the intake of vegetables among adults, and the intake of fish among adults).

Subject to the caveat that the analysis does not control for unobserved differences that may exist between participants and nonparticipants, it appears that participation does not influence the number of servings of the major food groups consumed by low-income individuals.

Participants and nonparticipants consume similar amounts of vitamins and minerals, on average. Among preschoolers, participation is insignificantly related to mean intakes of all nutrients except iron, for which there is a negative relationship. Among school-age children and adults, participation is insignificantly mean intakes of all nutrients except folate (for school-age children), for which there is a positive relationship.

Participants and nonparticipants are equally likely to have adequate usual nutrient intake levels. There are no significant differences for any of the micronutrients examined in the percentage of participants and nonparticipants whose usual intakes exceed 70 percent of the RDA (the measure of adequacy used in the analysis).

Participation appears to have little influence on low-income individuals' intake of macronutrients and other dietary components. The percentage of participants and nonparticipants meeting the Dietary Guidelines is not significantly different, with two exceptions. First, preschoolers who are FSP participants are significantly less likely to meet the dietary guideline for saturated fat. Second, adults who are participants are significantly less likely to meet the dietary guideline for fiber.

Participation is not related to two measures of diet quality examined--the Healthy Eating Index (HEI) and the Diet Quality Index (DQI). For each of the three age groups examined, the relationship between FSP participation and low-income individuals' HEI and DQI scores is statistically insignificant.

Participation does not appear to be related to dietary intake among a set of subgroups examined in the analysis. Most of the estimates of the effect of participation on intake among subgroups defined by age/gender, race/ethnicity, health status, and income level were statistically insignificant. The few estimates of the effect of participation on intake that were statistically significant did not follow any systematic pattern.

Where Low-Income Americans Obtain their Food

Low-income Americans obtain most of the food they consume from food stores. Low-income adults get three-fourths of their food from food stores, with 18 percent coming from restaurants and 8 percent from other sources. School-age children get only two-thirds of their food from stores, with 13 percent coming from restaurants and the rest (20 percent) coming from other sources (largely school breakfasts and lunches). Finally, low-income preschoolers get 82 percent of their food from stores.

Food stamp participation is related to where low-income individuals obtain their food. Among school-age children and adults, participants obtain more of their food from food stores and less from restaurants and other sources than nonparticipants, on average. This relationship holds up even after controlling for individual and family characteristics and other relevant factors. The most likely explanation for the effect of participation on where individuals obtain their food is that food stamps place constraints on where low-income households purchase their food. To legally use their food stamps, participants must purchase certain foods from certified food stores.

Reconciling the Findings with Previous Literature

This report set out to estimate the relationship between FSP participation and dietary intake after taking into account all the relevant factors potentially influencing participation. Since previous research had cited individuals' dietary knowledge and attitudes as a potentially important factor not typically taken into account, the analysis in this report advances the literature by controlling for dietary knowledge and attitudes in estimating how food stamp participation is related to dietary intake.

Results of the analysis show that low-income individuals' dietary knowledge and attitudes do not mediate the relationship between FSP participation and dietary intake. Controlling for adults' dietary knowledge and attitudes does not affect the estimated relationship between participation and dietary intake. Regardless of their dietary knowledge and attitudes, food stamp participation is not significantly related to low-income individuals' intake of food energy, vitamins and minerals, macronutrients, or food groups.

The results of this study are consistent with previous literature on the effects of food stamp participation on dietary intake. Most previous studies have found that participation is insignificantly related to the intake of most nutrients. Where significant relationships have been found, they have not consistently and systematically been positive or negative.

However, the results of research (including this study) on the effects of participation on dietary intake appear to be inconsistent with the results of other research showing that food stamp benefits lead to increases in food expenditures among low-income households. Other previous studies have found a positive relationship between a household's food stamp participation and the availability of nutrients in their household. If food stamps lead households to spend more on foods and to have larger amounts of nutrients available in their homes, one might expect that the benefits would also lead to increases in the dietary intake of household members. This study and the previous literature suggest that this is not the case.

Two methodological issues may partially explain this apparent inconsistency. First, the studies of the effects of food stamp participation on food expenditures and nutrient availability use the household as the unit of analysis, while the dietary intake studies use the individual as the unit of analysis. It is not clear how food

expenditures or nutrients available in the home are distributed across household members and across individuals who may not be members of the household.

Second, the food expenditure and nutrient availability studies are primarily based on data collected during the late 1970s, while a number of the intake studies are based on more recent data. Since the implementation of the FSP has changed over this period, the results of the studies may reflect changes in the effects of FSP participation over time.

If methodological differences between studies do not explain the pattern of results, two other factors may explain the lack of a positive relationship between participation and dietary intake in the face of estimates of positive effects on food expenditures. First, food stamps may lead participating households to purchase some foods that nonparticipating households might obtain for free. For example, participating individuals might purchase the food they eat instead of obtaining it free from a friend, relative, soup kitchen, or food pantry. This possibility is consistent with the finding that, relative to nonparticipants, FSP participants get more of their food from food stores and less from "other sources." In addition, if purchased food is wasted or consumed by nonhousehold members, then an effect of participation on expenditures (and availability) would not necessarily translate into an effect on intake.

A second reason why FSP participation might not lead to a positive effect on nutrient intake may be that participants purchase more expensive forms of the same foods than nonparticipants. For example, with the additional resources available, FSP participants may select brand-name foods rather than generic foods at stores. They may also purchase more convenient ready-to-eat foods rather than basic staples to use as ingredients in foods they prepare themselves.

Future Directions for Policy/Research

Additional research is needed to address several issues raised in this report. Future research should attempt to use a variety of approaches to determine whether selection bias influences estimated program effects. With better data, for example, studies may be able to more precisely control for individuals' economic circumstances than was possible in this study. Additional data may also allow researchers to develop appropriate "identifying variables" that are correlated with participation but not with dietary intake, as part of a strategy to address the selection bias issue econometrically. Future research should also address the question of how FSP benefits influence households' overall expenditures. Most studies of the effects of FSP on food expenditures are based on relatively old data collected at a time in which the FSP had different program rules. Thus, research should examine the current effects of FSP participation on food expenditures and should also estimate the effects of participation on household spending on nonfood goods and services.

The analysis in this report provides circumstantial evidence that there is a role for increasing efforts to provide nutrition education and promotion among participants. The study finds that participants have "moderate" levels of nutrition knowledge--they are aware of some key aspects of the link between nutrition and health and of what constitutes good nutritional practices, but they also are unaware of other key pieces of nutritional information. Assuming that a link exists between nutritional knowledge and dietary intake (an assumption supported in part by empirical evidence based on prior research), then continuing the existing program efforts at promoting nutrition education among participants may lead to an improvement in the nutritional quality of participants' dietary intake.

This study, as well as previous research, shows that additional economic resources provided by FSP benefits alone may not substantially change participants' dietary intake. However, these additional resources, which increase participants' food-purchasing power, supported by nutrition education aimed at helping participants make more informed food choices, may provide participants with the tools and strategies to improve their nutritional intake and dietary quality.