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Food Consumption and Nutritional Status of Low-Income Households

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In response to continued interest in determining the effectiveness of the food assistance programs, ERS researchers recently took a close look at the Food Stamp Program (FSP). This program supplied \$11.1 billion in stamps to approximately 21.6 million people in 1983—nearly 1 out of every 10 Americans.

ERS researchers found that the FSP increases food expenditures and improves the nutritional status of participant households. The magnitude of the FSP effects, however, depends on household characteristics.

The question of FSP effectiveness stems from two aspects of program operation. First, there is no stipulation on the types of foods that can be purchased with food stamps. They can be used to buy any domestic food or plants and seeds to grow food. Therefore, participants may not be choosing foods that enhance their nutritional status. Second, some households may use their stamps in place of income that would have been spent for food. The effect on food expenditures, then, may range from no increase to a rise by the full amount of program benefits.

Food Expenditure Patterns

As the first step in analyzing FSP effectiveness, ERS researchers considered differences in the amount spent for food at home by two categories of low-income households responding to the 1979-80 Nationwide Food Consumption Survey (NFCS)—those participating in the FSP and those eligible, but not participating. These two groups were further divided to determine differences in food spending patterns by race. Thus, four groups were considered: white FSP households; nonwhite FSP households; white eligible, but nonparticipating households; and nonwhite eligible, but nonparticipating households.

ERS researchers compared households within the same FSP status category and found that among participants, nonwhite households spent nearly \$26 a month, or 36 percent, more on meat and protein products, but \$9 a month, or 50 percent, less on dairy products than white house-

holds (figure 1). Monthly expenditures on fruits and vegetables differed by \$2.70, or 9 percent, with nonwhite FSP households spending more. White FSP households spent \$1.33, or 6 percent, more per month on breads and grains, and \$7.52, or 23 percent more on miscellaneous foods such as fats and oils, sugars and sweets, and nonalcoholic beverages.

Food expenditures also differed substantially by race among households eligible, but not participating in the FSP. Nonwhite households in this category spent about \$7, or 9 percent, more a month than their white counterparts on meat and protein products, but about \$11, or 62 percent, less on dairy products. Nonwhite households also spent about 47 percent, or \$15 a month, less than white eligible nonparticipating households on

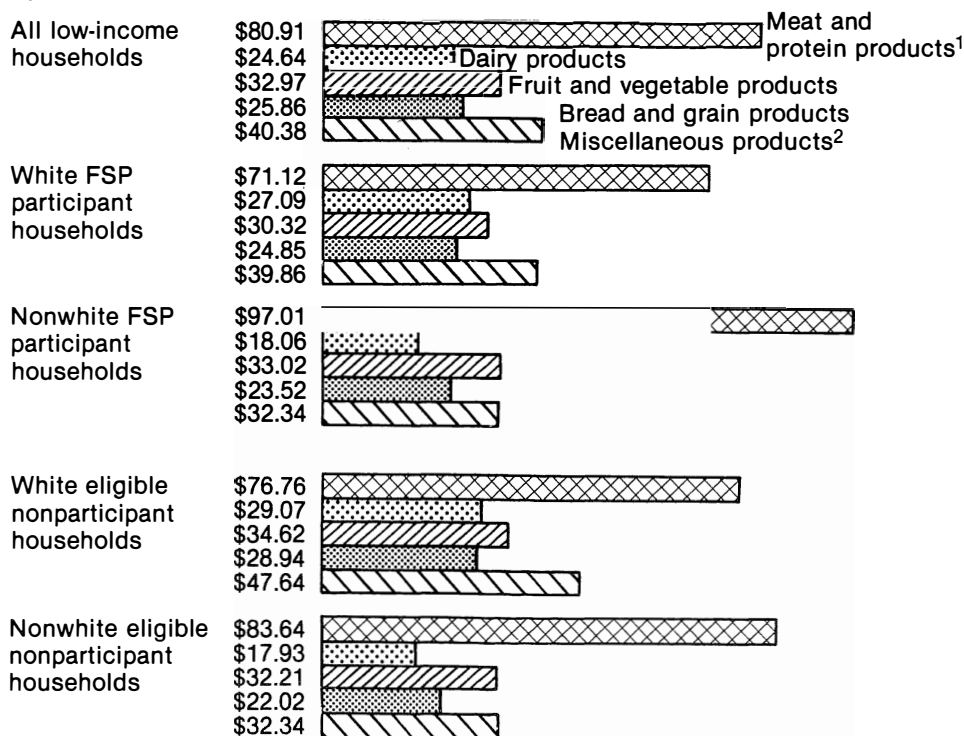
miscellaneous foods. Other differences in expenditures included \$2.41, or 7 percent, for fruits and vegetables, and \$6.92, or 31 percent, for bread and grains. White FSP households spent more for both groups of products.

The differences in food expenditures between whites and nonwhites may be due to food preferences associated with traditional eating habits. Furthermore, the high incidence of lactase deficiency among blacks, Native Americans, Asian Americans, and other nonwhites may explain their lower expenditures for dairy products. Lactase is an enzyme which is necessary to digest milk sugar.

The ERS researchers also compared households of the same race, but different FSP status. Among white households, eligible nonparticipants spent more

Figure 1

Average Monthly At-Home Food Group Expenditures by Low-Income Households, 1979-80



¹Includes poultry, fish, eggs, nuts, and peanut butter.

²Includes fats and oils, sugar and sweets, nonalcoholic beverages and condiments.

Source: Estimated from statistical analysis of the 1979-80 low-income supplement to the Nationwide Food Consumption Survey.

for each of the five major food groups (figure 1). The differences ranged from \$7.78 per month, or 20 percent, more for miscellaneous foods to \$1.98, or 7 percent, for dairy products. Among nonwhite households, participants spent more, for all categories except miscellaneous foods, where expenditures were the same. The largest difference—\$13.37 a month—was for meat and protein products. This amounted to a 16-percent difference between expenditures by nonwhite participant and nonparticipant households.

Some of the variation in food expenditures between participant and eligible nonparticipant households, especially among whites, may be due to differences in household size. White households participating in the FSP averaged 3.0 persons, compared with 3.7 persons in eligible, nonparticipating households. The number of persons in nonwhite households was about the same for participants and eligible nonparticipants, 3.6 persons and 3.5 persons, respectively.

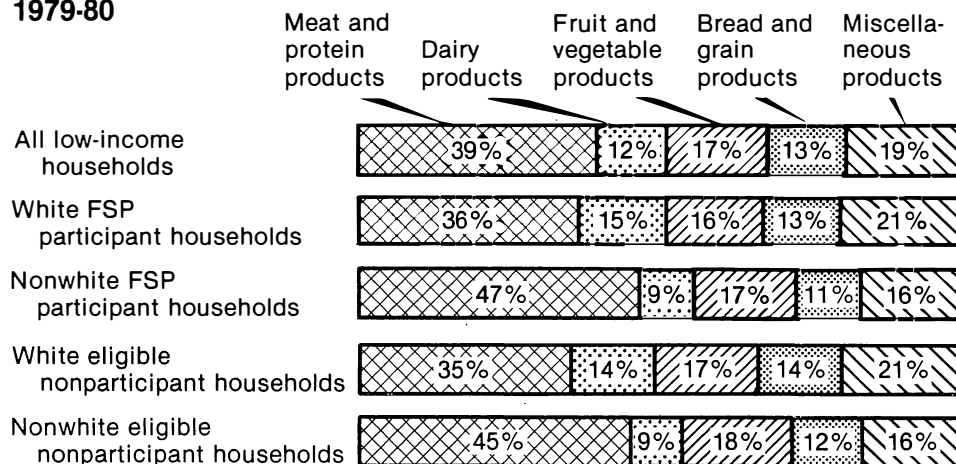
While the dollar value of food expenditures differed among the four categories of households, there are many similarities in the shares of the food dollar allocated to each food group. In general, within the same racial category, participating and eligible nonparticipating households allocated their food-at-home dollar in the same way (figure 2). However, white and nonwhite households, regardless of their food stamp status, allocated their food dollar differently. White households, on the average, spent a higher proportion of their food-at-home dollar on dairy products and miscellaneous foods, and a smaller proportion on meat and protein products, than nonwhite households (figure 2). Percentages of food-at-home expenditures allocated to fruits and vegetables and bread and grains were nearly identical.

Nutritional Status

To gauge the nutritional status of low-income households, ERS researchers used nutrient adequacy ratios (NARs) which express the nutritive value of food

Figure 2

Allocation of the At-Home Food Dollar by Low-Income Households, 1979-80



Source: Estimated from statistical analysis of the 1979-80 low-income supplement to the NFCS.

used in NFCS households as a percentage of the Recommended Dietary Allowances (RDAs). The RDAs are estimates of levels of nutrient intake for healthy people developed by the Food and Nutrition Board of the National Research Council. The Food and Nutrition Board periodically updates the RDAs to reflect the latest scientific evidence about nutritional intake. A NAR greater than 1.00 means that household members, on average, consumed more than the recommended amounts, while a ratio below 1.00 indicates that they consumed less than the RDAs.

Because large nutrient consumption by some households could distort the results, a cut-off point of twice the RDAs was adopted for the ERS analysis. Therefore, households whose consumption of any nutrient equaled or exceeded this amount were assigned a NAR of 2.00.

Furthermore, in measuring the effect of the FSP on nutritional status, the ERS study concentrated on five nutrients—vitamins A and C, riboflavin, calcium, and iron. Previous surveys, such as the 1968-70 Ten-State Nutrition Survey and the 1971-72 Health and Nutrition Examination Survey (HANES), indicated that these are the nutrients most likely to be

consumed in inadequate amounts by the low-income population.

The NARs for low-income households, on average, show that consumption of the five selected nutrients ranged from 74 percent above the RDAs for vitamin C to 16 percent above for calcium (table 1). The NARs for FSP and eligible nonparticipating households were about the same, except for calcium. Calcium consumption averaged 33 percent above the RDA for white FSP households, compared to 17 percent above for white households who were eligible, but not participating in the FSP. Milk products are a major source of calcium; therefore, it is not surprising that nonwhite households, on average, had much lower calcium adequacy ratios—only 6 percent above the RDA for participants and 1 percent above for eligible nonparticipants.

Average nutrient adequacy ratios can hide nutritional problems. For example, some households may fall below the RDAs, while others exceed them. Among low-income NFCS households, for instance, the proportion consuming below the RDAs ranged from 8 percent below for riboflavin to 40 percent below for calcium (table 2). Since the RDAs are guidelines and not requirements, con-

Table 1. Average Nutrient Adequacy Ratios¹

Nutrient	Food stamp households			Eligible nonparticipant households	
	All low-income households	White households	Nonwhite households	White households	Nonwhite households
Vitamin A	1.52	1.53	1.57	1.48	1.51
Vitamin C	1.74	1.75	1.77	1.71	1.78
Riboflavin	1.67	1.75	1.66	1.68	1.50
Calcium	1.16	1.33	1.06	1.17	1.01
Iron	1.42	1.49	1.41	1.39	1.37

¹Nutrient adequacy ratio is the percentage of the Recommended Dietary Allowance (RDA) which is met by the household's consumption of a specified nutrient. For example, a household whose consumption of vitamin A is equal to the RDA for that nutrient would have a vitamin A adequacy ratio of 1.00. Because large consumption by some households could distort the results, the nutrient adequacy ratio for each nutrient was truncated at 2.00 for all households whose consumption exceeded twice the RDA.

Source: Estimated from statistical analysis of the 1979-80 low-income supplement to the Nationwide Food Consumption Survey.

sumption below them does not necessarily indicate an inadequate diet. However, the risk of having an inadequate diet does increase as consumption falls below recommended levels.

Eligible nonparticipants were more likely than FSP households to fall below 100 percent of the RDAs, with vitamin C the only exception. The largest differences occurred among nonwhite households where about 48 percent of the FSP households were below the RDAs for calcium, compared to about 61 percent for eligible nonparticipants. The results were similar for riboflavin, with about 9 percent of participants falling below the recommended levels, versus almost 21 percent of eligible non-FSP households.

While nutritional status of low-income households didn't vary substantially by race, a higher percentage of nonwhite households fell below 100 percent of the RDAs. The largest difference was again for calcium consumption, where about one-fourth to one-third of white households were below the RDAs, compared to half to three-fifths of nonwhite households.

The RDAs contain a safety margin to provide a buffer for physical and emotional stress that could affect the need for

nutrients. Therefore, two-thirds of the RDAs is often used to differentiate between adequate and poor diets.

Using this level, ERS researchers again examined the diets of households according to food stamp program participation and race. Though small, there were differences in the adequacy of the diets of food stamp households and eligible nonparticipant households. Approximately 8 percent of the participant households fell below 67 percent of the RDAs for vitamin A, compared to 7 percent of eligible nonparticipant households. Similarly, 8 percent of the participant and 6 percent of the eligible nonparticipant households fell below 67 percent of the RDA for iron. About 2 percent of both types of households were below the 67 percent level for riboflavin.

The opposite pattern emerged for calcium and vitamin C, with a greater proportion of eligible nonparticipant households consuming inadequate levels. About 19 percent of these households consumed less than 67 percent of the RDA for calcium; 6 percent were below for vitamin C. The corresponding numbers for participant households were 17 and 4 percent.

Among white households, eligible nonparticipants were more likely to have poor diets based on their at-home consumption of the five nutrients included in the ERS study. The only exception was iron, where 8 percent of the participant house-

A Note on the Data

The ERS study is based on analysis of data from the 1979-80 supplement to the Nationwide Food Consumption Survey (NFCS). From November 1979 through May 1980, about 3,000 households either participating or eligible to participate in the FSP were interviewed about the kinds, quantities, and costs of food and beverages used during the week prior to the interview. These households were representative of low-income households in the 48 contiguous States.

The NFCS measures only food consumed at home, necessitating several adjustments in the data to make valid comparisons across households. First, the nutrient levels of NFCS households, calculated by nutritionists at USDA's Human Nutrition Information Service (HNIS), were based on the edible portion of food from the at-home food supply. Then, in order to compare the nutrient levels to the RDAs, an adjustment was made for the number of meals eaten away from home. This was necessary because the RDAs are based on total food consumption. The nutrient adequacy ratios developed for the ERS study also reflected adjustments for differences in composition of households, since the RDAs vary according to age and sex.

Finally, although nutritionists adjusted for vitamins lost during cooking, the nutrient levels for many households may still be somewhat overstated since no allowance was made in the NFCS for food waste. The nutrient content of diets, then, includes usable nutrients in discarded foods, such as fat trimmed from meat, as well as leftovers fed to animals.



holds fell below two-thirds of the RDAs, compared with 4 percent of the eligible nonparticipant households.

Nonwhite participant households were more likely than their eligible, but non-participant counterparts to fall below 67 percent of the RDAs for vitamins A and C, and riboflavin. Conversely, nonwhite eligible participants were more likely to have calcium and iron adequacy ratios below 67 percent of the RDAs.

Impact of the Food Stamp Program

The preceding comparisons, while highlighting differences in food expenditures and nutritional status of food stamp participants and eligible nonparticipants, do not explain the effects of the FSP. Therefore, ERS researchers developed regression models to estimate the impact of the FSP on food expenditures and nutrient levels. These models controlled for differences in income, region, urbanization, household characteristics, and other factors that influence food consumption.

The results show that participation in the FSP tends to significantly increase total at-home food expenditures, and at-home expenditures for meats and protein products, and fruits and vegetables. Not surprisingly, the study also found that the FSP is more effective in raising food expenditures for some groups of households than others. As household size increases, for example, a greater proportion of the discretionary income freed by participation in the FSP is spent to purchase additional food. This effect was significant for expenditures for all food-at-home, as well as for at-home dairy, bread and grain, and miscellaneous foods. For example, the results indicate that given a \$1 increase in weekly food stamps, a white, three-member household in the central city would increase its at-home food purchases by 28 cents, while a similar household with six members would increase food purchases by 36 cents. Similarly, for a three-person household, 2 cents of each \$1 increase in food stamps would be spent for additional dairy purchases, 2 cents for more bread and grain purchases, and 4 cents for additional miscellaneous food purchases. These results are cited

Table 2. Proportion of Low-Income Households with Nutrient Levels Below the Recommended Dietary Allowances

Nutrient	Food stamp households		Eligible nonparticipant households		
	All low-income households	White households	Nonwhite households	White households	Nonwhite households
	Percent				
Vitamin A					
Below 100% RDA	20.14	20.33	15.44	21.83	22.73
Below 67% RDA	7.64	7.62	8.52	8.65	5.00
Vitamin C					
Below 100% RDA	10.15	10.76	9.94	9.90	9.73
Below 67% RDA	4.95	3.90	4.47	6.36	3.47
Riboflavin					
Below 100% RDA	8.05	4.57	8.70	5.16	20.62
Below 67% RDA	2.02	0.89	3.86	1.25	3.42
Calcium					
Below 100% RDA	40.31	27.43	48.15	37.77	60.69
Below 67% RDA	17.93	11.96	21.79	16.16	28.10
Iron					
Below 100% RDA	20.62	17.67	25.71	18.09	26.90
Below 67% RDA	6.97	7.89	8.02	4.36	10.89

Source: Estimated from statistical analysis of the 1979-80 low-income supplement to the Nationwide Food Consumption Survey.

because they were statistically significant. Corresponding numbers for a six-person household are 4 cents for dairy products, 4 cents for bread and grain products, and 6 cents for miscellaneous foods. These purchases would not have been made in the absence of the FSP. In calculating these impacts, it was assumed that these households had a weekly income of \$97 and received \$14 a week in food stamps. These are, in fact, the average values for the NFCS respondents.

Food stamps had a significantly greater impact on spending for dairy products and miscellaneous foods by households at the lowest income levels, but lost effectiveness with increasing income. In fact, households with weekly incomes above \$187 spent no additional food stamp dollars for dairy products or miscellaneous foods.

The ERS findings suggest that food stamps are significantly more effective in raising total at-home food expenditures and those for dairy products, fruits and vegetables, and miscellaneous foods by white than nonwhite households. Further, FSP participation has a stronger impact on total at-home food expenditures and at-home food purchases of meat and protein products, fruits and vegetables, and bread and grains for central city households than for suburban or nonmetropolitan households.

Participation in the FSP resulted in a small, but statistically significant, improvement in the nutrient adequacy ratios of the five selected nutrients. For example, a \$10-a-week increase in food stamps, on average, would increase iron adequacy by 0.07. For every additional \$10 increase in food stamps per week, calcium adequacy would rise by 0.05, riboflavin and vitamin A adequacy by 0.04, and vitamin C adequacy by 0.03.

The ERS study found that food stamps were most effective in improving nutrient adequacy of small households. Moreover, food stamps were significantly more effective at very low household income levels in improving nutrient adequacy ratios

for vitamin A, riboflavin, and iron. The impacts of the FSP on nutrient adequacy ratios did not vary significantly by race or urbanization.

The ERS study suggests that as food assistance policy is developed, it is important for policymakers and food program administrators to be aware of the impact of the FSP on different segments of the low-income population. For example, the Omnibus Budget Reconciliation Act of 1981 limited FSP eligibility to households whose gross income is at or below 130 percent of the poverty level established by the Office of Management and Budget (OMB), eliminating some higher income households from the FSP. The results of the ERS study, then, would suggest that, because households with relatively high incomes benefit least from the FSP, imposing this new limit likely raised the overall effectiveness of the program in terms of raising food expenditures and nutrient levels.

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