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## ECONOMIC IMPLICATIONS OF THE NEW FOOD STAMP PROGRAM ON SELECTED FOOD COMMODITIES

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The present legal authority for the Food Stamp Program (FSP) is the Food and Agriculture Act of 1977. The legislation includes a thorough overhaul of the FSP which was enacted into law in 1964. The most significant impact on both participation and the food industry is the elimination of the purchase requirement that participants pay for food stamps. Under the new legislation, participants receive food stamps free of charge such that the benefits received are roughly equivalent to the value of bonus stamps under the old program (7).

Previous studies generally concur that participation in the FSP increases

household food purchases (4, 5). However, there is some consensus in research evidence that suggests the food stamp purchase requirement has been a significant barrier to program participation for many eligible households (1, 6). Since the new legislation took effect January 1, 1979, the enrollment of food stamp participation has swelled from 15.9 million people in December 1978 to over 19 million in May 1979. Consequently, the administration had to ask Congress to appropriate 650 million dollars in supplemental funds over and above the 6.2 billion dollars already earmarked for the fiscal year to keep benefits flowing to FSP recipients.

What kind of economic impact can one expect from directing a greater amount of Federal dollars to a larger number of the nation's poor? The FSP participant households as a group will be able to purchase not only more food but more of other commodities as well. The money that participants would have used to purchase food stamps will be freed for other uses by the new legislation. In fact, less may be spent for food under the new program than the previous program containing a purchase requirement.

The objective of this study is to provide an economic analyzation of the food stamp program in order to draw implications of the new FSP on selected food commodities. The effects of FSP transfer income on household's at-home food expenditure patterns for major commodity groups are statistically estimated using the 1972-73 Consumer Expenditure Dairy Survey (CEDS) data. Although existing household survey data are inadequate for assessing the full extent of the impact of the new FSP on household purchasing behavior, estimates of the food expenditure relationships of FSP households prior to the change of the program are presented. From these relationships, the possible effects and implications of the new program are discussed.

### Methodology

This study conceptualized an income effect and a price effect on FSP households' food purchases. This is in contrast to previous studies that recognizes only the income effects (3, 4). In the case where a pure income effect is applicable, the result of the participation in the FSP is to expand the household's food purchases by amounts consistent with the income elasticity of demand for food. Thus, if FSP recipients were alternatively given a transfer of income equivalent to the value of food stamp subsidies, their equilibrium level of food purchased and the level of utility attained would not change.

Though a price effect is relevant, its impact has not been properly noted and distinguished from the pure income effect. Theoretically, if the FSP household purchases no more than the maximum amount of food purchasable with food stamps, then the price effect of food stamp transfer income on household food purchases has two components; namely, substitution and income effects. In this case, a food stamp subsidy is equivalent to a decrease of average price of food to an eligible household. Consequently, the increased food purchases due to the price effect should be analyzed in terms of amounts purchased due to substitution and income effects, respectively. Empirical models that do not make provisions to distinguish a pure income effect from a price effect are likely to be misspecified and the impact of the FSP will be measured inaccurately.

The statistical model to be estimated is derived from the theoretical considerations. In order to empirically estimate the theoretical model, an empirical criterion is used to classify the sample into two subgroups capturing the two effects for statistical analysis. The criterion employed is whether or not the household's food purchases are greater or equal to the maximum amount of food purchasable with food stamps. By allowing both intercept and slope shifters, one equation is estimated for each food commodity. Thus, the statistical model is represented by (1)

$$FE_{ij} = f(I_i, B_i, S_i, I_i \times S_i, B_i \times S_i, SE_i) +$$

$e_{ij}$  where  $FE_{ij}$  is the  $i$ th household

food expenditure for  $j$ th food item.  $I$  represents household income.  $B$  represents value of bonus food stamps received by the household.  $S$  is a dummy variable such that  $S=1$  if the household's total at-home food expenditure is less than the maximum amount of food purchasable with food stamps, and  $S=0$ , other-

wise. SE denotes a vector of other socio-economic characteristics of the household, such as household size, age, and location.

Average food purchases for the total market population represents both the average household purchases and participation rate. Analysis of household food purchasing behavior should take both into account. Tobit analysis, a statistical method pioneered by James Tobin, is designed to estimate such a model that contains a number of zero values for the dependent variable (8). An important aspect of Tobit analysis is that it takes into account the sample information supplied by the nonpurchasing households as well as the purchasing households. In particular, the Tobit analysis provides not only probable changes in the magnitude of the dependent variable if it is already above the limit, but also changes in the probability of being above the limit.

Data utilized in the empirical analysis comes from the 1972-73 Consumer Expenditure Dairy Survey. The sample used in this study contains only those respondents that participated in the FSP. Nine categories of at-home food expenditures were included for analysis.

### Results and Conclusions

Because of space and time limitations, instead of presenting the detailed statistical results of Tobit analysis for each selected food category, this section provides a general discussion of the empirical results. Overall, the regression model suggests that the intercepts are significantly different between the two groups of FSP households. The slopes of income and bonus value variables are also significantly different between the two groups in most food categories. Results suggest that household income, value of bonus stamps, household size and race of household head are the most important factors that affect at-

home food expenditures. Age of household head is a significant variable in explaining variation in food expenditures for fruits and miscellaneous prepared foods. At-home food expenditure for fruits is positively related to the age of household head, while expenditure for miscellaneous prepared foods is negatively related to the age of household head. Variables that represent the location of the households, however, have no significant impacts on at-home food expenditures. The effect of urbanization has a significant negative impact on expenditures for sugars and sweets, and fats and oils, but positive impact on expenditure for fruits. Female-headed households tend to purchase more cereal and bakery products and less sugars and sweets than do male-headed households. Educational level and employment status of housewife in general does not significantly influence the household purchases of most food categories.

Most significantly, the results indicate that sharp contrasts exist between the two groups of households in terms of their responses to household income and supplemental income from the FSP. For the group of households which purchase more food than maximum food purchasable with food stamps (group 1), the results suggest that value of transfer income is complementary to their household income, except for meat products and fruits. Thus, the additional purchasing power derived from the FSP appear to positively expand their food purchases. However, the income effect was found to be negative but not significant for meat products and bonus effect was found to be negative but not significant for fruits. These latter results suggest that FSP households tend to substitute income and bonus value for one another when purchasing meat products and fruits.

In contrast, FSP households that purchase less food than maximum food purchasable with food stamps (group 2)

tend to exhibit a food expenditure pattern that suggest income from different sources are substituted for each other in purchasing food for at-home consumption. In general, purchases of cereal and bakery products, fruits, vegetables, sugars and sweets, non-alcoholic beverages, and miscellaneous prepared foods tend to decrease and increase, respectively, as household income and value of bonus stamps increase. Therefore, while the FSP was effective in increasing participant households' food expenditure on those food categories, its effectiveness was partly offset by the negative income effects for those food items. One logical explanation would be that these households have a relatively higher degree of affinity for nonfood items. Thus, instead of an income complementary effect, an increase of food stamp subsidy has an income substituting effect which allows the participating household to purchase food at lower cost and frees some of their food dollars to be spent on nonfood items.

These findings are in agreement with results of previous studies. For example, one study reported that food stamp households substituted a larger proportion of their increased food purchasing power for expenditures on items other than food (2). Another study also concluded that part of the bonus effect on expanding food expenditures of FSP household was offset by a negative effect of bonus and income interaction (4). For dairy products and fats and oils, the value of bonus stamps received by FSP households appears to be complementary to their household income. Nevertheless, the results suggest that the impact of food stamps transfer income on purchasing of meat products is negative rather than positive as one might expect. Thus, a common assertion that FSP households spend their additional food dollars on some luxury food items such as steaks does not seem to be supported by the sample evidence.

### Implications

Food expenditure elasticities with respect to household income and value of bonus stamps computed from Tobit analysis are presented in Tables 1 and 2, for households belonging to group 1 and group 2, respectively. For all products, expenditure response is relatively small for changes in income. As shown in these tables, income subsidies derived from the FSP proved to be strongly devoted to increasing purchase of food for at-home consumption more so than did household income. As shown in Tables 1 and 2, elasticity measures obtained from Tobit analysis were decomposed into two rather useful interpretations. One is the elasticity pertaining to changes in food expenditures for households actually purchasing a particular food item. The other is to measure changes in the probability of participating in the market place. Given these elasticity measures, economic implications of the results can be readily assessed.

One important implication is that elasticities derived from sample data that measure only the actual purchasing of a food item will significantly underestimate the total market response. The degree of underestimation is directly related to the number of households that participate in the market place. Therefore, for a commodity that only few households report a purchase, the magnitude of the underestimation will be relatively large. For example, the underestimation amounted to about two-thirds of the total elasticity for sugars and sweets, fats and oils (Table 2).

The interpretation of these elasticity measures is straight-forward. For example, Table 1 indicates that for a 1% increase in average household income, household food expenditure for dairy products will increase by 0.169%. Whereas, 0.037 percentage points of that total adjustment was due to the increase in the probability of being in the market

Table 1. Income and Bonus Elasticities for Group 1 FSP Households.

Food product	Income Elasticity		Bonus Elasticity	
	Total	Due to actual purchases to probability	Total	Due to actual purchases to probability
Meat products	-0.014	-0.013	0.174	0.159
Dairy products	0.169	0.132	0.143	0.111
Cereal and bakery products	0.027	0.024	0.293	0.258
Fruits	0.186	0.121	-0.047	-0.030
Vegetables	0.095	0.071	0.313	0.235
Sugars and sweets	0.038	0.019	0.501	0.255
Fats and oils	0.189	0.098	0.266	0.138
Non-alcoholic beverages	0.003	0.002	0.186	0.132
Miscellaneous prepared foods	0.145	0.090	0.358	0.222
				0.015
				0.032
				0.035
				-0.017
				0.078
				0.246
				0.128
				0.054
				0.136

Table 2. Income and Bonus Elasticities for Group 2 FSP Households.

Food product	Income Elasticity		Bonus Elasticity	
	Total	Due to actual purchases to probability	Total	Due to actual purchases to probability
Meat products	-0.125	-0.065	-1.230	-0.120
Dairy products	0.007	0.004	0.078	0.040
Cereal and bakery products	-0.100	-0.060	0.073	0.044
Fruits	-0.771	-0.301	0.484	0.189
Vegetables	-0.196	-0.084	0.220	0.095
Sugars and sweets	-0.068	-0.022	0.136	0.044
Fats and oils	0.076	0.024	0.308	0.099
Non-alcoholic beverages	-0.175	-0.077	0.245	0.108
Miscellaneous prepared foods	-0.457	-0.178	1.398	0.545

and purchasing dairy products, and 0.132 percentage points was due to variations in expenditures of those households already purchasing dairy products.

By comparison Tables 1 and 2 indicate that changes in household income or transfer income derived from food stamps affect the two groups of households quite differently. For group 1 FSP households, this implies that changes in income or bonus value primarily affect the magnitudes of their expenditures rather than market participation. For example, given a 1% change in bonus value, 78% of the total change in expenditure for dairy products would be generated by increasing purchases, whereas 22% would result from changes in the probability of being a purchasing household instead of a non-purchasing household (Table 1).

On the contrary, for group 2 FSP households, the effects of changes in income or bonus value influence the household's decision of whether or not to purchase a food item more than its decision to increase or decrease the amount to be purchased as compared with group 1 FSP households. Using dairy products for example in Table 2, only 51% of the total elasticity with respect to changes in bonus value is due to expenditure changes; whereas, 49% is attributed to changes in the probability of purchasing in the first place.

Although the applicability of the results to the new FSP program, which eliminates the purchase requirement, is limited by the nature of the available data, some tentative implications may be drawn from this analysis. Under the new legislation, the distinction between the pure income effect and the price effect, however, no longer exists. Only a pure income effect would be appropriate and, therefore, suffices to describe the impact of food stamp availability. The low income households that are eligible for receiving food stamps free of charge would tend to use the additional pur-

chasing power to augment their food purchases. Among the commodity groups, purchase of sugars and sweets, miscellaneous prepared foods, vegetables, and cereal and bakery products are most likely to increase by a substantial amount. The implication of the increased purchases of, particularly, sugars and sweets, and cereal and bakery products suggest that FSP participants should be educated to be aware of the nutritional value of food items purchased for at-home consumption. Although the results indicate no consistent significant regional effects on the food purchases pattern, the food industry in the southern region of the United States is likely to be the most strongly affected under the new program. In the South, where the poverty rate is the highest among all regions, increased Federal aid to the eligible low income households should substantially favor the food industry in that region.

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## ALTERNATIVE ACTION OPPORTUNITIES FOR THE FOOD INDUSTRY TO BETTER SERVE THE HOUSEHOLDS OF THE AGED AND AGING

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### Introduction

There are many unanswered questions regarding the interaction of the elderly and the food marketplace. Do they encounter unique problems in food stores because of their age? How satisfied are they with products and services, package sizes and store facilities? What changes would they like to see take place? The research represented by this report addresses these and other questions and provides insight into ways in which the food industry can better meet the elderly's needs and prolong their independence in the marketplace.

### Research Objectives

The goal of this research project was to enhance the quality of life for

the elderly by improving their food shopping and consumption experiences.

More specifically, this project pursued the following objectives:

1. To identify the food shopping problems experienced by the elderly.
2. To identify key grocery product modifications and service adjustments that would minimize the food shopping problems of the elderly.
3. To determine the justifying circumstances for product modifications and service additions.
4. To develop specific priority actions and recommendations for the food industry.