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Impacts of the Food Stamp Program on Value of Food Consumed and Nutrient Intake among Washington Households with 8-12 Year Old Children

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Food stamp participation increased the value of food consumed by the household but had no significant effect on nutrient intake of the 8-12 year old child. Liquid assets increased the value of food consumed for eligible non-stamp recipients but had little effect on participants' food consumption. Physiological need levels were higher for food stamp recipients than for nonrecipients. This need level was positively related to value of food consumed. An important implication of the results is that issuance of only bonus stamps may decrease the demand for food.

From its beginning as a pilot program in 1961, the Food Stamp Program (FSP) has developed into a major transfer program with Federal outlays exceeding \$5 billion in fiscal year 1977. In that year, the FSP increased the food purchasing ability of approximately 17 million low-income participants by providing each person with an average of over \$24 per month in bonus stamps. These stamps subsidize the purchase of food giving eligible households the opportunity to obtain nutritionally adequate diets. Eligibility for the program depends on a household's income and assets and those able must meet a work requirement. Specific amounts of benefits in the form of bonus stamps are determined by the household's size and income.

With the rapid growth of the FSP, accurate descriptions or profiles of eligible households have not been readily available, particularly

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for those who do not participate in the program. Few attempts have been made to determine how the food purchasing behavior of participating households differs from that of nonparticipants. Information on how nutrient intake is affected by participation in the FSP is even more sketchy.

The research reported here was designed to meet some of this informational need using 1972-73 data collected in the State of Washington. The demand for this information continues even though changes or modifications in the FSP take place. Evidence about the impacts of food stamp participation on food purchases is useful to assess the implications of elimination of the FSP purchase requirement (effective July, 1978).¹ The need for more information on linkages between the monetary value of food and nutrient intake has increased with the added emphasis on nutrition in USDA food policies.

Previous in-depth analyses of both food expenditure and nutrient intake relationships have identified some positive aspects of the FSP. From their study of two rural counties

¹Elimination of the purchase requirement means that instead of paying X dollars and receiving X + Y worth of food stamps, recipients will be given X dollars worth of food stamps.

in Pennsylvania, Madden and Yoder concluded that food stamps provided some improvement in food purchasing ability and nutrient intake among households lacking funds near the end of longer pay periods. Sylvia Lane's study in Kern County, California, indicated that use of food stamps resulted in significantly higher intakes of 4 of 10 nutrients for FSP participants relative to those for nonparticipants. However, the differences were small and nonparticipants had higher intakes of vitamin C than did participants.

Earlier work by West and Price using the State of Washington data identified a direct relationship between the amount of bonus stamps received and the value of food obtained by a participating household. However, that effort did not isolate the set of eligible nonparticipants, nor were interactions among FSP participation and other socioeconomic characteristics of the household investigated. The study reported in this paper incorporated these extensions of the analysis as well as a psychological variable which measures the concern of the adult female for the physiological well-being of her household. Differences in nutrient intake between FSP participants and nonparticipants are also presented.

Model Formulation

To evaluate the effect of food stamp participation on the value of food consumed a model was formulated that included value of food as the dependent variable and food stamp participation plus various socioeconomic and a psychological variable as explanatory variables. The "in kind" aspect of the food stamp transfer stimulates expenditures on food and restricts nonfood expenditures. Therefore, one would expect that with all other variables held constant, food stamp participation would increase the value of food consumed.

Participation in the FSP was entered as a dummy variable. This specification interprets the decision to participate as a discrete act which simply shifts the relationship between

value of food and other determinants upward or downward along the intercept axis. The total value of food stamps and not the value of bonus stamps is the relevant variable affecting value of food obtained. The total value of the food stamp allotment does not vary with income. It varies only by household size and, therefore, on an adult equivalent basis it is constant.² This specification should isolate the "in-kind" effect of stamps that can be used only for food purchases.

Current income was included as an explanatory variable. This variable includes earnings of all household members and transfer payments from social security, veteran's programs, alimony and child support, USDA free commodity programs and gifts. Income was placed on an adult equivalent basis and measured in natural logarithms to allow for decreasing rates of food consumption as income increased.³ Two components of income, food stamps and free school lunches, were specified separately to identify their individual effects on food procurement behavior.

Length of pay period was used to represent households' ability to allocate money over time when cash reserves are low. Liquid assets per adult equivalent were also used to measure the households' ability to purchase food when cash reserves are low. These assets may also measure the amount of cash households have left over to allocate to more expensive food items. On the other hand, liquid assets may be temporarily held to make a downpayment on a house or to purchase other major durable goods, or they may be held for retirement [Crockett, p. 113]. In these situations one would expect little effect

²The value of bonus stamps per adult equivalent does not vary by household size, since the income scale and the scale used for food stamp allocation by household size are the same.

³The income scale used was obtained from the Monthly Labor Review article, "Estimating Equivalent Incomes on Budget Costs by Family Type." This scale is based on the concept that differing size households with the same adult equivalent food expenditures are equally well off. Current income, liquid assets, and the value of free lunches were deflated by using the income scale.

on food expenditures. This subsample is a low income sample and one would expect from the Duesenberry hypothesis that there would be a high demand to spend any cash reserves. The households must include an 8-12 year old child which means most household heads are not near retirement age and the household is in a stage where there is a high demand for many consumption items. Therefore, it is hypothesized that liquid assets will increase food expenditures.

The natural logarithm of household size was included to pick up decreasing economies of household size not accounted for by the adult equivalent scales. Other non-controlled factors associated with ethnic status were represented with dummy variables for Blacks and Mexican-Americans. The component of home produced food with the highest value, meat, was included as a dummy variable.

The index of physiological need measures one aspect of a theory of human motivation which originated with Goldstein in 1940 and was redefined by Maslow in 1970. Human needs are seen as universal and fall into a hierarchy: physiological; safety and security; love and belongingness; self esteem; and self actualization. Once needs on one level are satisfied to a given degree, an individual moves to a higher level until self actualization is reached. At any given point, the individual is motivated to seek satisfaction of the highest need not yet met.

Physiological needs reflect a concern for basic survival and relate to physical comfort, shelter, clothing, food and other basic necessities. For most individuals in Western society, these needs are moderately well satisfied and therefore, a raw concern or desire for these necessities very seldom will exist. However, people revise their desires upward and these are still reflected in concerns for such things as creature comforts. These still relate to basic physiological needs, but, for example, the concern may now focus on a sufficient supply of nutritious and tasty food rather than on a simple desire for something to eat. Behavior may still be primarily moti-

vated by physiological needs. No need is ever totally satisfied. Until a need is satisfied to a substantial degree, the individual will remain preoccupied with this need. He or she will be unable to grow psychologically and move toward satisfaction of higher needs. A person primarily motivated by physiological needs would be expected to spend relatively more money on food and on other basic creature comforts than on items associated with higher need levels, which could include expenditures for recreational, educational or luxury items.

The instrument used in the study measured levels of the five needs relative to the remaining four. It was a modification of a Management of Motives Index, developed by Jay Hall. The respondent was given 30 cards corresponding to 6 statements for each of the 5 need levels (see Appendix A). These were sorted into 5 categories ranging from "most like me" to "least like me." A relative need level score was computed by giving the statement "most like me" a score of 25, the statement "next most like me" a score of 20, and so on.

The test of the hypothesis that FSP participants have a greater concern for physiological needs was accomplished with the inclusion of the need level score. This variable was expected to be positively associated with value of food consumed and to be stronger among participants than among nonparticipants.

The dependent variable measured the value of food consumed from purchases, home production, hunting or fishing, gifts and the food programs: food stamps, free USDA commodities and free NSLP lunches.⁴ The value of food consumed was placed on an adult-equivalent basis.⁵

⁴Home production and food from hunting and fishing were evaluated at retail prices. For example, deer and elk meat were priced as beef. The school lunch was valued at 35¢ per lunch or \$7.00 per month for 9 months. This is close to the average price of 34.3¢ paid by children above the poverty level during 1970-71. It is also similar to the cost of a sack lunch [West and Hoppe, p. 4].

⁵Unit (adult) equivalent scales were used to deflate in-

The Sample and Procedures

The sample used for this analysis is a subsample of a sample used to evaluate the school lunch program. The larger sample included 1009 observations on 8-12 year old children. The subsample includes only children from households eligible to receive food stamps (332 children). These households were identified as eligible for the FSP using selection criteria described below. There were 196 households participating in the FSP and 136 that were eligible but nonparticipating.

The data were sufficiently complete to permit the use of both income and asset food stamp eligibility tests. Monthly income was adjusted for excessive shelter, utility, medical and/or dental costs before comparison with the FSP income cutoffs in effect from July 1972 through June 1973. Total assets were reduced by the value of owned residences, one vehicle, and income-producing property. If the remaining adjusted value of assets was less than \$1500, the household was included in the data set.

Data were collected during the spring of the 1971-1972 school year and throughout the 1972-1973 school year. The sampling process consisted of 1) selecting school districts in Washington, 2) selecting schools within the district and 3) selecting children within the schools. The school districts were selected with stratification by district size and by geographic area. Weights for each stratum were proportional to the state's school population in each stratum. Districts within each stratum were drawn by probability sampling with districts with significant numbers of Blacks and Mexican-Americans given higher probabilities than others.

come, assets and value of food consumption. The food expenditure scales were estimated from the 1965 USDA Survey of Households using the technique developed by Price (1970). These were used to deflate the value of food consumed. The food expenditure scale incorporated the effects of economies of size as well as age-sex composition of the household. That is, Price estimated separate scale values for the first, second and third child of the household. The differences in scale values were incorporated into the food expenditure scale.

Representative schools within districts were drawn with the help of school district personnel. Higher probabilities of selection were given to schools with significant numbers of Blacks and Mexican-Americans. Children in the selected school were classified into 12 groups. They were categorized by ethnic group (White, Black, and Mexican-American), poverty level (above and below 125 percent of poverty) and by lunch participation (participants and nonparticipants). Subjects were drawn at random from these 12 groups. It was impossible to find sufficient numbers of subjects in some of the 12 groups. Therefore, the sample and the subsample include more Whites than Blacks or Mexican-Americans.

Weights constructed for the 12 groups are subsequently used to obtain means and proportions that are representative of the state of Washington. The sample does not include Orientals or Native Americans. In October of 1972, they consisted of 1.5 percent and 1.7 percent of the state's school population, respectively [State of Washington, 1972]. For more detail on the characteristics of the sample see Price and West (1977, pp. 1-2) and the Appendix.

Since the child is the unit of observation, households with several 8-12 year old children are more heavily weighted than those with only one such child. This sample design favored selection of larger households whose adults were generally in the middle of their life cycle. One-person and two-person households and those headed by very young adults or the elderly are generally excluded. The sample has the advantage of holding life cycle variables such as age and family composition relatively constant. Inferences and generalizations from this study are necessarily relevant to only those populations with the same characteristics.

One of the concerns about drawing inferences from cross sectional data concerning the effects of the FSP is that the food stamp recipients come from a different population than nonrecipients. If they do, the results may differ from what would be obtained from

a before and after study of recipient households. Before and after samples of sufficient size to adequately represent these populations are difficult to obtain. There were several safeguards inherent in this study to prevent this problem. First, the stage in the life cycle is held constant so that there is no difference between recipients and nonrecipients in this respect. Second, the method of sampling was the same for recipients and nonrecipients. That is, below poverty children were identified, then sampled and only after the interviews were completed was food stamp participation identified. Third, a number of variables were measured and included in the regression model which affected the value of food consumed. If the coefficients on these variables are accurate, and if no important variables that are correlated with FSP participation are omitted from the regression, then the relationship between food stamp participation and value of food consumed should be the same as that obtained from a before and after sample.

Description of Socio-Economic Characteristics

Descriptive characteristics of the participants and the eligible nonparticipants are presented in Table 1. Estimates with Blacks and Mexican-Americans weighted in proportions to their numbers in the Washington state population are presented as well as non-weighted sample values.

Bonus stamps represented less than half of the average value of stamps purchased monthly, \$137.23, by participant households. Participant households spent significant amounts for food in addition to the values of stamps, \$23.32. The value of free school lunches received was higher by about half for households also participating in the FSP. This larger amount is consistent with the higher rate of participation in the National School Lunch Program (NSLP) among children in households receiving food stamps.

Total monthly income on an adult equivalent basis is similar for participants and nonparticipants with less variation among the weighted estimates than among sample val-

ues. Earnings formed a higher proportion of the total income among nonparticipants while transfer payments were relatively more important to participants. More than one-half the participant households were headed by females in contrast to about one-fifth for nonparticipants. Occupational distributions also reflect the lower incidence of working males among households receiving food stamps.

The level of liquid assets (checking and savings accounts), while not large for either group, was significantly higher for nonparticipants. The average values of owned homes and vehicles were approximately twice as high for nonparticipants than for those using food stamps. A higher percentage of nonparticipants also owned large food freezers.

Expenditure patterns for food stamp participants show significant differences from those of eligible nonparticipants. On an adult equivalent basis, the value of food consumed by participants is about one-fifth higher. This higher outlay for food is offset by lower expenditures on unexpected, largely medical, expenses and on vehicles. In spite of differences in value of owned homes, housing costs for the two groups were about the same.

The level of physiological need was significantly higher among FSP participants than among nonparticipants. This result indicates that their need for food has been satisfied to a lower degree and, therefore, is higher than for nonparticipants. Comparisons within the 3 ethnic groups show higher physiological needs among recipients for all 3 ethnic groups. For Blacks the means were 92.5 and 90.4 for recipients and nonrecipients, respectively. For Mexican-Americans these means were 91.4 and 85.4. For Whites they were 90.0 and 86.9.

Results of the Regressions

Regression models were fitted separately for the subset of 196 participants, the subset of 135 nonparticipants, and the combined subsets of 331 observations.⁶ The analysis of

⁶One observation reporting a zero level of income was dropped.

TABLE 1. Socio-Economic Characteristics of Households Eligible for Food Stamps, St. of Washington, 1972-73

Characteristics	Sample Values			Sample Value Weighted by State's Proportion of Blacks and Mexican-Americans	
	Food Stamp Participants N = 196	Eligible Nonparticipants N = 136	Significance Level for Test Diff.	Food Stamp Participants	Eligible Nonparticipants
Ethnic Status:					
% Blacks	30.1	20.6		8.6	6.3
% Mexican-Americans	26.5	40.4	.05	8.7	14.2
% White	43.4	39.0		82.7	79.5
Mean Household Size	6.26 (2.47)	6.50 (2.08)	NS	5.49	5.93
% Households with No Adult Male	56.1	21.3	.01	60.1	22.0
Food Stamps:					
Mean Total Value/Household/Month	146.46 (42.35)	0	---	137.23	0
Mean Cost of Stamps/Household/Month	80.17 (30.98)	0	---	72.60	0
Mean Value of Bonus Stamps/Household/Month	66.29 (32.13)	0	---	64.63	0
Amount Spent in Addition to Stamps/Household/Month	28.89 (30.57)	---	---	23.32	0
Mean Value of Free Lunch/Household/Month	21.53 (13.89)	13.43 (14.68)	.01	16.81	10.90
Mean Earnings of Major Income Earner/Month	103.05 (147.61)	263.15 (195.47)	.01	78.05	279.42
Mean Welfare Payments/Month	200.05 (143.92)	43.47 (90.58)	.01	192.47	33.69
Mean Total Monthly Income/Adult Equiv.	114.93 (38.94)	104.42 (36.90)	.05	115.32	112.96
Mean Liquid Assets/Adult Equiv.	37.37 (41.96)	63.20 (76.87)	.01	45.50	75.40
Value of Home	4,037.00 (7,450.00)	8,686.00 (11,499.00)	.01	3,584.00	8,826.00
Value of Vehicles	466.00 (630.00)	931.00 (860.00)	.01	411.00	865.00
Total Assets/Adult Equiv.	1,176.00 (2,077.00)	2,429.00 (2,739.00)	.01	1,192.00	2,533.00
Value of Food/Adult Equiv.	47.26 (10.20)	39.63 (12.28)	.01	47.82	40.57
Unexpected (Medical) Expenses/Month	9.12 (28.31)	39.96 (114.15)	.01	8.94	47.00
Housing Cost/Month	84.83 (42.67)	90.99 (63.57)	NS	91.42	95.22
Vehicle Payment/Month	17.49 (37.06)	33.28 (54.15)	.01	14.78	33.00
Occupation of Major Income Earner:					
% White Collar	4.1	12.5		5.3	16.7
% Blue Collar	21.4	42.6		13.3	34.6
% Service Worker	9.2	13.2	.01	11.7	13.1
% Armed Forces	0.5	9.6		0.1	11.8

% Unemployed	58.2	16.9		60.0	19.5
% Other	6.6	5.2		9.4	4.2
Nonparticipating District - %	11.2	7.4		4.3	4.3
Full School Lunch Participation - %	73.0	63.2	.10	84.1	57.5
Partial School Lunch Participation - %	14.5	16.2		10.9	16.0
Non-School Lunch Participation - %	12.7	20.6		5.0	26.5
Free Lunch Participation - %	85.1	58.1	.01	93.3	55.7
Freezer Ownership					
% Non	66.3	42.7		64.6	41.9
% Small	13.3	8.8	.01	17.1	8.0
% Large	20.4	48.5		18.3	50.1
Index of Physiological Need	91.11	87.00	.01	90.33	86.02
	(13.06)	(13.88)			

Note: Standard Deviations in parentheses.

covariance test indicated the slope coefficients for participants differed significantly from those for nonparticipants.⁷

Income significantly influences the value of food consumed for the combined sample (Table 2). The magnitude of this effect is not large, however. The income elasticity evaluated at the mean is .07 which is similar to the .1 value found by Egbert and Hiemstra in their analysis of low-income households in the 1965 Household Food Consumption Survey. West and Price, obtained an elasticity of .04 with a larger sample which included higher income households along with the FSP-eligible ones analyzed in this study.

The income coefficients for the models estimated with the participant and nonparticipant subsets are not significant, although both are positive and result in calculated elasticities of .03 and .06, respectively. The lack of significance is likely due to less variation in income and the smaller number of observations.

The receipt of food stamps increased the value of food consumed by \$5.14 per month. This is a gain of 13 percent over the mean for nonparticipants. On an adult equivalent

basis, the mean value of bonus stamps received monthly was \$16.77, so the propensity to consume food out of \$1 in bonus stamps is .31 at the mean.⁸ This result compares with .38 obtained by Lane (p. 111). Since receipt of stamps was measured as a discrete change in the intercept, this propensity would increase as the value of bonus stamps decreases and vice-versa. For the household with a higher income receiving \$10 worth of bonus stamps, this propensity is .51. For the lower income household receiving \$24 worth of stamps it is .21.

Free school lunches were valued at approximately the average price charged to public school students in Washington in 1970-71 which is similar to the estimated cost of food in typical sack lunches sent from home [West and Hoppe]. The value of these free lunches was included in the dependent variable. Consequently, a coefficient of one implies that other food purchases were not reduced as a result of receiving free lunches while a coefficient of zero implies a reduction equal to the free lunch value. The free lunch coefficient for food stamp participants was significant with a value of .896 (Table 2). This result implies that participant households reduce their other food consumption very little when receiving free lunches. On the other hand, the coefficient for nonparticipants is small and nonsignificant implying that these households reduce other food consumption by a corresponding amount when free lunches are received.

⁷This test compares the error sum of squares of the total sample including the dummy variable for food stamp recipients to the sum of the error sum of squares from the two separate regressions. Since the former included the food stamp dummy variable, the test excluded the effects of differences in the constant terms due to receipt of food stamps. The test then becomes one of the differences in the slope coefficients between recipients and nonrecipients.

⁸The propensity to consume food out of a \$1 worth of bonus stamps was computed as $\$5.14/\$16.77 = .31$.

TABLE 2. The Effects of Socio-Economic Variables on the Value of Food Consumed, Households Eligible for Food Stamps, State of Washington, 1972-73

Independent Variables	Total Eligible for Food Stamps N = 331	Food Stamp Recipients N = 196	Non-Food Stamp Recipients N = 135
	--- Regression Coefficients ---		
Constant Term	31.871 (3.760)	42.540 (3.974)	40.839 (2.695)
Ln. Monthly Income/Adult Equiv.	3.239 (2.138)	1.391 (.713)	2.740 (1.108)
Food Stamp Recipient (Dummy)	5.145 (4.261)	---	---
\$ Value of Free School Lunch/Adult Equiv.	.513 (2.693)	.896 (3.825)	.216 (.664)
Liquid Assets/Adult Equiv.	.0266 (2.736)	-.0167 (1.083)	.0491 (3.702)
Pay Period with "Other" Excluded:			
Weekly (Dummy)	-.528 (.340)	-.385 (.212)	1.077 (.399)
Biweekly (Dummy)	-3.575 (2.333)	-1.211 (.683)	-3.770 (1.348)
Monthly (Dummy)	-4.813 (2.983)	-7.568 (3.874)	-2.362 (.852)
Pay Period with Weekly Excluded: ¹			
Biweekly	-3.047	-.826	-4.847
Monthly	-4.285	-7.183	-3.439
Other	.528	.385	-1.077
Ln. Household Size	-11.253 (6.929)	-11.164 (5.882)	-14.073 (4.487)
Home Produced Meat (Dummy)	5.175 (4.030)	7.166 (4.851)	2.471 (1.102)
Index of Physiological Need	.1228 (3.023)	.1467 (3.041)	.1030 (1.498)
Ethnic Status:			
Black	2.210 (1.591)	2.551 (1.646)	-.815 (.311)
Mexican-American	-.181 (.126)	-2.713 (1.461)	.0430 (.018)
R ²	.358	.389	.326

^aFor ease of interpretation, these pay period coefficients which use weekly pay as the excluded category were calculated from the estimates of those with "other" excluded.

NOTE: T values are in parentheses.

The coefficients for liquid assets were significant for the combined sample and for nonparticipants, but were not significant for the food stamp participants. This result was expected since recipients are "locked in" to spending the value of stamps they receive on food. Fluctuations in levels of income or liquid assets would be expected to have less effect on value of food consumed. Note that the income coefficient for participants was

also smaller than that for nonparticipants. For nonparticipants, the monthly value of food consumed per adult equivalent for a household with the mean level of liquid assets, \$63.20, would be \$3.10 higher than for a household with no liquid assets.

In the estimates for the combined sample, increases in the length of the pay period had a negative influence on the value of food consumed. Households who were paid biweekly

or monthly consumed significantly lower levels of food relative to the omitted category of "other" pay periods. Households with "other" pay periods had adults who were either self-employed or received most of their income from transfer payments. The results show the same general relationships for participants and nonparticipants but the pattern is less consistent. For participants, it is possible that as the pay period becomes longer, less cash, stamps, or both are available near the end of the period for food. If this is the case, one would expect liquid assets to also influence value of food consumed for participants. However, the number of observations may be too small to clearly isolate these effects.

Statistically, household size is the strongest variable influencing the value of food consumed. As household size increases from 6 to 7 persons, the monthly value of food consumed decreases by \$1.73 per adult equivalent. This relationship may reflect economies of size in food procurement and preparation not incorporated into the unit equivalent scales. (Reasons for these economies of size are discussed in West and Price).

Meat produced at home or obtained by hunting and fishing significantly increased the value of food consumed for participants and for the combined sample. For participants, this food was obtained without the expenditure of stamps and may have been viewed as a supplement or addition to other food purchases with stamps.⁹ Nonparticipants could substitute home produced meat for cash purchases of meat and use the cash for other purposes.

The level of physiological need had a significant direct effect on value of food con-

sumed in the combined sample and for food stamp participants. These results are consistent with theoretical expectations. A higher level of physiological need leads to increased values of food consumed. This finding indicates that one variable frequently attributed to taste factors, by economists, can be measured.

The profile data show that food stamp participants have a higher physiological need level than nonparticipants. The regression results show the value of food consumed to be higher for food stamp recipients than nonrecipients. Thus, the food stamp program is an indirect mechanism for satisfying these needs. Therefore, households with high physiological needs would be most highly motivated to participate in the program.

Ethnic group was included as a partial control for food habits. Mexican-American and Black households have different food patterns than Whites [Price]. The types of food served by these two ethnic groups were hypothesized to lead to a lower value of food consumed than Whites. However, none of the coefficients were statistically significant.

Nutrient Intake and Food Stamp Participation

The receipt of food stamps increases the value of food consumed, but analysis of whether or not this increase has nutritional benefit is less clear. Mean intakes of ten major nutrients calculated as a percent of the RDA (recommended daily allowance) for the children aged 8-12 years in the combined sample show little difference between food stamp participants and nonparticipants (Table 3). The sample estimates weighted ethnically for Washington's population show some differences but these are difficult to test for significance due to the stratification and complex sample design. Tests of differences for the White sub-group, which accounts for about 80 percent of the weighted sample, indicated that only the difference for riboflavin was significant at the 10 percent level or above.

Means were also calculated from two sub-

⁹Since a higher percentage of participants were from urban areas these results would appear to indicate that the coefficient for home produced meat is higher for urban than for rural households. The authors attribute the major cause of the difference to food stamp households viewing home produced meat as an addition to purchased food while nonparticipants view it as a substitute for purchased food. We assume no difference in the coefficient between urban and non urban households.

TABLE 3. Nutrient Intakes of 8-12 Year Old Children from Households Eligible for Food Stamps, State of Washington, 1972-73

	Sample Values		Sample Value Weighted by State's Proportion of Blacks and Mexican Americans		Sample Values	
	Food Stamp Participants N = 196	Eligible Nonparti- cipants N = 136	Food Stamp Partici- pants	Eligible Nonparti- cipants	Food Expenditures < \$44/Mo. N = 170	Food Expenditures > \$44/Mo. N = 162
	--- (% of RDA) ---					
Energy	77.4 (21.2)	78.5 (20.6)	79.2	78.7	77.2 (20.0)	78.5 (21.9)
Protein	171.4 (47.7)	173.3 (50.3)	179.5	175.1	170.8 (49.9)	173.3 (47.9)
Calcium	92.2 (40.1)	90.0 (36.3)	101.2	94.6	88.9 (37.7)	94.8 (36.9)
Phosphorus	122.8 (41.8)	122.9 (41.4)	131.5	125.5	120.2 (41.8)	125.6 (41.3)
Iron	94.8 (40.8)	94.5 (39.6)	100.1	95.1	92.4 (40.3)	97.1 (40.2)
Vitamin A	123.7 (80.0)	118.1 (80.9)	131.5	122.0	115.1 (78.6)	128.0 (81.8)
Thiamin	101.1 (56.7)	99.1 (63.6)	109.1	105.9	95.7 (46.6)	105.1 (70.5)
Riboflavin	151.0 (69.7)	144.7 (61.1)	167.3	150.4	143.1 (63.0)	153.3 (70.1)
Niacin	93.3 (40.0)	90.2 (37.3)	98.9	93.9	89.8 (37.0)	94.4 (40.9)
Vitamin C	170.7 (128.5)	175.3 (139.0)	177.6	176.2	170.6 (130.4)	174.7 (135.4)

NOTE: Standard deviations of variables are in parentheses.

sets of the sample classified by monthly value of food consumed per adult equivalent (Table 3). The means for all ten nutrients are larger for the subset with higher values of food. The differences are relatively small in magnitude, however, and none are statistically significant. It appears that the relationship of nutrient intake to value of food is also not strong.

The analysis of nutrient intake is subject to several qualifications. First, nutrient intake data were available only for the 8 to 12 year old children in the households. Among these children, over 70 percent of those in households participating in the FSP and 60 percent of those in nonparticipating households took the NSLP school lunch 4 to 5 times per week. Thus, most of the nutrient intake observations are on persons who used the school

lunch program. These lunches are required to provide a minimum of one-third of the RDA for the child. It is possible that other household members not getting the school lunch would have benefited more nutritionally from food stamps.

A second qualification is that other variables affecting nutrient intake such as education or school lunch participation are not held constant. Comparisons are made only by food stamp participation and value of food consumed. The food stamp program increases food purchasing ability. If food expenditures are not closely related to nutrient intake as the comparison of means suggests, then food stamp participation would also be expected to show little relationship with nutrient intake. Previous research [Price, et. al. 1978] with this sample has shown little relationship be-

tween nutrient intake and either value of food obtained or food stamp participation.

One other qualification concerns the income characteristics of the sample. The State of Washington has relatively high AFDC payments [Office of Program Planning's Data Book, 1972]. Monthly payments in April, 1972, averaged \$63.43 per recipient as compared to the national average of \$52.16. Nationally, payments ranged from \$14.73 (Mississippi) to \$77.20 (Hawaii) with three of the eleven Western states between \$20 and \$40. Food consumption is known to increase less rapidly with income or "flatten out" at higher income levels. The nutrient intake-food expenditure relationship may become flat at a lower income level because adequate nutrients can be obtained from relatively low-cost foods.

Implications

Participation in the food stamp program where the total value of stamps can be spent on only food items resulted in an increased value of food consumed for the household. This value for those getting food stamps was less sensitive to levels of liquid assets and current income than for nonparticipants. There was also less substitution of free school lunches and home-produced meat for regular food purchases among households using stamps. These findings are consistent in indicating that the food stamp program increases the demand for food. They also suggest that issuance of only bonus stamps after elimination of the purchase requirement may reduce food demand among continuing participants. This could occur because of more substitution for what will then be cash food purchases. Empirical verification is needed, however, since other factors may inhibit or retard such substitution.

The use of food stamps increased the value of food consumed by participants by 13 percent over that for nonparticipants. At the mean value of food consumed, this increase translates into a .31 propensity to consume out of bonus stamps. Thus, the value of food for participants is more than twice as respon-

sive to receipt of bonus stamps than value of food is to income among all eligible households where the income elasticity is .04. If food stamps were replaced by a cash subsidy and participants' behavior was similar to that of the eligible nonparticipants, one would expect their demand for food to decrease as a result of receiving the cash subsidy.

There is evidence to suggest that participants' behavior differs somewhat from that of nonparticipants. Indifference curve analysis indicates that if a participant spends money on food above his food stamp allotment, he would not decrease food expenditures as a result of having fewer stamps [Mittelhammer and West]. Participant households in this study spent an average of \$29 per month (Table 1) in addition to stamps for food. Assuming this additional amount was normally distributed, about five-sixths of the households spent some additional cash on food. If this behavior is representative, then there would be a small decrease in food demand among households not spending anything for food in addition to stamps.

If food stamp recipients are rational and if they are buying food in addition to stamps, and if nonrecipients are rational and consume a smaller value of food than recipients, the nonrecipients must, due to taste factors, prefer less food than recipients. If this were so, changing to the new provisions of the program, or going to a strictly cash basis would not reduce the demand for food.

An alternative explanation is that the additional amount spent for food by food stamp recipients is due to the household's inability to manage money over the pay period with the resultant lack of money to provide sufficient food. This variable has been shown to be significant in this model. If food stamp recipients use up the stamps before the end of the month (almost all recipients in this survey purchased stamps monthly), they would pay cash for food for the remaining time period. This survey did not include questions as to why recipients paid cash in addition to stamps. However, conversations with interviewers in the local areas did reveal

that some households used up food stamps prior to the end of the month.

If this latter scenario is actuality and no difference in preference for food exists, other than the motivational difference reflected by physiological need level, the new provisions of the food stamp program will lead to a decreased demand for food. The receipt of cash in place of food stamps would decrease the demand for food by an even greater amount.

The results of this study show little nutritional benefit to the 8-12 year old child in the household that is directly attributable to food stamps. Qualifications such as not controlling for effects of the hot school lunch are present and more empirical work involving all members of the household is needed. Other aspects of the food stamp program such as increasing the demand for plentiful foods and increasing donor utility by specifying transfers in the form of food are viewed as benefits by some segments of society.

The above implications and conclusions are strictly valid for only populations with the same relevant characteristics as the sample. The sample was of households with 8-12 year old children in the State of Washington. Two important characteristics of this sample should be kept in mind when assessing the results. First, the relatively high AFDC payments in the state provides a relatively high floor under income. Second, since a household must include an 8-12 year old child and the child was the sampling unit, household size is much larger than the average for all households in the state.

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Appendix A: Instrument Used to Measure Need Levels

The instrument consisted of 30 cards with each containing one of the statements listed below. The respondent was given the 30 cards with a "game" board which contained 5 pockets for the five categories described below. The interviewer assisted the respondent when necessary.

Interviewer Instructions

Here are 30 cards. Each has an opinion about home or family. There are no right or wrong opinions, and you may even find that you agree with most of them, or disagree with most of them. However, I'd like you to try to sort them out according to those that are more like you and those that are less like you. Put them into 5 piles:

- 3 cards most like you
- 6 cards next most like you
- 3 cards least like you
- 6 cards next least like you
- 12 cards that might be like you sometimes, but not like you otherwise

(If there is a problem in sorting cards at first, interviewer might suggest sorting first into three piles — most like me, least like me, and others. After this is done, some discussion might help in sorting into the final five piles.)

List of Statements Included on the 30 cards

A. Physiological Needs

1. I'd like a good income, a nice home, and a nice car.
2. It's important to take time out regularly to eat and rest.
3. A house full of modern conveniences would make me happy.
4. I like to work where conditions are

good, such as good lighting and enough storage.

5. I prefer working when there is no pressure on me.
6. Enough money to satisfy basic needs would make me happy.

B. Security Needs

7. I'd like to be sure that I have enough money in case an emergency comes.
8. Family and friends should judge me by how well I do my work.
9. I'd like to live near my relatives and friends.
10. I like to work with familiar equipment.
11. If something goes wrong at home, it bothers me to be blamed for it.
12. Marriage and family life is good because it gives a feeling of security.

C. Love and Belonging Needs

13. I like to work with other people.
14. I'm happiest when others aren't mad at me.
15. The best thing about a family is always having people around.
16. Family life is worthwhile when we all share good times.
17. All members of the family should get along well together.
18. The children in a family should feel loved.

D. Self Esteem Needs

19. I want to get ahead in whatever I do.
20. I enjoy having the family compliment me for doing something well.
21. The family should pay attention to special things I do for them.
22. I enjoy getting surprise gifts.
23. The every day work I do for my family deserves their respect.
24. I prefer doing big, important jobs rather than routine, simple jobs.

E. Self Realization Needs

25. The challenge of work itself gives me

satisfaction.

26. I want to use my best skills in whatever I do.
27. I enjoy doing new things.
28. I like to do things that take a lot of thought or skill.
29. I do my best when I'm working on something I find personally interesting.
30. I enjoy doing something when I'm free to choose what it is and when and how to do it.