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Overview

Can Food Stamps Do More To Improve Food Choices?

Joanne F. Guthrie, Biing-Hwan Lin, Michele Ver Ploeg, Elizabeth Frazao

Economic Information Bulletin Number 29-1

September 2007

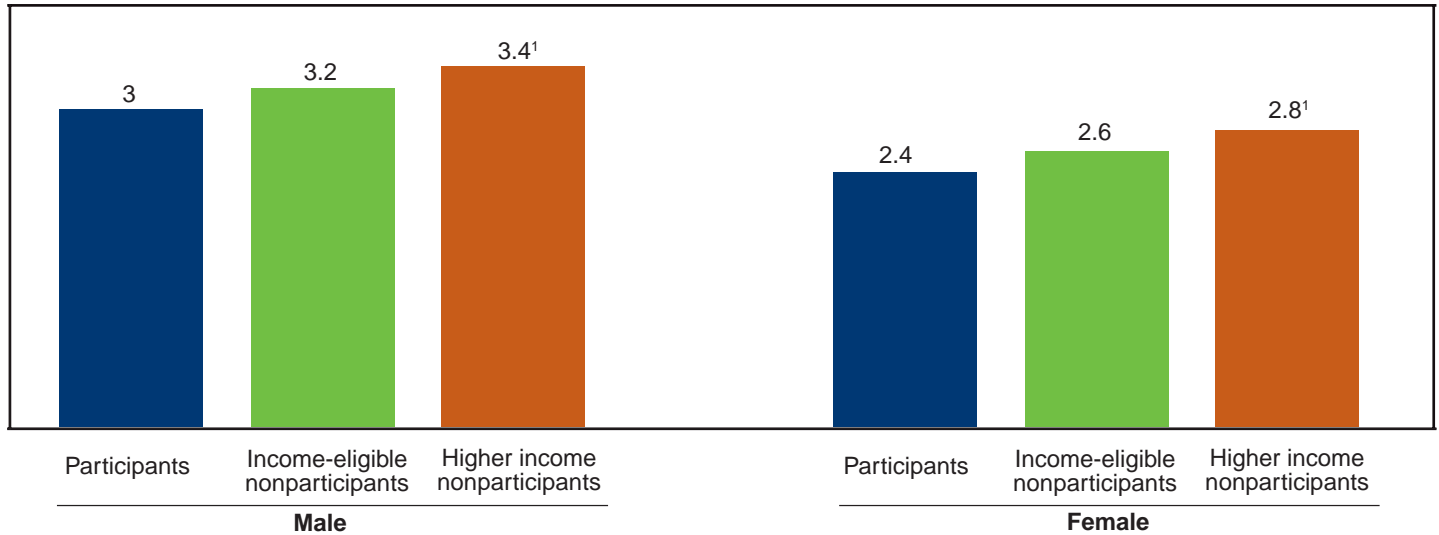
The Food Stamp Program began with the goal of assuring that no American would be without enough to eat. Serving more than 26 million Americans in 2006, the program continues to be an important part of the Federal safety net. The increased food purchasing power offered by the Food Stamp Program has been found to promote food security and improve the overall economic well-being of low-income households (LeBlanc et al., 2006). However, its effect on the quality of the diets of food stamp recipients is less clear.



Figure 1

Average daily vegetable consumption of Food Stamp Program participants and nonparticipants ages 9 and older

Number of servings



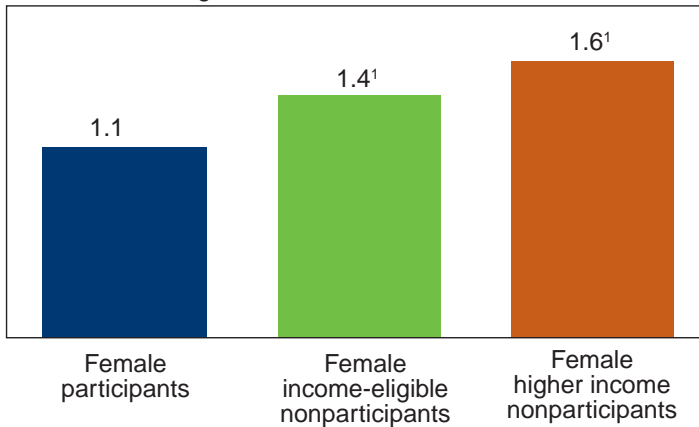
¹Statistically different from consumption patterns of food stamp participants.

Source: 1988-94 National Health and Nutrition Examination Survey (NHANES III) data, as reported in Fox and Cole, 2004.

Figure 2

Average daily fruit consumption of female Food Stamp Program participants and nonparticipants

Number of servings



¹Statistically different from consumption patterns of food stamp participants.

Source: 1988-94 National Health and Nutrition Examination Survey (NHANES III) data, as reported in Fox and Cole, 2004.

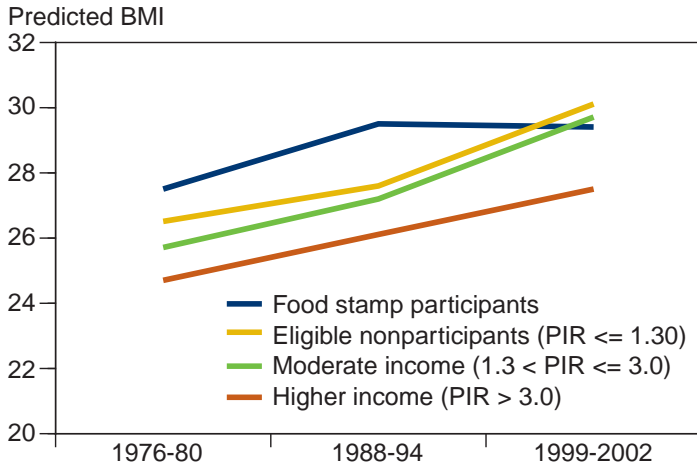
Consumption data show that the diets of food stamp participants do not follow the pattern recommended by the 2005 Dietary Guidelines for Americans and USDA's MyPyramid. Intakes are higher than recommended in saturated fat and sodium and lower than recommended in servings of milk, fruits, and vegetables (Fox and Cole, 2004). Among the most notable problems are underconsumption of fruits and

vegetables. This problem is not unique to food stamp participants; most Americans fail to meet recommendations for these foods. For example, vegetable consumption of food stamp participants is lower than that of higher income nonparticipants but is not statistically different from those of nonparticipants with incomes low enough to qualify for food stamps (income-eligible nonparticipants) (fig. 1). Fruit consumption of female food stamp participants is lower than that of both income-eligible and higher income nonparticipants (fig. 2). These simple, cross-sectional comparisons cannot be used to assess the effect of Food Stamp Program participation on fruit and vegetable intakes; groups may differ on several other factors that may contribute to the differences found. However, it is clear that not consuming enough fruits and vegetables is a major dietary problem for Americans, especially for those who receive food stamps.

Similarly, food stamp participants are not alone in suffering from the growing prevalence of obesity. In fact, recent national data on the weight status of Americans indicate that differences in the weight status of food stamp participants and nonparticipants have diminished. Unfortunately, this reduction is because nonparticipants have become more likely to be overweight and obese not because food stamp participants have become less likely to be overweight and obese. Among non-Hispanic White women, the group for which the change in trends is most dramatic, food stamp participation was strongly associated with overweight 20

Figure 3

Among non-Hispanic White women, the BMI of food stamp recipients has remained steady but has increased for nonrecipients



Predicted BMI (Body Mass Index) calculated using regression coefficients assuming age 40. PIR is the ratio of income to the Federal poverty threshold.

Source: Economic Research Service/USDA, using data from National Health and Nutrition Examination Surveys.

years ago, but more recent national data show that, since then, the prevalence of overweight has grown most among nonparticipating women (fig. 3). Trends are less dramatic for African-American and Hispanic women, but overall, the data show a similar pattern.

Trends for men are almost the exact opposite of those for women. Data from previous years showed that male food stamp recipients were less likely to be overweight than eligible male nonparticipants and higher income men. However, the most recent data show that differences in overweight status have almost entirely disappeared. Thus, over the past decades, the weight status of male food stamp participants has become more like that of other American men (Ver Ploeg et al., 2006).

These findings indicate that food stamp participants are not much different from other Americans in needing to eat more fruits and vegetables and to improve their weight status. Although the findings may not support contentions that the program is a major reason for the problems, neither do they undercut arguments that the Food Stamp Program should do more to improve food choices of participants. Poor diets, obesity, and associated health problems exert heavy costs to society in increased medical expenditures and lost productivity. If program changes were successful in promoting healthful food choices among the 26 million low-income Americans participating in the Food Stamp Program, these changes could yield considerable benefits in reduced medical costs and increased productivity.

This folder compiles evidence to help answer the question of whether the Food Stamp Program can do more to improve the food choices of benefit recipients. It examines the evidence that affordability and price of healthful foods affect food choices and the role of education in improving food choices. Innovative approaches to improving food choices drawn from behavioral economics are considered. Finally, measuring the effects of any policy change on food choices and health outcomes continues to be a challenge; ERS activities to meet the challenge through improved data, measures, and analytical methods are discussed.

Are Healthy Diets Affordable for All Food Stamp Participants?

Some nutrition advocates argue that food stamp benefits are not sufficient to purchase all the foods recommended for a healthful diet, including a variety of fruits and vegetables. Maximum food stamp benefits are set and updated annually based on the Thrifty Food Plan, a market basket of foods that can guide recipients in purchasing a diet that meets Federal dietary guidelines, including the recommended servings of fruits and vegetables, at minimal cost. Households with income are expected to spend some of their own cash resources on food (30 percent of income adjusted for allowable deductions). Therefore, households receive benefit amounts that augment cash resources to bring them up to the Thrifty Food Plan level. In 2004, for example, the maximum benefit level for a family of four was \$471, with an average benefit level of \$326. So, on average, participating four-person households were expected to contribute \$145 of their own income to food spending. Participants are not required to buy the mix of foods in this market basket; they are free to buy almost all foods sold in grocery stores, with a few exceptions, such as hot, prepared foods.

Program benefits are based on average national food prices, but prices vary in different areas of the United States. If food prices differ greatly from area to area, food stamp benefits will have a lower purchasing power in higher priced areas compared with lower priced areas, possibly making it more difficult for some participants to afford a healthful diet. Using data on food prices paid by a national sample of consumers, **Leibtag**¹ found considerable differences in food prices for a broad mix of foods. In 1998-2003, average prices in the East and West ranged from 8 percent to 11 percent above the national average, whereas average prices in the South and Midwest ranged from 7 percent to 5 percent below the national average. Leibtag also found that

¹Bolded names indicate author(s) of relevant bulletins in this folder. See box at end of this overview for full citations.

prices paid for foods can be influenced by consumer behavior and that low-income consumers typically economized with such strategies as buying private-label (store brand) products, items on sale, and less expensive fruits and vegetables. Nevertheless, regional differences in prices could be a challenge to the affordability of a healthful diet for some food stamp households.

Using data from a national sample of households, **Nord and Hopwood** found that the amount of money that low- and medium-income households believe necessary to “just meet their food needs” (“enough food”) can vary considerably across different geographic areas of the country. Although the cost of “enough food” is affected by many factors, such as social norms and nutrition knowledge of what constitutes an adequate diet, the association of perceived cost of “enough food” with the area within which a household lives suggests that local food prices also play a role. About 17 percent of food stamp participants live in areas where the “cost of enough food” is 10 percent above the national average or higher.

Increasing Food Purchasing Power May Not Change Spending on Fruits and Vegetables

Some program critics believe that the problem of affordability is general enough that the best way to improve food choices would be to increase food purchasing power by raising food stamp benefits. Increasing benefits would essentially provide households with greater income, hopefully resulting in more purchases of fruits and vegetables.

Frazao and colleagues assess the likely effects of an unrestricted increase in food purchasing power, such as an increase in food stamp benefits, by examining food expenditures of households at various income levels. They find that, as annual household income increases, spending on

As annual household income increases, spending on fruits and vegetables changes little until income reaches about \$70,000.

fruits and vegetables changes little until income reaches about \$70,000. Besides nutrition, households have competing wants and needs; with small increases in income, other wants and needs take priority over purchases of fruits and vegetables. Only a large increase in household income seems to have much effect on fruit and vegetable purchases.

Changing the Relative Price of Healthy Foods—A Potential Policy Strategy

The findings of Frazao and colleagues indicate that a general increase in food stamp benefits would not have much effect on fruit and vegetable expenditures. A proposed alternative strategy is to encourage fruit and vegetable purchases more directly via bonuses or coupons when fruits and vegetables are purchased with food stamps. This approach would lower the price of these foods for food stamp participants, potentially making fruits and vegetables more appealing.

Lin and Guthrie examined the likely effects of such an approach, using ERS-generated information on the response of low-income consumers to changes in food prices and two case studies of consumer response to food prices. Although consumer response to prices may be weak for some foods, the response to prices for fruits and vegetables is stronger, and price manipulation via bonuses or coupons for food stamp participants who purchase fruits and vegetables may increase purchases of these foods.

Whether the effect would be powerful enough to result in food stamp participants consuming a diet that met Federal recommendations for fruits and vegetables is another question. The response to price depends on the size of the manipulation. Lin and Guthrie estimated that a 20-percent price reduction would raise fruit and vegetable consumption to 2.2 cups per day—an improvement but still below recommendations for typical adults. Nutrition education and promotion activities may enhance the effectiveness of price manipulation strategies. Stronger price manipulations, such as providing food stamp households with vouchers for fruit and vegetable purchases, essentially reducing the price to zero, could also be tested.

Guthrie and colleagues examine two proposed strategies for improving food choices of food stamp participants that are currently the subject of much debate (this article previously appeared in the ERS magazine *Amber Waves*). The first strategy would restrict purchase of “unhealthful” foods with food stamp benefits; the second would expand benefits by offering bonuses or vouchers for purchase of healthful, underconsumed foods, such as fruits and vegetables. The analysis suggests that bonuses or vouchers may be a more successful strategy; coupling this approach with market innovation, retail promotion, and nutrition education may increase its effectiveness.

Changing Knowledge and Attitudes May Help

In addition to being influenced by income and price, food purchasing choices can be influenced by nutrition knowledge and attitudes. USDA uses nutrition education as its primary strategy to improve the food choices of food stamp

Resisting a sweet treat today because of good health tomorrow—or 20 years from now—can be difficult.

participants, with annual Federal expenditures for Food Stamp Nutrition Education reaching almost \$250 million in 2006. **Guthrie and Variyam** examine the challenges faced by Food Stamp Nutrition Education.

Nutrition information can prompt consumers to change their food choices—a well-known example is the shift from whole milk to reduced- and low-fat milk. Consumer response to information, however, can be inconsistent because consumers have other preferences, such as taste, convenience, etc., that compete with nutrition preferences. Also, good nutrition is a longrun benefit, whereas other preferences may be satisfied more immediately, making it hard, even for individuals who value nutrition, to consistently resist immediate gratification. Resisting a sweet treat today because of good health tomorrow—or 20 years from now—can be difficult.

Finally, developing and implementing effective public education programs, such as Food Stamp Nutrition Education, is not easy. The Food Stamp Program serves millions of people of all ages and backgrounds. Federal and State funding levels for fiscal 2006 translated into less than \$20 per food stamp participant in available funds for education programs. Cost-effective strategies for reaching and teaching such diverse audiences are a challenge, as are cost-effective strategies for evaluating educational outcomes. Improving data on nutrition education program outcomes could provide information on the programs' effectiveness and potentially guide development of improved educational approaches.

Behavioral Economics Research Suggests New Approaches

New ideas for improving food choices of food stamp participants may come from the field of behavioral economics. Traditional economic thinking assumes that consumers, once they become knowledgeable about diet and health, will act rationally in choosing foods that will lead to long-term well-being. Behavioral economics, in contrast, emphasizes the reasons individuals regularly and predictably act in ways that seem to contradict typical notions of rationality. It suggests new explanations of why individuals may choose behaviors contrary to their long-term interest and has generated new ideas about how policies and environments might

be modified to help individuals act in their long-term best interests (Just et al., 2007). **Mancino and Andrews** examine findings from behavioral economics that suggest strategies that might be useful in improving the food choices and diet quality of food stamp participants.

Improved Evaluation Data and Methods Are Needed To Assess Effects of Policy Changes

This folder compiles information that policymakers, program officials, and health advocates can use in considering potential approaches to improving the food choices of food stamp participants. However, without adequate evaluation, policymakers will never know whether any changes that are adopted turn out to be effective, ineffective, or even counterproductive. Unfortunately, measuring the effect of the Food Stamp Program on food choices and health outcomes is a difficult endeavor. An ERS review of research on Food Stamp Program outcomes found broad consensus that the program increases food spending and household income, but its effects on the nutritional quality of participants' diets is uncertain (LeBlanc et al., 2006).

That there would be uncertainty and debate on this topic may seem surprising, given that national food consumption survey data on food stamp participants and nonparticipants have been collected for decades. The basic problem is that a simple comparison of diets of participants and nonparticipants does not address the bias introduced by "self-selection" of program participants. The Food Stamp Program is an entitlement program, but eligible households choose

Behavioral economics....has generated new ideas about how policies and environments might be modified to help individuals act in their long-term best interests.

whether or not to participate—and only 60 percent do, based on the most recent available estimates. Those who choose to participate may be different from those who choose not to participate, and these differences could also be related to their food choices. While demographic and other characteristics can be used by researchers to help control for differences between participants and nonparticipants, it's impossible to be sure that such factors fully capture all differences relevant to food choice. If researchers do not account for "self-selection bias," simple comparisons

of diets of food stamp participants and nonparticipants will not provide an accurate answer to the question of how the program affects food choice. Although a variety of sophisticated statistical procedures to counteract selection bias have been developed, none of these techniques can guarantee that selection bias has been eliminated.

Frazao and colleagues review the priority needs for improved evaluation of nutrition outcomes of the Food Stamp Program and summarize activities that the Economic Research Service (ERS) is currently undertaking in support of improved evaluation. The ERS Consumer Data Initiative is designed to provide decisionmakers with more timely, accurate, and comprehensive data. It should result in expanded data on consumer food purchases and prices paid, consumers' nutrition knowledge and relevant behaviors (such as use of nutrition labeling), and, through linkage with program participation, enhanced ability to examine participation-related outcomes. Although expanded data per se will not solve the problem of selection bias, they will provide improved understanding of the relationship of important economic and policy factors to program participation and outcomes and could expand analytical options for addressing selection bias in analyses.

ERS is also working to improve measurement of nutrition outcomes. Early evaluations of the Food Stamp Program typically compared average consumption of foods and nutrients by participants and nonparticipants, implicitly assuming that "more is always better." Modern nutritional thinking stresses moderation and balance, with new Dietary Reference Intakes (DRIs) better designed to identify both adequate and excessive nutrient intakes. ERS has supported research to improve these outcome measures and to develop methodologies to apply them to food assistance program evaluation. Finally, ERS, in collaboration with USDA's Food and Nutrition Service (FNS), is working to develop a cost-effective method for assessing outcomes of Food Stamp Nutrition Education.

Conclusions

The increase in food purchasing power provided by the Food Stamp Program has helped low-income Americans solve the basic problem of getting enough to eat. Can changes in Food Stamp Program policies do more to help participants solve the nutrition problems of today, which are associated with choice of food, as well as amount? Specifically, can policy changes encourage food stamp participants to purchase and consume recommended amounts of fruits and vegetables? Changing participants' behavior will not be an easy task. The most recent data indicate that, despite 15 years of vigorous promotion through the public/private "5-

A-Day" initiative (recently renamed the "More Matters" initiative), Americans, as a whole, have not improved their consumption of fruits and vegetables (Casagrande et al., 2007). Clearly, low income is not the only barrier to consumption that must be addressed.

Nevertheless, the Food Stamp Program, with its influence on the food consumption of almost 1 in 12 Americans, offers an important opportunity for promoting healthful food choices. The success of proposed policy changes rests on their effectiveness in creating the intended changes in consumer behavior. The ERS research summarized in this folder can guide policymakers, program officials, and health and poverty advocates in assessing the likely effects of proposed policies. Ongoing ERS research and evaluation activities can also provide decisionmakers with feedback on the outcomes of policy changes.

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Can Food Stamps Do More To Improve Food Choices? An Economic Perspective

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Stretching the Food Stamp Dollar

Regional Price Differences Affect Affordability of Food

Ephraim S. Leibtag

Economic Information Bulletin Number 29-2

September 2007

The Food Stamp Program provides low-income households with supplementary income for food purchases in amounts judged sufficient to purchase healthful, adequate diets. Except those for residents of Alaska and Hawaii, benefits are based on national average prices. Significant regional differences in food prices, however, could affect how far a food stamp benefit goes in enhancing the diet of low-income consumers in a given region. For example, if food prices were significantly higher in one region than in other regions, households may choose to purchase less of some healthful foods, such as fruits and vegetables, with their limited food budget. In regions where average food prices exceed the national average, food stamp benefits may not provide the same level of coverage as the same benefit would in below-average-price regions. This variation may force low-income households to economize in their food purchase behavior when faced with higher than average food prices.

ERS looked at prices paid across the four major U.S. regions and found that prices are lowest in the Midwest and South for most food products and highest in the East and West (Leibtag, 2006) (see box). For example, during 1998-2003, average prices for a representative mix of products, including meat, grain, and fruit and vegetable categories, were 8.0 and 11.1 percent above the national average in the East and West but 7.0 and 5.2 percent below the national average in the South and Midwest (fig. 1). These differences imply that a household made up of a family of four in the East or West would spend \$32-\$48 more per month on food than the average U.S. household, whereas a household in the South and Midwest would spend \$12-\$28 less per month for a similar amount of food than the average U.S. household.

Price differences across regions are especially noteworthy given the relatively stable level of food price inflation from 1998 to 2003. The highest average annual inflation rate was in the East (1.78 percent), while the annual average rate for the West, South, and Midwest was 1.77, 1.52,



and 0.84 percent, respectively. This implies that simply adjusting food stamp benefits for inflation by region over time would not completely account for price variation since the cross-market variation at any point in time is two to eight times as large as the price change over time. To gain additional insight into these differences, ERS researchers compared average prices across major U.S. markets and store types to better illuminate possible causes of the observed regional price variation.¹

¹ERS studied eight large metropolitan areas: Atlanta, Baltimore-Washington, Chicago, Los Angeles, New York, Philadelphia, San Antonio, and San Francisco.

For the most part, market differences follow the general regional patterns just discussed. Chicago (Midwest) had the lowest average market prices, while Los Angeles and San Francisco (West) had the highest. The only exception to the regional patterns was in Philadelphia where prices were second lowest, on average, and not statistically different from average prices in Chicago and Atlanta.

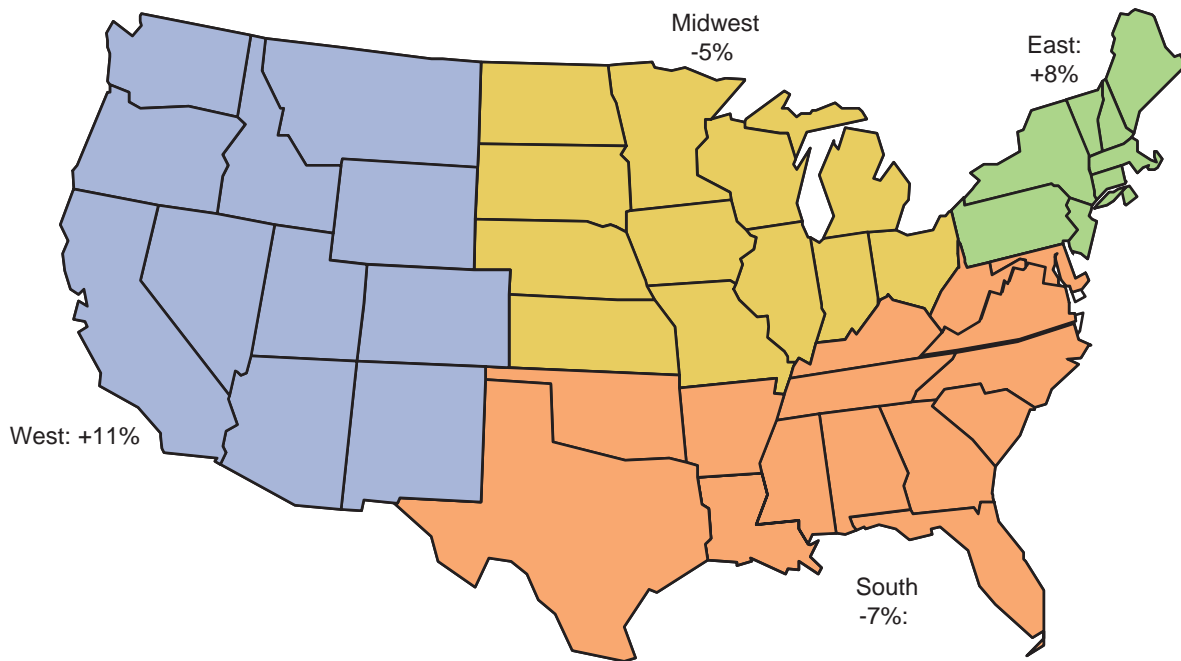
These statistically significant differences in prices across U.S. markets indicate differences in both food costs and consumers' purchasing behavior. Price variation at the retail level is a function of both supply and demand conditions in a given market. On the supply side, differences in transaction, marketing, or operating costs may explain some of the retail price variation. On the demand side, consumer preferences for different retail store formats generate differences in average prices across markets, depending on the level of retail competition in a given market.

Consumers can affect the prices they pay for foods through their purchasing behavior, which can include using coupons, purchasing larger packages, checking the newspaper for sale items, or traveling to a store that offers lower prices. ERS research, in fact, found that low-income consumers are able to economize by purchasing some food

products on sale, private-label (store brand) products, and less expensive meats, fruits, and vegetables (Leibtag and Kaufman, 2003). Nevertheless, ERS research finds that differences in food prices paid are not as pronounced across demographic groups as they are across geographic areas. For example, Leibtag (2006) finds that average dairy prices differ by 1.1-5.3 percent across income groups. Because regional and market differences are larger than differences in prices paid by income groups, geographic differences are the result of more than just differences in the income distribution of a region or market. The retail food stores available to consumers in a given market affect average prices paid for food because stores use price differences as one way to differentiate themselves from competitors.

Given that the difference in prices paid is smaller across income groups than across regions and markets, a store's format—including physical characteristics, product offerings, business practices, and marketing strategies—is a likely determinant of variation in retail food prices. One of the biggest changes in the retail food market landscape over the past 10 years has been the growth of nontraditional food outlets. Such firms as Wal-Mart, Costco, and Target sell both food and nonfood products in several store formats. Recent ERS research (Leibtag, 2006) focused on the differ-

Figure 1
Regional food prices differ from the national average



Source: Economic Research Service/USDA, using Bureau of Labor Statistics' average price data and Nielsen Homescan Data, 1998-2003.

How Are Average Regional and Market Prices Calculated?

This research uses Nielsen Homescan scanner panel data for 1998-2003. The annual data are from a consumer panel of about 8,500 representative households across the United States and include purchasing and demographic information. Panelists recorded both prices paid and quantities purchased for Universal Product Coded (UPC) and random-weight (non-UPC) food purchases over the year(s) that the panelists participated in the survey.

Average prices were calculated for a wide variety of products commonly purchased for food-at-home consumption. The average prices were calculated by dividing the total weighted expenditures for a given product by the total weighted quantity that was purchased. These average prices were then weighted using projection factors for each household in the sample to arrive at a national average in each food category. The same method was used for individual U.S. markets and regions in order to be able to make valid comparisons.

ence in food prices across store format types as the changing retail food market landscape has impacted where people shop for food as well as what prices they pay.

Food product comparisons were made for similar package sizes and a representative sample of specifically defined food products. Results showed that dairy prices are 5-25 percent lower at nontraditional retailers than at traditional supermarkets. These price differences are statistically significant when modeled in an analysis of variance, and the

differences between store formats is significant even after controlling for region, household income, and inflation over time. Since the number of nontraditional retailers and their relative market share varies by market and region, food price dispersion will increase as long as these differences in market share persist.

Accounting for regional differences in food prices is an important issue for the Food Stamp Program as it strives to ensure the affordability of healthful diets for all Americans. However, the extent to which regional benefit level adjustments would improve the program's ability to promote healthful diets has not yet been determined since consumer tastes and preferences also play a significant role in food choices. Even if benefit levels were adjusted to match food prices in a given region or market, households may still continue to purchase less healthful products due to competing preferences for convenience or taste. In addition, the administrative costs of regional adjustment that such a change could create have not been estimated.

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Higher Cost of Food in Some Areas May Affect Food Stamp Households' Ability To Make Healthy Food Choices

Mark Nord, Heather Hopwood

Economic Information Bulletin Number 29-3

September 2007

The Food Stamp Program augments food resources of low-income households, with the goal of ensuring that they can afford healthy, nutritious diets. The maximum benefit for each household size is based on the cost, at national average prices, of the Thrifty Food Plan (TFP)—a set of meal plans that provides a nutritious diet at a minimal cost. The food stamp benefit formula does not account for geographic differences in food prices (except in Alaska and Hawaii, where food prices and benefits are higher). In other areas, if food prices are substantially higher than the national average, food stamp benefits may be insufficient to provide a healthy, varied diet consistent with a normal range of food preferences.

This report examines the extent of geographic variability in food costs, using nationally representative data on the amount that households report they would need to spend to just meet their food needs. Differences across metropolitan areas and State-level nonmetropolitan areas in the reported cost of “enough food” are examined, giving special attention to the proportion of Food Stamp Program participants living in areas where the cost of enough food is substantially higher than the national average.

What Is the Cost of “Enough Food”?

The cost of “enough food” in an area is the average amount that low- and medium-income households in that area report needing to spend to just meet their food needs, adjusted for household size and income (see box).

The cost of enough food in an area depends both on local food prices and on social perceptions of what an adequate diet comprises. Nord and Leibtag compared the cost-of-enough-food measure with food price indices across 171 cities for which comparable food price data were available. The associations they observed between the cost-of-enough-food measure and food price indices suggested that differences in the cost-of-enough-food measure used in this study reflect primarily, but not exclusively, differences in food prices.



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Food Stamp Program Maximum Benefit Level Slightly Lower Than Average Cost of Enough Food

The amount that households usually spend for food increases steadily as incomes rise from low levels to seven times the poverty line (fig. 1). The minimum amount households report that they would need to spend to just meet their food needs is more weakly related to income and is nearly constant at around 30-33 percent of the poverty line for households with annual incomes up to twice the poverty line—a range that includes almost all food stamp recipients. The maximum Food Stamp Program allotment is, on average, about 28 percent of the poverty line, and about 10 percent less than the national average cost of enough food reported by low-income households.

How Is the Cost of “Enough Food” Calculated?

The cost of “enough food” is calculated from the amount that households report they would need to spend to just meet their food needs. Households interviewed in the Current Population Survey Food Security Supplement (CPS-FSS) are first asked several questions to establish how much they usually spend for food each week. They are then asked, “In order to buy just enough food to meet the needs of your household, would you need to spend more than you do now or could you spend less?” If they say “more,” they are then asked how much more. If they say “less,” they are asked how much less.

The minimum weekly food spending needed for each household is annualized and divided by the household’s annual poverty

threshold to adjust for household size and composition. The cost of enough food for each metropolitan area and for each State’s nonmetropolitan area is calculated as the average cost of enough food reported by households with incomes of less than five times the poverty line living in that area. An adjustment is made for each household’s income since households with higher income generally report slightly higher minimum food spending needed.

The CPS-FSS is a nationally representative survey conducted by the Census Bureau for USDA. The statistics reported here are based on responses of 109,216 households with incomes below five times the poverty line interviewed in four surveys between September 2000 and December 2002.

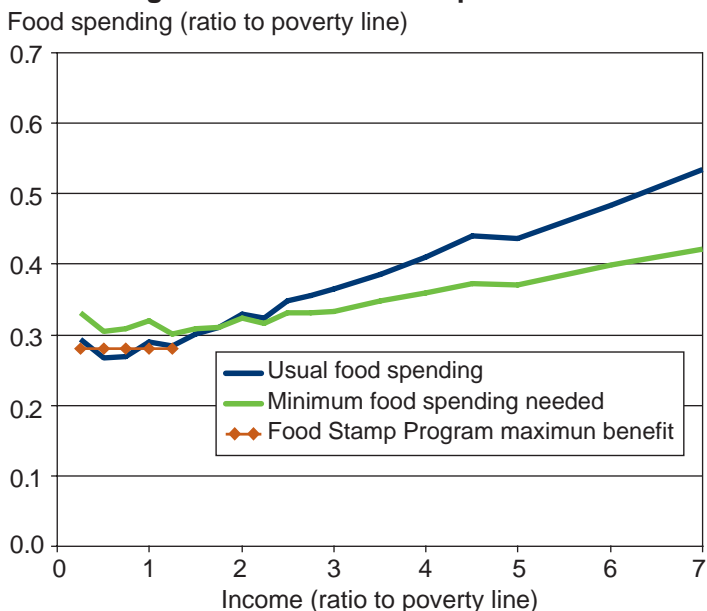
Cost of Enough Food Is Substantially Higher in Some Areas

About 17 percent of households that received food stamps during 2000-02 (excluding those in Alaska and Hawaii) were in locales where the cost of enough food exceeded the national average by 10 percent or more (fig. 2). For this analysis, a household’s locale was defined as the entire Metropolitan Statistical Area (MSA) in which it was located, or, in the case of households in nonmetropolitan areas, the entire nonmetropolitan area of the State. The cost of enough food was 10 percent above the national average or higher in 25 MSAs and in the nonmetropolitan area of

Florida (table 1). In the highest cost MSAs—New York City, Newark, Fort Lauderdale, and San Francisco—the cost of enough food ranged from 18 to 28 percent above the national average.

Nationally, the cost of enough food was 11 percent lower in nonmetropolitan areas than in metropolitan areas. It is likely, however, that food costs are substantially higher in some rural areas—especially areas that are remote from urban centers, have low population density, and are poorly served by the transportation infrastructure. The data used in this study do not reflect these differences within nonmetropolitan areas below the State level.

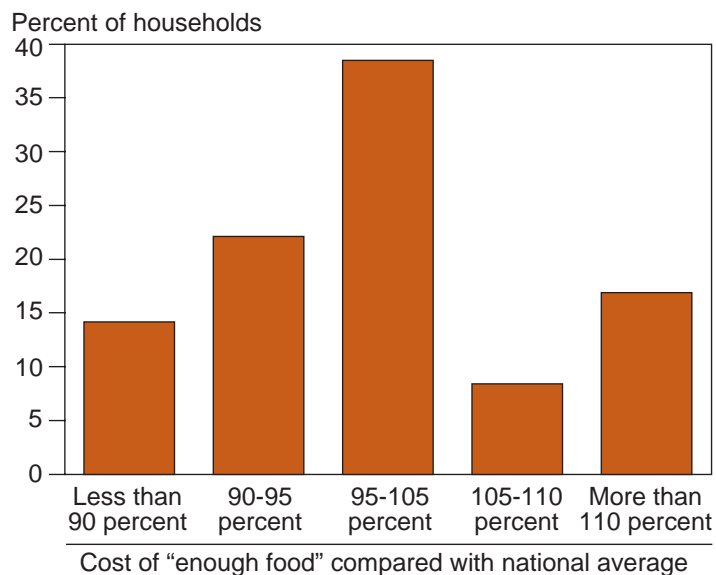
Figure 1
Average reported usual food spending and minimum food spending needed by income level compared with average maximum food stamp benefit



Source: Economic Research Service/USDA, using Current Population Survey Food Security Supplement data, 2000-02.

Note: Households in Alaska and Hawaii, where maximum food stamp benefits are higher than in other States, were omitted.

Figure 2
Distribution of food-stamp-eligible households by cost of “enough food” in their locale¹



¹The cost of “enough food” was averaged with each metropolitan statistical area and within the nonmetropolitan area of each State. Households in Alaska and Hawaii are not included.

Source: Economic Research Service/USDA, using Current Population Survey Food Security Supplement data, 2000-02.

Table 1
Locales with cost of “enough food” 10 percent above the national average or higher ¹

Area	Cost of “enough food” <i>Percent of national average</i>
San Francisco, CA	128
Fort Lauderdale, FL	122
Newark, NJ	119
New York, NY	118
Stamford-Norwalk, CT	117
San Jose, CA	113
West Palm Beach-Boca Raton, FL	113
Myrtle Beach, SC	113
Baton Rouge, LA	113
Boulder-Longmont, CO	113
Springfield, MA	112
Los Angeles-Long Beach, CA	112
Riverside-San Bernardino, CA	112
Orange County, CA	111
Miami, FL	111
Fort Myers-Cape Coral, CA	111
Florida nonmetropolitan areas	110

¹The cost of “enough food” in the following metropolitan statistical areas was also estimated to be higher than 110 percent of the national average, but specific estimates are not reported because they were based on reports of fewer than 100 households: Fort Pierce-Port St. Lucie, FL; Houma, LA; Jackson, MI; Lawrence, MA-NH; Montgomery, AL; San Luis Obispo-Atascadero-Paso Robles, CA; Santa Barbara-Santa Maria-Lompoc, CA; Santa Rosa, CA; Vallejo-Fairfield-Napa, CA.

Source: Economic Research Service/USDA, using Current Population Survey Food Security Supplement data, 2000-02.

The cost of enough food was at or above the national average in all of the nine most populous MSAs—those with populations exceeding 4 million (table 2). However, in all but two, the cost of enough food was within 5 percent of the national average.

In large metropolitan areas, the cost of enough food was generally higher in the incorporated areas of the main cities than in the surrounding suburban and exurban areas (table 3). Those differences were substantial in New York City and Los Angeles.

Setting the Food Stamp Program Benefit Level Balances Benefit Adequacy and Targeting

Both benefit adequacy and targeting efficiency could be improved if benefits could be adjusted for differences in local food costs. To be practically feasible, however, such an adjustment would need to be based on food cost data that are widely perceived to be highly accurate and reliable. The cost-of-enough-food statistics described in this report, based on subjective self-reports, are not likely to meet that standard, and official area-specific price data with national

Table 2
Cost of “enough food” in metropolitan areas with populations greater than 4 million

Metropolitan Statistical Area	Cost of “enough food” <i>Percent of national average</i>
New York, NY	118
Los Angeles-Long Beach, CA	111
Philadelphia, PA-NJ	105
Washington, DC-MD-VA	105
Chicago, IL	105
Houston, TX	103
Atlanta, GA	103
Dallas, TX	102
Detroit, MI	100

Source: Economic Research Service/USDA, using Current Population Survey Food Security Supplement data, 2000-02.

Table 3
Cost of “enough food” in central cities and surrounding areas of New York, Los Angeles, and Chicago¹

Metropolitan Statistical Area	Cost of “enough food” <i>Percent of national average</i>
New York, NY	
Central city	120
Surrounding suburban and exurban area	109
Los Angeles-Long Beach, CA	
Central city	116
Surrounding suburban and exurban area	108
Chicago, IL	
Central city	106
Surrounding suburban and exurban area	104

¹“Central city” generally includes the entire incorporated area of the main cities in the metropolitan statistical area. “Surrounding suburban and exurban area” includes adjacent densely populated counties that are closely linked to the central city by commuting.

Source: Economic Research Service/USDA, using Current Population Survey Food Security Supplement data, 2000-02.

coverage and adequate geographic specificity are not currently available. The primary policy options available to respond to interarea differences in food costs, then, are national-level adjustments to the maximum benefit level and income-eligibility criteria—adjustments that balance benefit adequacy against targeting efficiency.

Food stamp benefits based on just meeting food needs at national average prices are likely to be insufficient to provide a satisfactory diet in areas with higher food costs and to provide more than is needed (thus, reducing benefit-targeting efficiency) in areas with lower food costs. If food prices did not differ greatly from area to area, neither problem would be very large. Evidence from this study, however, indicates that food costs differ considerably across the country. About 17 percent of food stamp participants live in areas where the cost of enough food is 10 percent above the national average or higher. It is likely that many participants

in those areas have inadequate food resources to support healthy food choices. Households that receive less than the maximum food stamp benefit would be similarly affected by high food costs. They are expected to meet part of their food needs out of food stamps and the remainder out of 30 percent of their own income (after certain exemptions). Those combined resources total to the maximum food stamp benefit and would, in many cases, be insufficient to support healthy food choices in areas with high food costs.

An even larger proportion of participants is subject to that level of benefit inadequacy if the reported cost of enough food by low-income households does, in fact, represent the minimum cost of a healthy diet that is consistent with normal food preferences. The national average cost of enough food is about 10 percent higher than the maximum food stamp benefit.

On the other hand, 14 percent of participants live in areas where the cost of enough food is 10 percent below the national average or lower and another 22 percent live in

areas where the cost of enough food is 5-10 percent below the national average. If the maximum food stamp benefit were increased, benefit targeting efficiency would decline as many of those households would receive even larger benefits beyond those required to meet their food and nutrition needs.

Setting national-level benefits will continue to require balancing benefit adequacy against targeting efficiency. Cost-of-enough-food statistics provide perspective on the extent to which food stamp recipients' healthy food choices may be affected by these decisions. Information on the cost of enough food may also help State and local governments assess the need for supplementary food assistance and other forms of support for low-income households.

Information Sources

Nord, M., and E. Leibtag. "Is the 'Cost of Enough Food' Lower in Rural Areas?" *The Review of Regional Studies* 35(3):291-310, Winter 2005.

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Food Spending Patterns of Low-Income Households

Will Increasing Purchasing Power Result in Healthier Food Choices?

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Economic Information Bulletin Number 29-4

September 2007

The Food Stamp Program provides benefits that low-income households can use to purchase food in grocery stores. Research shows that the program is successful in increasing the amount of food purchased and eaten by program participants, who numbered more than 26 million each month in fiscal 2006. However, the rise in obesity and diet-related chronic diseases has focused increased attention on how the program can promote not just an adequate quantity of food (that is, calories), but also healthier food choices, that bring consumption more in line with Federal dietary recommendations.

Fruit and vegetable consumption is particularly low, and the perceived high cost of these foods has been suggested to be a barrier to food stamp participants purchasing and consuming them. This raises the question of food purchasing power as a barrier to making more healthful food choices; for example, if participants received higher levels of benefits, would they purchase more fruits and vegetables? To gain some perspective on this question, this report examines household food spending patterns and how they differ across income levels. Differences in household spending by income can provide insight into how participants might change their food spending in response to additional income.

Because policy discussions aimed at increasing purchase and consumption of fruits and vegetables focus on fruits and vegetables purchased as separate items in grocery stores, this report also focuses on the category of fruits and vegetables in fresh, canned, frozen, dried, or juice forms purchased as separate items in grocery stores. Although both food away from home and “other foods” likely contain fruits and vegetables—such as the lettuce, tomato, and onion in a restaurant’s hamburger or the tomato sauce in frozen lasagna—their cost is likely to be higher than if the fruit and vegetable components had been purchased as separate grocery store items. Previous ERS research indicates that, on average, food away from home accounts for less than half a serving of fruit daily



USDA/NAL

and one and a quarter servings of vegetables, most of which are fried potatoes.

Food Stamp Benefits as Income

Food stamp benefits provide participants with increased income for food purchases. These benefits are not targeted to specific foods; participants are free to buy almost all foods available for sale in participating grocery stores (hot prepared foods are a major exception). Research has shown that food stamp benefits increase food purchases but by less than the full amount of the benefits. Although benefits may be used to purchase only food, a typical food stamp household will cut back on some of the cash previously used to buy food to meet other pressing non-food needs, including housing, energy, and medical goods that compete for a household’s budget. Thus, food stamps not only increase spending for food purchasing but also increase the household’s nonfood spending.

Despite shifting some cash to nonfood needs, participation in the Food Stamp Program increases spending on food. Estimates of the extra food purchased as a result of a \$1 increase in food stamp benefits range from 17 to 47 cents. Investigating how households spend additional income on food provides insight into the likely effects of an increase in benefits on fruit and vegetable purchasing and consumption. An increase in income would be equivalent to an untargeted benefit increase—that is, like current food stamp benefits, increased benefits could be used to purchase whatever foods participants chose (other proposals to provide targeted increases, such as vouchers or bonuses specifically for fruits and vegetables, are discussed in “Improving Food Choices—Can Food Stamps Do More?”).

To fully investigate whether additional food stamp benefits would increase fruit and vegetable purchases, data are needed that differentiate between purchases made by food stamp benefits and purchases made by cash income. In the absence of such data, we turn to the Bureau of Labor Statistics’ Consumer Expenditure Survey (CEX) and its data on household spending. The CEX enables us to link income to total household food purchases, purchases of “food away from home” (at dine-in and carryout restaurants), and food purchased in grocery stores (separated into five food categories). Tracking purchases across major food categories is important because of the competition for a household’s food dollar.

Convenience and Enjoyment Compete With Nutrition for the Food Dollar

Food spending patterns of low-income households reveal that, in addition to nutrients, these households seek other qualities, such as taste, variety, convenience, and enjoyment, from their food expenditures. Data from the 2004-05

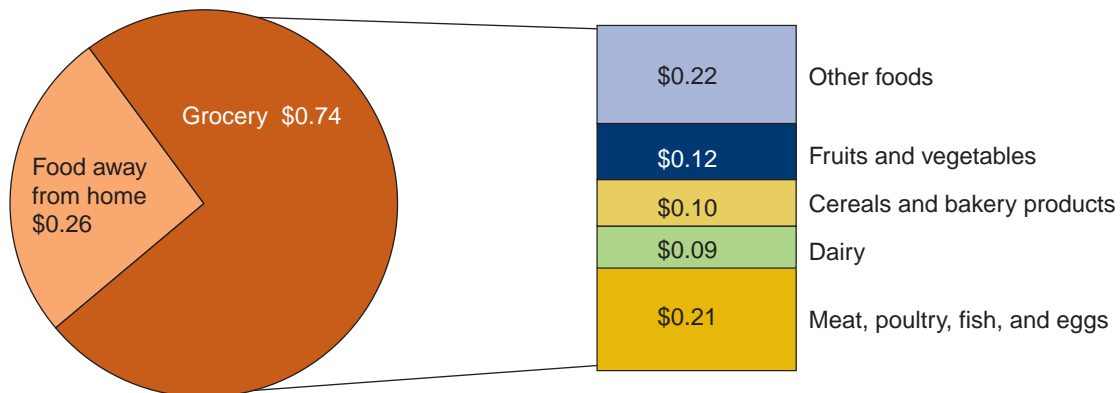
CEX shows this pattern by capturing the assorted uses of the food dollar. For example, four-person households with annual before-tax incomes between \$10,000 and \$14,999 (the lowest income group we examine, representing households with incomes of about 50-75 percent of the Federal poverty level) spend 26 cents of a food dollar on food away

Investigating how households spend additional income on food provides insight into the likely effects of an untargeted benefit increase.

from home (fig. 1). Although the composition of food away from home varies and the types of food away from home are not recorded in the CEX, ERS research shows that, on average, the foods consumers choose to eat away from home are higher in calories but lower in nutrients than the foods they choose to eat at home.

The lowest income households spend the remaining 74 cents of the food dollar in grocery stores (fig. 1). The largest expenditure, 22 cents, is for “other foods”—a miscellaneous catchall that includes frozen prepared meals, canned and packaged prepared foods, snack foods, condiments and seasonings, sugar and other sweets, fats and oils, and nonalcoholic beverages. Meat purchases are a close second, accounting for 21 cents of the food dollar. Fruits and vegetables (fresh, frozen, canned, dried, or in the form of juice) are the third largest category purchased, at 12

Figure 1
Competing uses of the food dollar among low-income households¹



¹Four-person households with annual before-tax incomes of \$10,000-\$14,999. Source: Consumer Expenditure Survey, Bureau of Labor Statistics, 2004-05.

cents, more than cereals and bakery products (10 cents) or dairy products (9 cents).

Many factors affect food spending. In this report, we focus on food spending patterns of four-person households at different income levels, thereby comparing lower income and higher income households of equal size. This simple, intuitive approach can yield valuable insight into the food spending changes associated with income.

Food Spending Increases With Income

As income increases, total food spending also increases, although the increase in food spending is smaller than the increase in income (fig. 2). Most households with annual incomes between \$10,000 and \$29,999 may be eligible for food stamps at least part of the year since these income levels represent 50-150 percent of the Federal poverty level. Average food spending increases from \$413 per month for households with incomes of \$10,000-\$14,999 to \$487 per month for households with incomes of \$20,000-\$29,999 (table 1). Monthly food spending increases to \$679 and then to \$870 among households in the two highest income categories, those with annual incomes beginning at \$50,000.

This pattern is consistent with Engel’s Law, a phenomenon first observed by Ernst Engel, a 19th century German statistician who served as director of the Bureau of Statistics in Prussia. He found that, as income increases, food spending also increases but the proportion of income devoted to food declines. In the CEX data for the United States, food spending rises from \$413 to \$870 per month across the seven income categories, but the share of income devoted to food drops from 37 percent for the lowest income households to

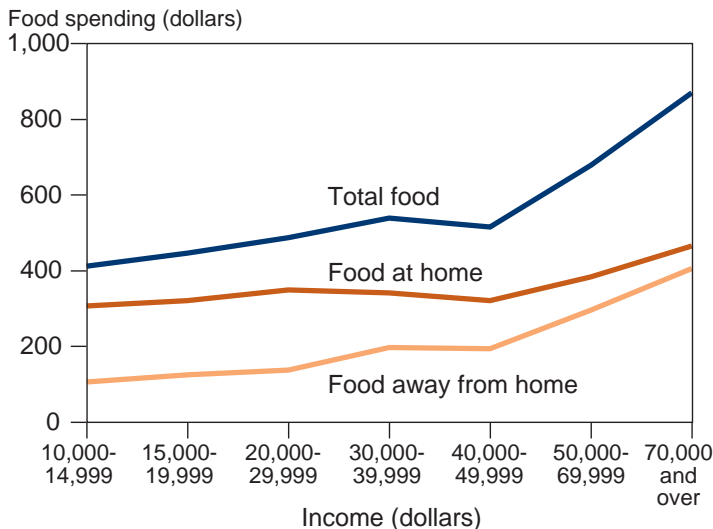
only 9 percent for the highest income households (those with annual incomes of \$70,000 or more) (fig. 3). Even though food spending roughly doubles (from \$413 to \$870) between the lowest and the highest income group, average (after-tax) income increases by more than eightfold (from \$13,290 to \$116,543), resulting in a lower income share for food. The intuition behind Engel’s Law might be described as a “food first” budget allocation for low-income households. Because food is an essential need, even low-income households must devote at least a minimum amount to meet that basic need. As income increases, households may spend some of that additional income on food but increase their spending more than proportionately on other, nonfood items.

The biggest driver behind the pattern of rising food spending is food away from home, which increases across the seven income categories by \$299 (from \$107 to \$406)—and accounts for two-thirds (65 percent) of the \$457 increase in food spending (see fig. 2). Spending on food away from home increases by so much that its share of the food budget increases with income from a low of about one-quarter (26 percent) to nearly half (47 percent) for the highest income households (fig. 4).

Household Spending on Fruits and Vegetables Is Steady Across Most Incomes

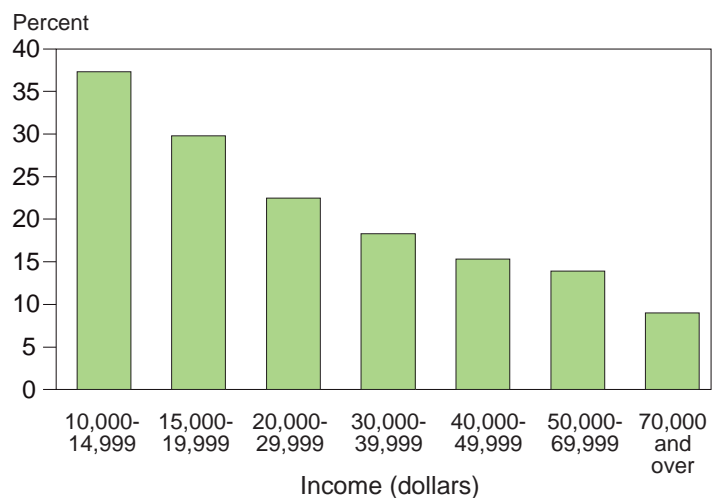
Food stamp benefits are designed to be used in grocery stores. For all income levels, food spending patterns at the grocery store are consistent with what we found for the lowest income households (see figs. 1 and 5). Spending on “other foods” always exceeds spending on meats, which always exceeds spending on fruits and vegetables, which always exceeds spending on cereals, which exceeds spending on dairy products.

Figure 2
Monthly food spending among four-person households by annual household income



Source: Consumer Expenditure Survey, Bureau of Labor Statistics, 2004-05.

Figure 3
Share of annual household income spent on food
Share of income spent on food declines as income rises



Source: Consumer Expenditure Survey, Bureau of Labor Statistics, 2004-05.

Table 1

Average monthly food spending among four-person households by annual household income¹

Food expenditures ²	Before-tax income						
	\$10,000- \$14,999	\$15,000- \$19,999	\$20,000- \$29,999	\$30,000- \$39,999	\$40,000- \$49,999	\$50,000- \$69,999	\$70,000 and over
After-tax income (dollars):							
Annual	13,290	18,034	25,937	35,440	44,478	58,679	116,543
Monthly	1,107.50	1,502.83	2,161.42	2,953.33	3,706.50	4,889.92	9,711.92
Total food spending (dollars)	413	447	487	540	515	679	870
Share of after-tax income (percent)	37.3	29.8	22.5	18.3	15.3	13.9	9.0
Food away from home (dollars)	107	126	138	197	194	296	406
Share of total food spending (percent)	25.8	28.2	28.3	36.6	37.6	43.5	46.6
Food at home (dollars)	307	321	349	342	322	384	465
Meat, poultry, seafood, and eggs	87	78	99	89	84	94	110
Fruits and vegetables	50	54	55	49	51	57	76
Cereals and bakery products	42	49	47	46	45	53	65
Dairy products	37	37	39	40	40	46	52
Other food	92	103	109	119	102	134	161
Share of at-home food budget (percent)	29.9	32.2	31.3	34.8	31.6	35.0	34.7
Sample size (number of households)	502	541	1,349	1,508	1,625	2,903	7,240

¹The income measure includes food stamp benefits, so increases in income already take into account the reductions in benefits among food stamp households that may accompany increases in income.

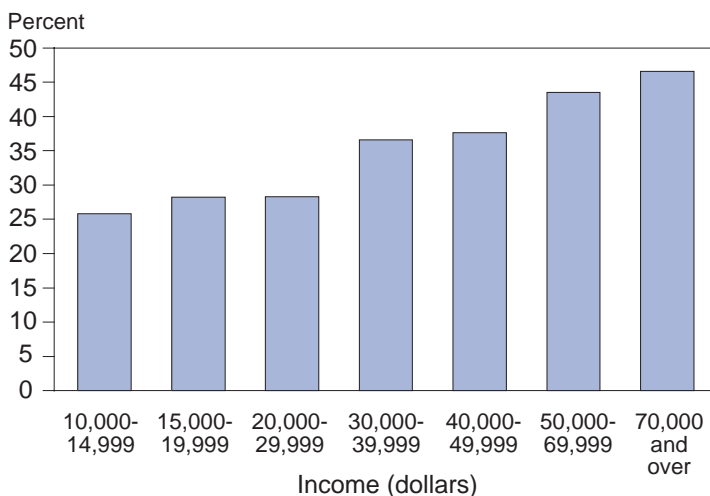
²Food at home consists of foods purchased from grocery and other food stores. Food away from home is comprised of foods purchased from foodservice institutions, such as restaurants, fast food places, and vending machines. Other food includes "miscellaneous"—which includes frozen prepared meals, canned and packaged prepared foods, snack foods, condiments and seasonings, sugar and other sweets, fats and oils, and nonalcoholic beverages. A large proportion of other foods likely contains some meat, cereal, fruits and vegetables, and/or dairy products.

Source: Consumer Expenditure Survey, Bureau of Labor Statistics, 2004-05.

Figure 4

Share of annual household income spent on food away from home

Share of food budget spent on food away from home increases as income rises

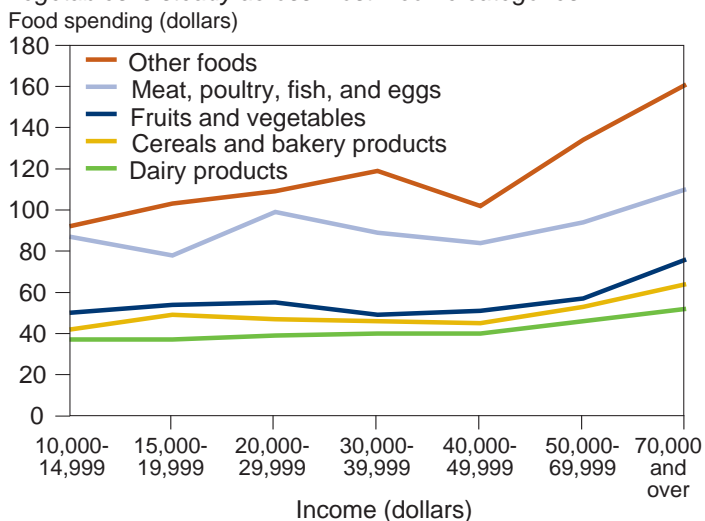


Source: Consumer Expenditure Survey, Bureau of Labor Statistics, 2004-05.

Figure 5

Monthly food spending among four-person households by annual household income

Among four-person households, spending on fruits and vegetables is steady across most income categories



Source: Consumer Expenditure Survey, Bureau of Labor Statistics, 2004-05.

Compared with spending in the other food categories, spending on “other foods” shows an upward trend across the income groups. It typically rises somewhat from each income group to its adjacent group, from a low of \$92 per month among the lowest income households to a high of \$161 per month among the highest income households (table 1).

Unlike spending on “other foods,” spending on meat does not seem to increase systematically with income across most income groups but sometimes rises and sometimes falls as income increases (fig. 5). Monthly spending on meat is \$87 for the lowest income group compared with \$84 for households with an average after-tax income of \$44,478, which is more than triple the average after-tax income of the lowest income group (table 1). Spending on meat then rises to \$94 for households with average after-tax income of \$58,679 and to \$110 for the highest income group. The trend in monthly dollar expenditures on meat among households with incomes between \$10,000 and \$49,999 seems to barely increase, if it rises at all, across income ranges of several tens of thousands of dollars. An upward trend becomes evident only after reaching the two highest income groups.

The relationships between expenditures and income for each of the other major categories—fruits and vegetables, cereals and bakery products, and dairy products—have much in common with the relationship for meat expenditures and income. Dollar expenditures on these categories basically hold steady across five income groups; only in the two highest income groups are increases in expenditures noticeable (fig. 5).

Fruits and vegetables represent a category of particular interest for those wanting to improve the nutritional quality of diets. Monthly expenditures for fruits and vegetables increase from \$50 for households in the lowest income group to just \$51 for households in the \$40,000-\$49,999 income group and to \$57 for households in the \$50,000-\$69,999 income group. It then increases to \$76 for households with incomes of \$70,000 and above (table 1).

Focusing on households in the two lowest income groups (each of which meet the income eligibility requirements for food stamps), we find that monthly spending on fruits and vegetables increases \$4 between households in the \$10,000-\$14,999 group and households in the \$15,000-\$19,999 group (table 1). The associated increase in average income across the two groups is \$5,256, which translates into a monthly difference of \$395. If an income increase of approximately \$400 per month is associated with an additional \$4 in spending on fruits and vegetables at the grocery store, providing these households with an extra \$100 in monthly income (or potentially, in food stamps benefits)

In contemporary America, food spending rises with income...but the form that the additional spending takes nowadays is food away from home and “other foods” at the grocery store.

may spur fruit and vegetable purchases by \$1 per month for the entire household, or roughly one extra apple or banana every week for the entire household. Given that the average food stamp household received \$217 per month in December 2006, a \$100 increase in monthly food stamps constitutes an increase in program expenditures of nearly one-half, or \$14 billion.

Our examination, therefore, shows us two major aspects of fruit and vegetable spending patterns that are important to recognize. First, an unconstrained increase in income barely increases fruit and vegetable purchases across income groups until the highest income group, with annual household incomes of \$70,000 and more. Second, this steadiness in household spending on fruits and vegetables across most incomes is not something “peculiar” about fruits and vegetables but instead matches the same steadiness in spending for meat, grains, and dairy. In contemporary America, food spending rises with income—just as Engel observed 150 years ago in Prussia—but the form that the additional spending takes nowadays is food away from home and “other foods” at the grocery store.

Spending Is Not the Same as Consumption

Food expenditures serve as a proxy for food consumption because they represent the primary means for acquiring food. However, although higher food expenditures may be associated with the purchase of more food, more food can also be obtained by careful shopping and food selection or by avoiding waste from food supplies. Conversely, more expensive foods may be purchased, resulting in higher food expenditures without greater quantities. In addition, food expenditures may differ depending on whether households are spending cash or food stamp benefits.

Evidence shows that a dollar in food stamp benefits increases food purchases by more than a dollar of cash. Thus, food spending patterns can provide but a partial answer to the question of how increasing untargeted food stamp benefits could change food consumption and diet quality. However, these findings, from a major national survey of household expenditures, suggest that additional income would likely

result in little increase in fruit and vegetable purchases. Additional untargeted food stamp benefits may act differently from cash, but the research is not encouraging. A study by Wilde et al., using national food consumption data and employing more sophisticated analytical methods, found that receiving food stamps was not associated with greater consumption of fruits and vegetables.

Low-Income Households Not Likely To Spend Much Additional Income on Fruits and Vegetables

These findings hint at the challenge policymakers face when trying to prompt greater purchases and consumption of fruits and vegetables. If just part of income is used for food purchases, and just a small part of those food purchases are devoted to fruits and vegetables, what could be expected from an untargeted increase in food stamp benefits?

The evidence is not promising for achieving large gains in fruit and vegetable purchases through increasing food stamp benefits (at least to the extent that households respond to food stamp increases roughly as they do to money income increases). To conclude that households do not buy any extra fruits and vegetables as income rises may be too strong: Households in the two lowest income groups do, in fact, spend more on fruits and vegetables when income goes up—just not very much more.

Even higher income households do not consume enough fruits and vegetables to meet recommendations, suggesting that other factors besides income play a strong role in fruit and vegetable purchasing behavior.

The conclusion that low-income households are not likely to spend much additional income (or untargeted food stamp benefits) on fruits and vegetables is consistent with research findings that nearly all households—not just low-income households—consume low amounts of fruits and vegetables relative to Dietary Guidelines for Americans (DGA) recommendations. The knowledge that even higher income households do not consume enough fruits and vegetables to meet DGA recommendation suggests that other factors besides

income play a strong role in fruit and vegetable purchasing behavior.

With food away from home and “other foods” as the two strong responders to income changes, consumers seem to be choosing to spend their additional income on some combination of increased quality, convenience, and variety. Although these food groups are likely to include some fruits and vegetables, the extent to which they contribute to fruit and vegetable consumption is not known. In addition, their fruit and vegetable contribution is likely to be at a higher cost than the cost of individual fruits and vegetables, representing the cost of increased quality, convenience, and/or variety.

The simple method used here to examine food spending patterns focused on four-person households. For these households, increased spending on fruits and vegetables appears to occur in the food budgeting process only as annual incomes reach and pass \$70,000. This finding is consistent with other ERS studies that used more advanced statistical methods to control for many different household characteristics simultaneously. A study by Blisard et al. (2004) that focused on fruit and vegetable expenditures found that low-income households were unlikely to increase spending on fruits and vegetables when they were given an extra dollar in income or food stamps. As discussed previously, the study by Wilde et al. found that receiving food stamps was not associated with greater consumption of fruits and vegetables. Thus, more sophisticated studies of both food purchasing and consumption support the conclusion that additional income alone would likely lead to little, if any, added purchases of fruits and vegetables.

Targeted benefits, such as bonuses and vouchers for specific foods, such as fruits and vegetables, may be more effective and efficient ways to increase purchase and consumption of the specific foods. Combining bonuses or vouchers with other approaches to dietary change, such as nutrition education, and innovative changes in program design suggested by behavioral economics and consumer psychology may increase effectiveness, although research and evaluation are needed to assess their benefits (see *Nutrition Information: Can It Improve the Diets of Low-Income Households?* and *Making Healthy Food Choices Easier: Ideas from Behavioral Economics* in this series).

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How Do Low-Income Households Respond to Food Prices?

Biing-Hwan Lin, Joanne F. Guthrie

Economic Information Bulletin Number 29-5

September 2007

Households make food choices based on numerous factors, such as taste, convenience, nutrition, and price. Low-income households spend a larger share of their income on food than do higher income households (Blisard and Stewart, 2007); one might expect food stamp households, therefore, to be especially influenced by price. If this is the case, lowering the price of a healthful, but underconsumed, food or increasing the price of an overconsumed food may be an effective strategy in improving the eating habits of low-income households. Some proposed changes to the Food Stamp Program are intended to encourage healthful food choices by influencing the relative prices of foods. For example, a proposal to offer food stamp participants a bonus based on the amount of fruits and vegetables they purchase could be considered to effectively lower the price of those foods (Guthrie et al., 2007). What effects would such policies likely have on the food choices of low-income households?

To answer this question, it is important to understand how consumers respond to prices and whether low-income households respond more strongly to prices than other consumers do. ERS research on consumers' response to food prices and how it affects their purchases of particular foods can provide insights into the likely effects of price interventions as a strategy to improve food choices.

Response to Price Varies by Type of Food and Household Income

The availability of survey data on household food consumption and purchases has enabled ERS researchers to examine the response of higher and lower income consumers to price. Using the 1987-88 Nationwide Food Consumption Survey data, ERS researchers Huang and Lin (2000) estimated household food demand by segmenting households into three income levels, with the cutoff for the lowest income group the same as the food stamp eligibility cutoff. They found that, in general,



Photo by Joseph Sanford

household demand for dairy products, fruits, and vegetables was more responsive to price than demand for other food categories. Low-income households were more responsive to price changes than high-income households; however, the differences were quite small.

How Does Consumer Response to Price Affect Food Choices?

Would consumer response to price change be large enough to make price manipulation an effective strategy for changing food choices? If so, a policy intervention that manipulated price by providing food stamp participants with a bonus or coupons for purchasing healthful underconsumed foods, thus lowering their price to participants, might be effective in encouraging their consumption. Alternatively, an intervention that raised the price of an overconsumed food might discourage its consumption. Research conducted or supported by ERS has examined consumers' responses to price changes, and found that the answer may vary, depending on the food chosen for price manipulation. The following two examples illustrate this point.

Example 1: Snack Foods

ERS researchers used supermarket sales data to investigate the effect of raising the price of an overconsumed food category on consumers' food purchases (Kuchler et al., 2004). The category they chose was salty snacks, such as chips. They found that consumer demand for these products is relatively unresponsive to price. That is, the percentage decrease in the purchased quantity is less than the percentage increase in the price. Specifically, they concluded that a 10-percent rise in the price of potato chips (about 2 cents per ounce) would decrease annual household purchases of potato chips by 4.5 percent (7 ounces of 156 ounces). Consumers seem to enjoy salty snacks so much that raising their prices by a small amount has little effect.

Example 2: Milk and Soft Drinks

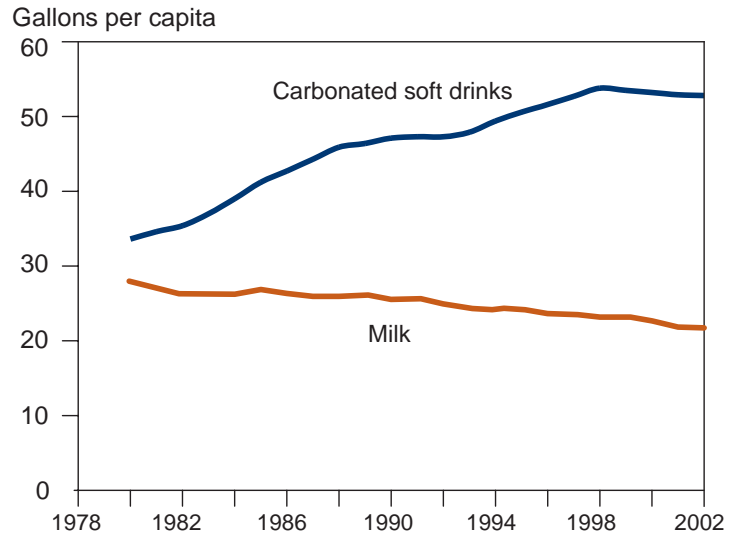
There has been a populationwide shift in beverage consumption in America. Federal dietary guidance urges more consumption of low-fat milk and less consumption of sweetened beverages, such as soft drinks; however, the reverse has taken place. Consumption of soft drinks has soared, whereas milk consumption has declined (fig. 1). The low cost of soft drinks, compared with other beverages, such as milk, is often cited as a reason for these consumption shifts, and this trend in declining milk consumption and rising soft drink consumption is indeed consistent with the trend in relative prices (fig. 2).

Data from the 1996-97 National Food Stamp Program Survey were used to investigate factors influencing beverage purchases by food stamp participants, and price differences in beverages were found to provide a partial explanation for purchasing behavior (Yen et al., 2004). Study findings suggested that a 10-percent reduction in milk price would result in a 14-percent increase in the consumption of reduced-fat milk, and a 10-percent increase in soft drink price would lead to an 8-percent reduction in soft drink consumption. Nutrition knowledge and beliefs were also found to be associated with beverage choice decisions. For example, people who believed that it was important to get adequate servings of milk tended to drink more milk, and people who believed that it was important to moderate sugar consumption tended to drink fewer soft drinks.

The findings of these two studies, one on salty snacks and one on milk and soft drinks, are consistent with the earlier research by Huang and Lin on consumer response to food prices. For some foods, consumer demand is not very price sensitive, so small price manipulations may not induce large responses in purchases—snack foods appear to fall in this category. For other foods, such as milk, Huang and Lin found demand to be more responsive to price. Consistent with this finding, the case study of milk and soft drink

Figure 1

In the past two decades, soft drink consumption soared, while milk consumption declined¹



¹Food availability data is a proxy for per capita consumption over time. Source: Economic Research Service/USDA, Food Availability (Per Capita) Data System, www.ers.usda.gov/data/foodconsumption/

purchasing found a much stronger effect of price on consumer demand for reduced-fat milk. These findings suggest that price manipulation may have varying effects on food purchases across different foods; it may influence consumption of particular categories, such as dairy, fruit, and vegetables, which appear to be most responsive to price change.

How Much Can Price Change Affect Food Choices? Examining the Evidence for Fruits and Vegetables

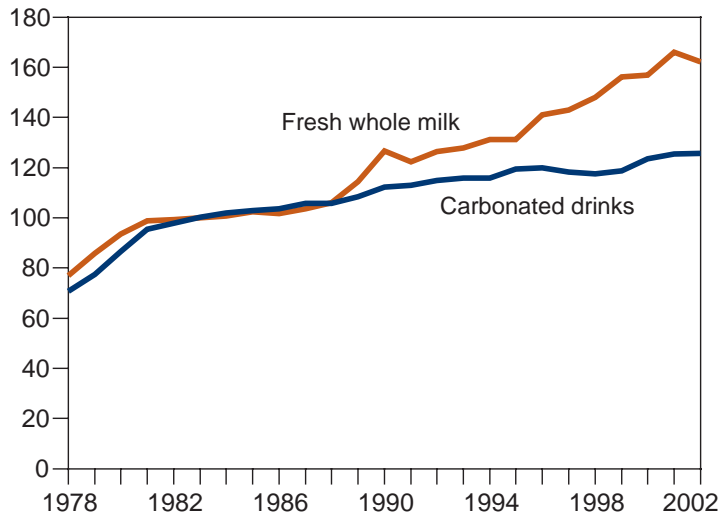
For more than a decade, promotion of increased vegetable and fruit consumption has been a major focus of Federal dietary guidance. Nevertheless, Americans still do not consume recommended amounts of fruits and vegetables (Casagrande et al., 2007). ERS-funded research indicates that lower income consumers eat fewer fruits and vegetables than higher income consumers do. Recently, public health advocates have suggested strategies for increasing fruit and vegetable consumption of food stamp participants that, through either a bonus or some other approach, would effectively lower the price of these foods. To assess the potential effectiveness of price intervention in improving participants' diets, we use the estimates of price responsiveness generated by Huang and Lin, as well as information on current consumption compared with the recommended level. For ease in demonstrating the effects of a discount, a hypothetical 10-percent discount policy option is examined.

ERS research indicates that a 10-percent discount in the price of fruits and vegetables would increase the amount purchased by 6-7 percent. Fruit and vegetable consumption of the average food stamp participant is estimated at 1.95

Figure 2

Consumer Price Index for carbonated soft drinks and milk

Index: 1982-84=100



Source: Bureau of Labor Statistics.

cups per day. A 10-percent reduction in fruit and vegetable prices, therefore, would raise consumption to an estimated 2.08 cups. A 20-percent reduction in price would raise consumption to about 2.2 cups—an improvement, although still below the 3.5-5.0 cups per day recommended for typical adults.

What would be the effect on program costs of adding such a bonus to existing food stamp benefits? According to the food spending data collected by the Bureau of Labor Statistics' Consumer Expenditure Survey, households in the poorest one-fifth of the population spent \$208 per person on fruits and vegetables in 2004. At that spending level, a bonus of 10 cents per dollar spent on all fruits and vegetables would result in an additional \$21 per person per year (if the bonus was restricted to fresh produce, it would result in \$12 per person per year). Given a Food Stamp Program caseload of 25.7 million participants, the annual cost of the bonus can be roughly estimated to be approximately \$0.5 billion if all fruits and vegetables were eligible for the bonus and \$0.3 billion if the bonus was restricted to fresh produce. If the bonus were successful in increasing fruit and vegetable consumption, program costs would rise,

although benefits could also be expected to be greater. New research is underway at ERS to improve these estimates to provide more information to policymakers.

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Nutrition Information

Can It Improve the Diets of Low-Income Households?

Joanne F. Guthrie, Jayachandran N. Variyam

Economic Information Bulletin Number 29-6

September 2007

The Food Stamp Program has a goal of improving the diets of low-income households by providing them with additional food purchasing power. Benefit levels are set to enable participants to purchase a diet that meets current Federal dietary guidance. However, participants are free to make their own food choices from among virtually all foods sold in participating grocery stores. USDA data indicate that food stamp participants' diets do not match recommendations. Fruit and vegetable intakes are low, whereas overweight and obesity rates are high.

USDA encourages food stamp participants to make nutritious food choices through its support of the Food Stamp Nutrition Education (FSNE) component of the Food Stamp Program. According to guiding principles issued by USDA's Food and Nutrition Service (FNS), which administers the Food Stamp Program, FSNE provides science-based, behaviorally focused nutrition education. The intended result of this education is for food stamp participants to make healthy food choices, as defined by the Federal Dietary Guidelines for Americans and the USDA MyPyramid, within a limited budget. Although an optional part of the Food Stamp Program, FSNE now operates in all States, with annual Federal expenditures around \$250 million. Here we examine Food Stamp Nutrition Education—how it has grown over time, funding, operational differences at the State level, and the challenges it faces in improving food choices and demonstrating its effectiveness. We consider the evidence of nutrition information as an effective strategy for dietary improvement, both for the general public and for low-income households in particular, and discuss the research and evaluation needs suggested by our findings.

Food Stamp Nutrition Education

FSNE provides nutrition education to food stamp participants and eligible nonparticipants via a partnership between USDA and States. Unlike food stamp food benefits, which are completely covered by USDA, USDA reimburses States 50 percent of allowable FSNE costs.



Although voluntary, State participation in FSNE has grown from 7 States in 1992 to 50 States, 2 Territories, and the District of Columbia in 2007, with total Federal funding also growing from \$661,076 in 1992 to \$247 million in 2006. The level of State participation varies, with 2006 budgets ranging from less than \$1 in federally approved funds per food stamp participant to more than \$50 per participant. Considering both Federal and matching State funds, on average, available funds translated to less than \$20 per participant as of fiscal 2006.

To operate FSNE, State Food Stamp Program offices subcontract with one or more FSNE-implementing agencies. More than half of these are with the Cooperative Extension Service of the State's land-grant university; other implementing agencies include State or territorial health departments and other public organizations. FNS provides guidance on the appropriate scope of FSNE and reviews State plans for consistency with guidance. Nutrition education messages must be consistent with the Federal Dietary Guidelines for Americans and USDA's MyPyramid. States are encouraged to target educational activities to women and children in participating or eligible Food Stamp Program households.

The *Food Stamp Nutrition Education Systems Review* found that States adhere to the targeting guidelines and serve primarily school-aged children and women (Bell et al., 2006). Almost all (98 percent) States offered direct education, such as group classes, and most (87 percent) offered "indirect education," such as distributing brochures and other print materials. About a third of States employed social marketing approaches, which typically deliver messages on nutrition education and changing behavior through multiple media channels, such as radio, television, newspapers, and posters, and frequently reinforce media messages with in-person activities.

Within these broadly similar categories of educational activities, States use a range of educational methods and materials. This variation in educational approach allows States to tailor their programs to the needs and interests of target audiences but makes it difficult to assess and compare the effectiveness of State activities.

Evidence for the Value of Educational Approaches to Dietary Improvement

In assessing FSNE effectiveness, it is useful to consider the extent to which evidence shows that providing nutrition information, as a general strategy, improves the diets of consumers in general and of low-income households in particular.

Research studies have provided evidence that consumers modify their food choices in response to scientific information linking diet and health (Variyam and Golan, 2002). For example, consumption of whole milk has declined over the past 60 years, while consumption of reduced-fat milk has risen more than threefold. Economic studies have shown that at least a part of this substitution—about 8 percent in one study—is explained by the information about the health effects of fats and cholesterol. Other studies suggest that increases in fat and cholesterol information led to increased consumption of fresh fruits and vegetables and decreased consumption of meats, eggs, and fats and oils.

What is less clear is whether such food substitutions lead to an improvement in overall nutritional quality of diets. Measures of diet quality, such as USDA's Healthy Eating Index (HEI), have been largely static in recent years (Basiotis et al., 2002). And obesity has continued to rise among all sociodemographic groups (Ver Ploeg et al., 2006). Still, the fact remains that, at any given time, there are wide disparities in diet quality and obesity among consumers. What ERS research and other studies suggest is that differences in nutrition knowledge may contribute to these disparities.

Diet quality is the outcome of numerous small, everyday choices.

An ERS study by Variyam and colleagues (1998), using national data from USDA's 1989-90 Continuing Survey of Food Intakes by Individuals (CSFII), showed that, after controlling for sociodemographic characteristics, meal planners' ability to answer an additional question correctly on a nutrition knowledge scale translated to a 7-percent improvement in average diet quality as measured by the HEI. Variyam (2001) also found that children have a greater likelihood of being at risk for overweight if their parents underestimate their own overweight status.

Lower nutritional literacy and poorer quality diets tend to coexist among low-income individuals. Using the 1994-96 CSFII, Gleason and colleagues (2000) found that high-income adults were 10-20 percent more likely than low-income adults to be able to answer specific nutrition questions correctly. This result may be because of the relationship of income and general education. Educational attainment exerts powerful influence on the acquisition and use of nutrition information. Holding income and other factors the same, a meal planner who completed high school is able to answer one more question correctly on a 27-point nutritional literacy test compared with meal planners who did not complete high school (Variyam et al., 1998). As noted earlier, this translates into a 7-percent improvement in the HEI.

Among low-income adults in the Gleason et al. study, food stamp participants and nonparticipants did not differ significantly in their nutritional literacy. However, these data were collected in 1994-96, before expansion of FSNE efforts. Other research suggests that targeted nutrition education, such as FSNE, may have benefits—particularly if it is designed to teach behavioral skills. Hersey and colleagues (2001) used data from the 1996 National Food Stamp Program Survey to examine the shopping practices and food

purchases of food stamp participants. They found an association between using the kinds of shopping practices taught by FSNE—reading nutrition labels, shopping with a list, etc.—and purchasing a more nutrient-rich mix of foods.

Challenges for Effective Education

These studies indicate that consumers with more nutrition information, including low-income consumers, make more nutritious food choices. However, the studies do not prove that providing nutrition education to Food Stamp Program participants will cause them to change their diets. Not all individuals are equally interested in nutrition information—for some, other factors such as taste, convenience, or price may be more important to their food choices.

Nutrition information programs have to compete with other sources of information, which may stymie their effectiveness. While nutrition education strives to elevate consumers' health preferences, consumers get information from other sources that may conflict, confuse, or elevate the salience of other preferences, such as convenience and taste. Although expenditures for FSNE have risen greatly in the past decade, they are far exceeded by amounts spent on advertising for food, beverages, and candy and for restaurant advertising (fig. 1). Conflicting information, preferences, and priorities are a special problem for diet quality because diet quality is the outcome of numerous small, everyday choices. Positive changes in some choices may be offset by other choices—for example, the healthful breakfast followed by the coffee break treat. These offsetting behaviors may explain the pattern of consumer substitutions among foods with little overall improvement in diet quality. Improving dietary quality is a challenge that requires not only information on the appropriate choice to make, but also guidance and motivation to manage conflicting preferences.

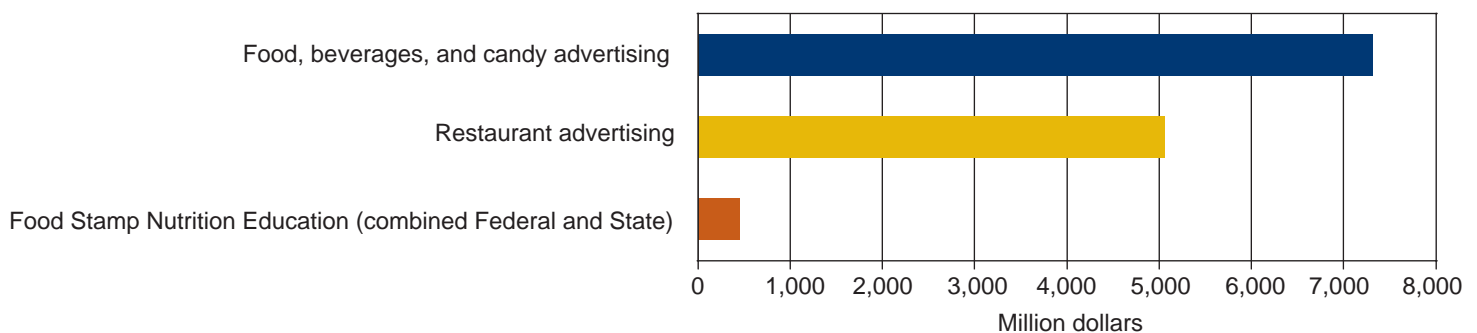
It is important to develop evaluation methods capable of answering the question of whether FSNE, as it exists now, is effective or whether it could be made more effective. A major barrier to answering that question has been the lack of standardized outcome data. The Flexible Consumer Behavior Survey (FCBS), which ERS is sponsoring as an addition to the National Health and Nutrition Examination Survey (NHANES), should provide some help in addressing the basic question of the benefits of nutrition information to food stamp participants. The FCBS includes questions on consumers' diet-related knowledge, attitudes, and behaviors, as well as food stamp participation status, income, and food expenditures. These data, coupled with the dietary quality, measured body weight, and health status data obtained from NHANES, will provide more information on the association between nutrition information and food choices, diet quality, and health in this population. Although these cross-sectional survey data show associations rather than cause and effect, obtaining such data on an ongoing basis will help policy and program officials assess whether progress is being made in educating consumers and improving diets.

This information, although valuable, will not meet all the needs of State FSNE program managers and decisionmakers. The NHANES' costly methods of data collection do not permit a sample size large enough to generate State-level estimates. ERS is working, in close collaboration with FNS and with input from nutrition educators and State FSNE directors, to develop a relatively simple, inexpensive, standardized measure of behaviors associated with dietary quality (Guthrie et al., 2006). This measure could be administered across the United States among adult populations who are eligible for or who are receiving food assistance. As such, it would be a feasible means of collecting sufficient data to generate State-level, other subnational, and national estimates. If we are successful in developing this measure,

Figure 1

Spending on food advertising and Food Stamp Nutrition Education (FSNE), 2005

Although spending on FSNE has grown, it is still dwarfed by food and restaurant advertising



Sources: Advertising spending data: *Advertising Age, Special Report: 100 Leading National Advertisers*, June 26, 2006, accessed at: <http://adage.com/images/random/lna2006.pdf>. Data on FSNE spending: Federal expenditures obtained from Food and Nutrition Service, USDA; total obtained by assuming a 50-percent State funding match.

it could be used to assess progress in improving diets of food stamp participants. It also could be useful in assessing differences in dietary-quality-related behaviors of food assistance program participants at the regional or State level that can guide development and evaluation of more effective nutrition education activities conducted with food assistance program funds.

On a broader front, we need a better understanding of the sustained effectiveness of nutrition information programs. This kind of research requires long-term data on interventions and outcomes. The outlook is encouraging as more such data become available for research. For example, recent ERS research has used several years' worth of data to examine the effect of information provided through nutrition labeling on dietary outcomes, finding positive effects for dietary fiber, protein, and iron intakes (Variyam, 2004).

Finally, research to identify more effective strategies for creating long-term, consistent changes in food choices can enhance the benefits of informational programs. New theories of behavior generated by behavioral economics and consumer psychology suggest promising new approaches that are being more fully explored by ERS researchers.

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Making Healthy Food Choices Easier

Ideas From Behavioral Economics

Lisa Mancino, Margaret Andrews

Economic Information Bulletin Number 29-7

September 2007

When the Food Stamp Program began, its focus was on providing participants with the purchasing power to get enough to eat. Today, with obesity the most prevalent nutrition problem facing Americans at all economic levels, promoting diets that provide enough nutrients without too many calories is also an important objective. Like most Americans, food stamp participants tend to consume too much saturated fat and added sugars and too few fruits and vegetables. In response, the Food Stamp Program has increased its emphasis on encouraging healthful food choices by participants, primarily through expanded nutrition education efforts.

Identifying effective policies to promote healthful behaviors without limiting individual choice is difficult. Traditional economic thinking assumes that consumers who understand and value the relationship between diet and health will rationally respond by choosing to eat a healthful diet. Yet behavioral economics research finds that people regularly and predictably behave in ways that contradict this assumption. Long-term thinking may not always prevail; people may not always make the decisions that would follow from strict expectations of economic rationality, and they may be unduly influenced by seemingly irrelevant factors like package size and shape. Although this may sound discouraging, behavioral economics may suggest some strategies for bolstering the effects of rational change strategies, such as nutrition education.

Findings from behavioral economics, consumer psychology, and marketing research suggest a new array of strategies that can be tested to determine their effectiveness in improving the diet quality of food stamp participants. Unlike more traditional economic approaches, these strategies do not impose costs on those who currently behave in their best, long-term interest, and unlike arbitrary directives that would ban or impose penalties on the purchase of unhealthy foods, they do not restrict freedom of choice. In addition, they do not necessarily impose additional costs to those who are food insecure or



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living at the margins. However, a thorough analysis of costs, benefits, and potential impacts—a task outside the scope of this discussion—would be needed before any strategy could be considered as a policy option.

Simple Commitment Devices May Help Increase Self-Control

Do we really behave rationally to maximize our well-being, as economic theory suggests? Not always, according to behavioral economics. One often observed departure from rational economic behavior is the manner in which consumers change how they rank alternatives depending on the delay of economic costs and benefits. For example, consumers often choose a cheaper, less energy-efficient appliance over one that has a higher retail price even when, because of greater energy efficiency, the initial cost difference would be made up in less than a year. Similarly, an individual may prefer \$10 today over \$15 tomorrow but, if asked to choose between the same two alternatives a year ahead of time, would choose to wait the extra day for \$15. Choosing an economically less desirable alternative simply because it is available sooner suggests the difficulties of maintaining the self-control necessary for long-term thinking. Sensory

cues—such as walking past a plate of brownies or smelling freshly baked cookies—can also weaken resolve. Given the difficulty of maintaining self-control, individuals can improve their longrun well-being through some sort of commitment mechanism that sets limits on current consumption levels.

Within the Food Stamp Program, participants may be more likely to choose foods that are compatible with their long-term health objectives if they make their purchasing decisions before going to the store and finding themselves tempted with less healthful food options, such as salty snack chips and soft drinks. One way to do this would be allowing participants to elect an option to preorder a food basket for delivery or pickup, which could be done through local nonprofits or commercial grocery outlets.

USDA’s recent experience with demonstration projects in Connecticut and North Carolina provides some evidence that a segment of elderly food stamp participants does indeed view preordering a commodity foods package as a way of making more healthful dietary choices (Cody and Ohls, 2005).

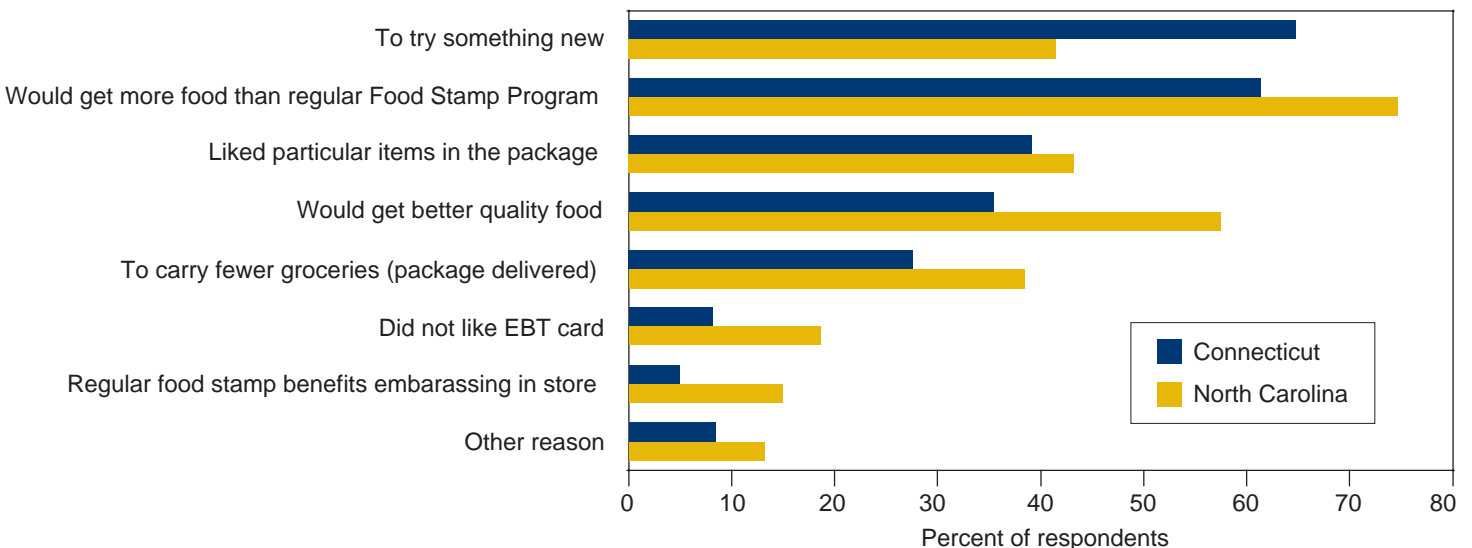
In 2002-04, Connecticut ran a Food Connection demonstration in 10 towns in the Hartford region where, instead of standard food stamp benefits (issued by Electronic Benefit Transfer (EBT)), seniors could elect to receive bimonthly food packages that were available in three commodity combinations—regular, Latino, and items geared towards Meals on Wheels participants. Packages were distributed at various community sites, most commonly senior centers, housing complexes, and churches. In a similar effort, North Carolina ran a Commodity Alternative Benefit program in rural Alamance County in 2002-05, where seniors could elect to

receive one of two commodity food packages each month instead of food stamp benefits. Although the two food packages differed slightly in terms of items or quantities, each monthly package consisted of six bags, five with canned foods and one with butter, cheese, and frozen meat and poultry. For both demonstration sites, the cost of the food packages was limited to that of the average benefit received by senior households—about \$45—which included the cost of the food, shipping, and storage. The comparable price of the package contents at a local grocery store was between \$60 and \$70.

The average elderly participant in the demonstrations got more food than could have been bought with the usual benefit, which was a powerful incentive affecting his or her decision to participate. But, evaluation results from both sites suggest that getting better quality food was also a significant reason for participation among those who elected the commodity alternative. More than half of surveyed participants in North Carolina who elected the commodity alternative mentioned getting better quality food as a reason for participating, as did more than a third in Connecticut (fig.1).

Quality of food was even more frequently mentioned by surveyed seniors who chose not to participate; 59 percent of surveyed households that did not select the commodity option in North Carolina and 69 percent in Connecticut believed that they could get better quality food at stores. Further research is needed to determine the extent to which their perception of the quality of food is associated with nutritional value, whether participants seeking to improve their diets would find it helpful to select a commodity pre-commitment option, and, if so, how much their diets would improve.

Figure 1
Reasons correspondents gave for selecting commodities over EBT in elderly nutrition pilot studies in Connecticut and North Carolina



Note: Clients could provide more than one reason.
 *Significantly different from Connecticut (alpha=0.05).

These findings highlight the different preferences that individuals had for the commodity option: Some felt it improved the quality of their food choices; others did not. Thus, offering food stamp participants options for choosing how and when they receive their benefits may be useful.

Another program change that might help some participants avoid impulsive behavior and make better long-term choices is to allow them to increase the frequency with which their standard food stamp benefits are disbursed. Benefits are distributed only once a month, and evidence shows a period of overconsumption shortly after benefits are distributed, followed by a period of rationing or underconsumption later in the cycle (Wilde and Ranney, 2000). This cycle may be even more pronounced among individuals with self-control problems—they will likely spend too much for current consumption at the expense of future consumption. Increasing the frequency of benefit disbursements could function as another commitment mechanism. Thus, decreasing the amount available for current consumption at each decision period, while leaving total payment amount unchanged, could help some clients make better and more time-consistent decisions.

Of course, some less impulsive individuals may prefer receiving food stamp benefits monthly, which may afford them fewer shopping trips or greater ability to obtain volume discounts. Allowing participants to choose weekly, biweekly, or monthly benefits would ensure that participants who wanted a commitment device could get one, while others could choose to stay with the current monthly payment arrangement.

Mentally, We Might Not Be the Most Accurate Accountants

Economic policy approaches that employ food taxes or subsidies would have both an income and a substitution effect. With the positive income effect of a food subsidy, individuals increase food purchases in response to more room in their budgets. This change in price may also have a substitution effect as well, where people purchase more of the relatively cheaper food. In the case of food, lowering food prices may lead to only a slight increase in total food purchases while generating a much greater increase in expenditures on other items.

A contrasting behavioral view is that individuals use mental accounting to categorize their income, earmarking it into categories for specific purposes or specifying that it be used within a certain timeframe. Mental accounting predicts that, once the income is categorized, one will spend the earmarked amount, irrespective of changing market conditions. Thus, if a portion of increased income is dedicated to current food spending, lowering prices within this category

may not be perceived as loosening one's total budget and instead cause an individual to increase only food purchases. In this case, finding a low price on a consumption item may lead to overconsumption rather than substitution.

The idea of earmarking funds and mental accounts may help explain why many studies have found that food stamp benefits raise food expenditures more than does an equal benefit amount given as cash (Fox et al., 2004). If this is the case, then program modifications that would provide further guidance on the share of food stamp allotments that should go toward purchasing healthful foods, such as fruits, dark-green vegetables, and whole grains, could have the effect of increasing the purchase of more healthful items among program participants.

While there is little direct research that supports this specific application, the general concept of mental accounts has been demonstrated. Thus, it is conceivable that program-selected earmarks, communicated to participants through special vouchers, supermarket-generated coupons, or educational outreach, could be effective. Ongoing Food Stamp Nutrition Education efforts, a component of the Food Stamp Program, may provide some insights in this area. Another similar approach would be to allow individual participants to impose their own earmarks by putting limits on the amount of EBT benefits they could use to purchase less healthy foods. However, monitoring the types of foods and beverages purchased with EBT benefits would require substantial cooperation of food retailers and administrative effort. The complexity and cost of limiting the types of foods allowed for purchase with food stamp benefits have been cited by USDA's Food and Nutrition Service as major barriers to adopting such an approach (USDA, 2007). Certainly, studies assessing cost and feasibility would be needed before implementing such strategies.

We Won't Judge a Book by Its Cover, but We Might Judge a Serving by Its Container

According to ERS data on food consumption, the daily quantity of calories (per capita) available in the U.S. food supply increased by more than 500 calories between 1970 and 2004. Americans are eating more food. For people trying to manage health and weight, choosing the right amount of food may be just as difficult as choosing the right types of foods. Studies find that choosing what to eat and how much to eat may be controlled by separate psychological mechanisms (see Just et al., 2007, for a review of the consumption volume literature).

The increase in portion sizes over the last 25 years or so is often cited as a contributor to the rise in obesity in the United States. Research shows that people eat more when presented with larger portions or packages. They are also less

accurate in assessing their own intake: They underestimate their own total consumption more when eating from larger packages than when eating from smaller packages.

The shape of serving containers—bowls, plates, and glasses—can significantly affect consumption volume as well. People tend to fill tall thin glasses less than short wide glasses that hold the same volume. Experiments have also shown that, when people were randomly given bigger serving bowls or ice cream scoops, those people unknowingly served themselves (and ate) significantly more ice cream than people who were given smaller bowls or scoops.

Research also shows that other alterations in food packaging or presentation may make assessing consumption volume easier. Introducing more intermediate packaging in containers of chips or other items bought in large quantities appears to draw attention to consumption volume and make it easier for individuals to determine an appropriate stopping point.

Highlighting the effects of container shape and product packaging on consumption volume in Food Stamp Nutrition Education would be one way to incorporate these findings into the Food Stamp Program. Such advice should, of course, be balanced by acknowledgment that single serving sizes or small containers may be a more expensive alternative than buying in bulk.

The Food Stamp Program may have opportunities to apply these findings more directly. For example, the program allows Food Stamp Nutrition Education to provide low-cost “nutrition education and reinforcement materials” (less than \$4 per item). These funds could be used to give interested program participants glasses, dishes, or bowls that contain some sort of visual graphic to indicate appropriate portion sizes. For grocery purchases, lower prices or bonuses for other purchases could be offered to participants for choosing products that are packaged to promote more sensible consumption volume, such as 100-calorie snacks and single-serving soda cans.

Next Steps

Findings from behavioral economics suggest innovative, low-cost ways to improve the diet quality of food stamp participants. Unlike more traditional interventions, such as

changing prices or banning specific food items, many of the proposed changes could be targeted to only participants who wanted to make choices that are more harmonious with their own long-term health objectives. These changes have the added benefit of being more flexible and less paternalistic than other proposed interventions.

Incorporating some of these techniques, such as increasing the frequency of benefit distributions, into existing programs may require only slight modifications. Other options, like delivering preordered food packages to food stamp households, may be more costly or complicated. As such, an important area for research would be to design experiments and pilot programs to gauge the feasibility and costs of these strategies as well as the potential for change in behavior, and ultimately, improvement in food choices and diet quality.

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How Can We Tell If We Are Making a Difference?

ERS Efforts To Improve Evaluation of Nutrition Outcomes

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Economic Information Bulletin Number 29-8

September 2007

Federal funding for the food assistance and nutrition programs reached almost \$53 billion in fiscal 2006, over half of USDA's budget (Oliveira, 2007). Farmers, food companies, and program participants have unequivocally benefited from the increased food spending and improved food security among participants. However, the limited information we have on the programs' impacts on nutrition and diet quality is mixed. Yet, in times of tight budgets, the pressure to demonstrate program performance increases. Program assessments and evaluations can also help programs respond to changing needs and environments.

The Food Stamp Program is one of the largest public assistance programs in the Federal safety net. Its large budget, by itself, would result in keen interest in assessing its performance. Another reason for interest is the marked evolution in nutrition concerns since the program was first designed. The program was designed to address problems related to insufficient quantity of food. Today, obesity is the most common nutrition problem among Americans, a result of consuming too many calories in relation to energy expenditures. In addition, the food choices Americans make—too much in the way of solid fats and added sugar and too few fruits, vegetables, whole grains, and other healthful foods—contribute not only to the obesity problem but also to the risk of chronic diseases, such as heart disease, hypertension, and cancer. Thus, improving diet quality has become an increasingly pressing concern. The Food Stamp Program has responded with an increased emphasis on nutrition education, promoting healthful choices while still allowing program participants to make their own decisions. Given these new priorities, how can we tell if the program is making a difference in nutrition and diet quality and, if so, how much of a difference?

Unfortunately, evaluating effects of the Food Stamp Program on diet quality is complex, expensive, and time consuming. Most existing research on nutrition and health effects of food assistance programs share three key



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limitations: the difficulty in separating the effect of the program itself from other factors that may be related to program participation (that is, selection bias); relative age of the data (which do not capture current programs or population behaviors); and use of outdated dietary standards and assessment methods. In addition, conducting new evaluations is typically very costly, both in terms of dollars and time. To alleviate some of these problems, ERS has made it a priority to improve the necessary tools for evaluation—in particular, improved data, measures, and analytic methods.

Improving Data: The ERS Data Initiative and the Flexible Consumer Behavior Survey

Timely, accurate, and comprehensive data are needed to improve outcome evaluation efforts for food assistance programs. The ERS Consumer Data Initiative is designed partly to improve evaluation by enhancing existing Federal data in a cost-effective manner. Major strategies include (1) adding important questions to existing surveys, such as consumer behavior questions in the National Health and Nutrition Examination Survey; (2) expanding use of private-sector data, such as Nielsen HomeScan

Requirements for a Proposed Instrument To Measure Outcomes of Nutrition Education Efforts

The proposed data collection tool should be broadly applicable in measuring the outcomes of nutrition education efforts and contribute materially to the overall advancement of nutrition education evaluation by increasing the measurement consistency across evaluations, thus making them more comparable and more interpretable. Consistent with these goals, the following objectives are particularly applicable:

- The instrument should be relatively short. This will increase the use and acceptability in a broad range of evaluation contexts, where the resources available for evaluation data collection are limited. It will also increase response rates. We visualize the instrument requiring no more than 15 minutes to be administered.
- The instrument should be technically correct. Such issues as question flow and skip logic should be conducive to successful interviewing. The instrument's indicators of nutrition knowledge also should reflect sound nutrition research.
- The instrument should be applicable and understandable to a wide cross-section of the low-income population, as defined by such factors as ethnicity, urbanicity, and region of the country. Dietary knowledge and practices tend to be highly influenced by

cultural orientation. Different groups in the population may routinely use different language or different words to refer to similar concepts. Ensuring that the final instrument is general enough to accommodate such differences is important.

- The method for administering the instrument should be flexible. Because telephone interviews require relatively fewer resources, they are often the data collection mode of choice in evaluation work. However, there may be some evaluation contexts where one-on-one in-person interviewing fits better into the overall evaluation plans. Furthermore, in the current context of nutrition education programs, many evaluations may take place in group settings, so the instrument should also be suitable for this approach.
- The instrument should assess behaviors consistent with current dietary guidance. The instrument is intended to assess dietary behaviors that are consistent with the 2005 Dietary Guidelines and the MyPyramid Food Guidance System, covering such topics as intake of particular foods, amounts of food, and weight management. The instrument can be used to target nutrition education efforts and to determine changes following nutrition education.

food purchase data; and (3) enhancing the value of existing survey data through linkage with administrative data from Federal programs.

As a part of its new consumer data initiative, ERS has developed a Flexible Consumer Behavior Survey (FCBS) module, which, starting in 2007, will be included in the National Health and Nutrition Examination Survey (NHANES). The new FCBS—which has been tested with both average and low-income audiences—collects food-related knowledge, attitude, and behavioral data, including knowledge and attitudes concerning Federal dietary guidance, use of food labels, expanded measures of food assistance program participation, food expenditures, food availability, and food-away-from-home habits. The resulting data set will have the unique ability to link knowledge, attitude, and behavior variables to food consumption, health, and program participation data in a nationally representative sample. We will be able to identify food stamp participants and eligible nonparticipants within this sample, making it useful for examining program outcomes related to diet quality and health. Although the expanded data provided by the FCBS does not directly solve the problem of selection bias, it will improve our understanding of the relationship of important economic and policy factors to program participation and outcomes and could expand analytical options for addressing selection bias.

Improving Measures: FSNE Measure Development

Food Stamp Nutrition Education (FSNE) is USDA's major activity to promote healthier food choices by food stamp participants. However, no uniform national data on outcomes associated with FSNE are currently available. ERS is working in close collaboration with the Food and Nutrition Service, the USDA agency that administers the program, to develop a relatively simple, inexpensive, standardized measure of behaviors associated with dietary quality. This measure could be administered among adult populations across the United States who are eligible for or who are receiving food assistance (see box, "Requirements for a Proposed Instrument To Measure Outcomes of Nutrition Education Efforts"). When completed, it will provide a feasible means of collecting sufficient data to generate State-level, other subnational, and national estimates. It also could be useful in assessing differences in dietary-quality-related behaviors of food assistance program participants at the regional or State level.

Improving Assessment and Program Evaluation Methodology: The new Dietary Reference Intakes

Early studies that measured the nutritional impact of the Food Stamp Program simply compared average nutrient intakes of program participants and nonparticipants, typically as a share of the appropriate Recommended Dietary Allowance (RDA). Findings of higher nutrient intake levels

The DRIs

The Dietary Reference Intakes (DRIs) replace the Recommended Dietary Allowances (RDAs), last published in 1989 by the National Academy of Sciences. In addition to being based on more recent scientific studies, the DRIs also differ in three significant ways from the former RDAs:

- They include, to the extent possible, a reduction in risk of chronic disease, rather than merely the absence of signs of deficiency.
- They employ a new conceptual model that takes into account nutritional problems occurring due to either insufficient or excessive intakes.
- They encompass a more complete set of values, including an upper level—EARs, RDAs, AIs, and ULs (see below).

Estimated Average Requirement (EAR)	The usual intake level estimated to meet the requirements of half the healthy individuals in a life stage and gender group. At this level of intake, the other half of the healthy individuals in the specified group would not have their needs met.
Recommended Dietary Allowance (RDA)	The usual intake level that is sufficient to meet the nutrient requirements of nearly all (97.5 percent) healthy individuals in a particular life stage and gender group. RDAs are estimated by adding two standard deviations to the EAR. Although defined similarly as the 1989 RDAs, the new values may be different from the 1989 values.
Adequate Intake (AI)	The recommended usual intake level based on experimentally derived intake levels or approximations of observed mean nutrient intakes by a group (or groups) of apparently healthy people who are maintaining a defined nutritional state or criterion of adequacy. This measure is used when scientific evidence is not sufficient to establish an EAR (and RDA).
Tolerable Upper Intake Level (UL)	The highest level of usual intake that is likely to pose no risk of adverse health effects to almost all individuals in the specified life stage group. As intake increases above the UL, the potential risk of adverse effects increases.

Source: Institute of Medicine, 2000.

Findings from first-generation dietary assessments consistently show certain nutrients with dramatic dietary deficiencies or excessive intakes among some population subgroups, although they are seemingly unaccompanied by evidence of adverse biochemical, clinical, or anthropometric health problems. Whether these findings represent important or potential dietary problems that might be addressed by policy and program changes or whether they stem from methodological weaknesses in dietary

assessment methods and/or dietary reference standards is not clear. Because the new DRIs were established with the goal of reducing the risk of chronic disease and not just eliminating signs of deficiency, observing or measuring any adverse health impact in the short term (particularly among younger age groups) may be difficult, even though the long-term health impact may still be important.

among participants were then interpreted to indicate that participation in the Food Stamp Program led to “improved” nutrient intake for participants, based on the belief that “more is better,” an approach that may have been appropriate in an earlier era in which underconsumption was the major nutrition issue.

Over the past decade, however, improvements in the knowledge about human nutrient requirements led to the development of a new set of dietary reference standards—the *Dietary Reference Intakes* (DRIs). In addition to being based on more recent scientific studies, the new DRIs also make clear the problems with the presumption that “more is better” (for more details, see box, “The DRIs”).

The first problem is that, once intake is adequate and sufficient to meet dietary needs, consuming more offers no additional benefits. This problem is particularly relevant to studies that compared intakes using the RDAs because the RDA values included a large margin of safety in order to cover

the needs of nearly all healthy individuals. As a result, intakes below the RDA do not necessarily indicate insufficient intake.¹ The second problem is that, for some nutrients, too high an intake may present a problem.

These two problems make it clear that just because average intake for one group is higher than for a second group does not necessarily mean that the first group is “better off.” Instead, they point to the importance of considering the entire distribution of nutrient intake, rather than just the average. This discovery led to the development of a new statistically based methodology to assess nutrient intake using the distribution of nutrient intake and the distribution of requirements. The new methodology allows analysts to estimate the proportion of a population subgroup with inadequate as well as excessive intakes and, thus, provides a better and more meaningful nutrition assessment methodology.

¹However, the lower the intake relative to the RDA, the greater the probability of inadequate intake.

Table 1
Nutrients with dramatic dietary deficiencies or excessive intakes

Nutrient	Findings
Energy	Estimated energy intakes greatly exceed energy requirements for infants and children
Zinc, vitamin A	High share of infants and children have usual intakes above Tolerable Upper Intake Levels (ULs)
Magnesium, vitamin E	All subgroups of the population have high prevalence of inadequacy
Fiber, potassium	Intakes are very low relative to DRI standards

Source: Devaney et al., 2007.

Although the new DRIs and the new methodology have not yet been used to evaluate the Food Stamp Program, they are being used increasingly for general dietary assessments, which are helpful in identifying nutrients of public health interest. Recent findings from first-generation studies, however, have identified some nutrients for which considerable dietary excesses or deficiencies have been estimated, although unaccompanied by any reports of adverse health effects or other type of concern (table 1). These findings have raised some concerns about the accuracy of those DRIs and whether they should be reviewed before they are used for program evaluation or planning.

An ERS-sponsored review of the models and methods used in assessments of dietary intakes relative to the DRIs for selected nutrients concluded that errors in dietary recall data may partially—but not fully—explain some of the findings. For example, the large proportion of adults identified as consuming inadequate amounts of vitamin E may be partially explained by underreporting of food intake. Additional difficulties in collecting reliable data on the amounts and types of fats and oils consumed and highly variable and imputed data on vitamin E values in nutrient composition databases further suggest that vitamin E intake may be underestimated. However, the review also identified a number of limitations in the studies and data used to derive those DRIs, raising the possibility that some DRI values may benefit from additional scientific review (Devaney et al., 2007).

For the remaining nutrients, however, we anticipate that both the new standards and the methodology for assessing nutrient adequacy will be useful for program evaluation,

following the Institute of Medicine’s example of how to apply the new methodology to assess program impact (Institute of Medicine, 2000).

Conclusions

A number of changes in Food Stamp Program policy have been proposed to improve food choices and diet quality of participants. Yet inadequacies of data, measures, and analytic methods have limited our understanding of the program’s effects on food choice and diet quality. Improving evaluation of the current program could provide a better sense of the nature and extent of the problems that need to be addressed. Improving evaluation is also necessary to assess the effects of any proposed changes in the program that are adopted. The problem of selection bias has not yet been solved. Nevertheless, expanded data and better measurement and analytical methods, such as the ability to estimate the change in the proportion of a population subgroup with inadequate or excessive nutrient intakes, will aid us in conducting more definitive evaluations. These evaluations will give policymakers, program officials, and interested citizens the information they need to make better decisions.

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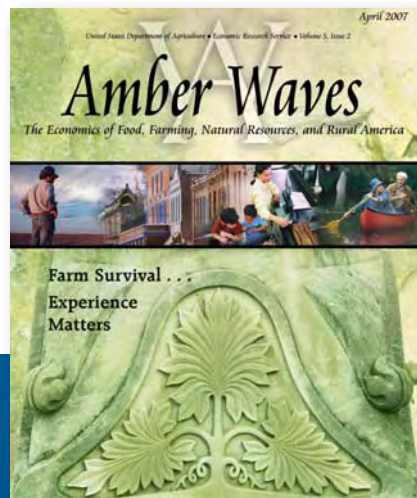
Improving Food Choices— Can Food Stamps Do More?

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Amber Waves Article Reprint

April 2007 • Volume 5, Issue 2

ECONOMIC RESEARCH SERVICE/USDA
www.ers.usda.gov

F E A T U R E

VOLUME 5 • ISSUE 2

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- Proposed strategies for improving diets of Food Stamp Program participants include restricting the types of foods purchasable with food stamp benefits and offering bonuses or vouchers for buying healthful foods such as fruits and vegetables.
- Offering bonuses or vouchers for specific foods essentially lowers their price and gives the household additional income for food purchases.
- Prices and income can influence consumer spending decisions, but effective policies also need to account for the role of consumer preferences and foods available in the marketplace.

When the Food Stamp Program began, its primary purpose was to enable low-income Americans to get enough to eat, providing "stamps" usable only for food but permitting each household its own choices of which foods to buy. Over time, the program has changed from primarily focusing on getting a sufficient *quantity* of food to an increased emphasis on also choosing healthful foods with high nutritional *quality*. This reflects the nutrition-related health problems now facing more and more Americans of all income levels. The prevalence of obesity and diabetes is growing. Nutrition and health experts point to excessive intakes of saturated fat and added sugars, coupled with low intakes of healthful foods such as fruit, vegetables, and whole grains, as major contributing factors.

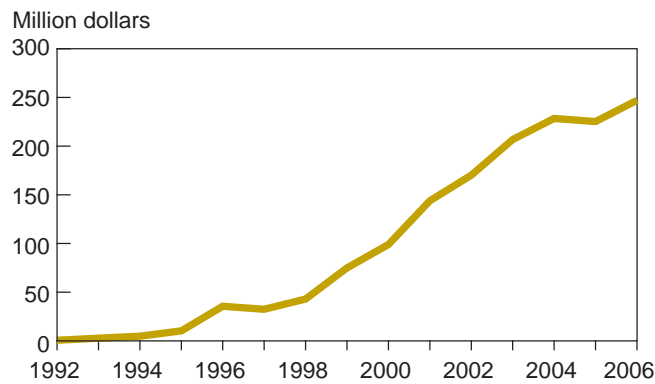
Nutrition Education Reaching Out to Food Stamp Participants

Food Stamp Nutrition Education (FSNE) is an optional component of the Food Stamp Program conducted via a partnership and joint funding between USDA and States. Between 1992 and 2006, total annual Federal spending for FSNE increased from \$661,076 to \$247 million, and State participation expanded from 7 States to all 50 States, 2 Territories, and the District of Columbia.

To operate FSNE, State food stamp offices subcontract with one or more FSNE-implementing agencies. More than half of these are the Cooperative Extension Service of the State's land-grant university. Other implementing agencies include State or Territorial health departments and other public organizations.

Implementing agencies have considerable flexibility in the types of educational activities they conduct. Activities range from small group classes and cooking demonstrations for adults, to classroom activities in schools serving predominantly low-income children, to public service announcements in media outlets that serve mostly low-income audiences. Within this broad range of activities, USDA requires that all education be behaviorally focused, with a goal of encouraging participants to voluntarily make healthful, economical food choices for themselves and their families.

Federal spending for Food Stamp Nutrition Education reached \$247 million in 2006



Source: USDA, Food and Nutrition Service.

To help food stamp participants make more nutritious food choices, USDA has expanded its investment in nutrition education (see box, "Nutrition Education Reaching Out to Food Stamp Participants"). State governments and health advocates are looking at additional modifications to the Food Stamp Program that could reinforce nutrition education, including restrictions on the foods allowable for purchase with food stamp benefits and expanded benefits to buy more of healthful foods, such as fruit and vegetables.

The success of either restrictions or targeted benefits depends on a number of economic factors: the *food stamp budget share* (the share of the food budget covered by food stamps); the *food spending patterns* of program participants; participants' *response to changes in food prices* and their *response to increased income*; and, finally, *food manufacturers' response* to Food Stamp Program changes. Research conducted by ERS on these economic factors provides insight into the likely effectiveness of these program modifications in improving the diets of program participants.

Can Limiting Food Choice Improve Diets?

Food Stamp Program benefit levels are set to allow households to purchase a set of low-cost foods that meet current Federal nutrition recommendations. Program benefits are provided through electronic debit cards that recipients can use to buy just about any foods sold in participating grocery stores, with the exception of hot prepared foods such as rotisserie chicken.

Restricting food stamp participants' purchases of foods and beverages high in calories, fats, and/or sugars has been proposed as a strategy to combat obesity. In 2004, the State of Minnesota unsuccessfully requested permission from USDA to prohibit the purchase of candy and soft



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Targeting food stamp benefits toward healthful but underconsumed foods, such as fruits and vegetables, has been suggested as a way to improve participants' diets.

drinks with food stamp benefits. The proposed modification was clearly intended to promote diet quality by limiting purchase of "empty calorie" foods.

While it may seem obvious that disallowing an "unhealthy" food item would necessarily limit its consumption, in practice such a policy may have limited effectiveness. The issue turns on whether food stamp recipients would continue to purchase the restricted items, using their own funds. This is likely to depend on the *food stamp budget share*. The larger the share of the food budget that is covered by food stamps, the more influence program changes can be expected to have. For most food stamp households, the food stamp

budget share is a sizeable part of their food budget, but it is not the whole amount. For a family of four in fiscal year 2004, monthly benefit amounts varied from almost nothing to as much as \$471, with the average benefit at \$326. At the same time, a four-person, low-income household spent an average of \$462 per month on food, including both food from grocery stores and food prepared away from home. Such a household could continue to buy at least some of the prohibited items with the \$136 cash portion of their current food expenditures. Even if the cash devoted to foodstore purchases is relatively small under current policies, households might use some of their cash

income currently being used for nonfood purchases to buy prohibited foods.

The impact of a food restriction will also depend on the amount of banned foods consumed by food stamp recipients. ERS research on *food spending patterns* shows that of the \$462 spent on food each month by the average low-income, four-person household, \$334 was spent on food from the grocery store. Of this, \$11 was spent on sugars and sweets and \$30 was spent on nonalcoholic beverages. Depending on how much of the spending in these categories is devoted to potentially prohibited items, such as candy and soft drinks, the average family might or might not be able to buy the same mix of foods

using their cash resources. They might have to adjust their purchasing behavior to limit prohibited items, and shift their food stamp purchases to other items.

But does it necessarily follow that they would shift to purchasing fruits and vegetables, low-fat milk, and other healthful foods? Consumers who love candy might choose the natural sweetness of fruit. Or they might switch to cakes, cookies, chocolate-coated granola bars, or any of a number of items that might have only minimal nutritional differences from banned items. In denying Minnesota's request for authority to ban certain candies, USDA noted that the request would prohibit the purchase of Hershey chocolate bars but allowed Kit-Kat and Twix candies (because they contain flour).

The effectiveness of limiting food choices also depends on *food manufacturers' response*. Limiting purchases of less-healthy foods might encourage manufacturers and retailers to develop more healthful products—like snack packs of baby carrots and pre-cut apple slices—and promote them more vigorously. Or food manufacturers and retailers might develop or promote sweets or snack foods very similar to the prohibited items. For example, they might develop a sweet, fruit-flavored drink that is very similar nutritionally to a prohibited soft drink.

The U.S. food market is extremely dynamic, with more than 20,000 new food and beverage products introduced in 2006 alone. It is likely that the market would respond with both healthful, innovative products that nutritionists would applaud

and products that differ little from banned items. In this dynamic food environment, implementing restrictions on foods allowable with food stamp benefits would require continually updating regulations, issuing guidance, and making specific decisions where necessary (for example, is this a prohibited candy bar or an allowable breakfast bar?). More detailed regulations regarding allowable foods also could make food stamp purchases more complicated both for program participants and for the stores that accept food stamps.

Can Expanding Benefits for Healthful Foods Improve Choices?

Rather than restricting choice, another policy suggestion is to encourage positive choices through targeting food stamp

Low-income households of four spend \$54 per month on fruit and vegetables

Food expenditures	Average spending for a household of four, 2004-05			
	Low-income (\$10,000- \$29,999)	Middle-income (\$30,000- \$49,999)	Higher-income (\$50,000 and more)	All
	<i>Dollars per month</i>			
Total food spending	462	527	816	700
Food away from home	129	195	374	298
Food at home	334	332	441	402
Meat/poultry/fish and seafood				
Fruit and vegetables	54	50	71	64
Cereals/bakery products	46	46	61	56
Dairy products	38	40	51	46
Other:				
Sugars/sweets	11	10	17	15
Fats/oils	10	10	11	10
Nonalcoholic beverages	30	31	40	37
Miscellaneous	52	56	81	72

Note: Amounts may not add up due to rounding.
Miscellaneous includes frozen and canned meals and soups; chips, nuts, and other snacks; condiments, etc.
Source: Consumer Expenditures Survey, Bureau of Labor Statistics.



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Food companies have responded to increased interest in health and diet with a myriad of products.

benefits toward healthful but underconsumed foods. This might be particularly useful for fruits and vegetables, underconsumed foods for which a perceived high cost is a commonly cited barrier to increased consumption. In 2004-05, on average, low-income, four-person households spent \$54 per month on fruit and vegetables, \$17 less than higher income, four-person households. Furthermore, an ERS study found that in 2000, approximately 19 percent of low-income households bought no fruit or vegetables in any given week, compared with 9 percent of higher income households.

Food stamp benefits can be designed to increase fruit and vegetable consumption via vouchers redeemable for fruit and vegetable purchases, as is currently done in the WIC Farmers' Market Nutrition Program. Or bonuses tied to the purchase of fruit and vegetables can be offered to program participants. California has passed legislation to conduct a "Healthy Purchase" pilot program. Under this program, for every \$1 of food stamps spent on fresh produce, participants will receive a specified portion back, as a bonus. These bonus or voucher approaches could be expected to influence food choice through

a price effect—they effectively lower the price of the targeted food—and through an income effect—they give the participant additional income to spend on food.

California's approach of tying a bonus to fruit and vegetable purchases has the effect of lowering the cost of produce relative to other foods. If price is the barrier to fruit and vegetable consumption, lower prices should result in food stamp households' purchasing more of the "cheaper" fruit and vegetables. But how much more? This depends on the extent to which participants respond to changes in price, as well as the size of the price change. The more strongly food stamp participants react to lower prices, the larger the effect on diet quality.

Consumer response to price varies for different types of goods, and even different types of foods. ERS research indicates that demand for fruit and vegetables appears to be somewhat more responsive to lower prices than other food categories. For example, a 10-percent discount in the price of fruit and vegetables would be expected to increase the amount purchased by about 6 to 7 percent. Given that estimated fruit and vegetable consumption of the average food stamp participant

is about 1.95 cups per day, a 20-percent reduction in the price of fruit and vegetables would be estimated to raise consumption to about 2.2 cups—an improvement, although still below the recommendation for typical adults of 3.5 to 5 cups per day. (The estimation procedure does not allow extrapolation beyond a 20-percent price reduction.)

Rather than offering a bonus, another approach could be offering participants a voucher that can be used only to buy fruit and vegetables, lowering their price to zero for participants. This approach offers an incentive even to those households currently buying little or no fruit and vegetables.

Lowering the cost of fruit and vegetables either by offering a bonus or by providing a voucher also provides participants with additional food income. Under the bonus scenario, the bonus income adds to overall food purchasing power. Under the voucher scenario, households would likely substitute the vouchers for some of the fruit and vegetable purchases they would have made with food stamps. Again, the result is to increase household income available for food purchases.

What effect will this increased income have on diet quality? It depends on the choices made—more fruit and vegetables, low-fat milk, or whole grains? Or extra sweets and high-fat snacks? Previous ERS research found that receiving food stamps led participants to consume larger amounts of added sugars and total fats, not fruit and vegetables. Coupling a fruit and vegetable incentive program with nutrition education may increase the likelihood that food stamp participants use additional income to make healthful choices. Also, to the extent that the program provides incentives for food manufacturers and retailers to develop and promote appealing fruit and vegetable options, this may influence choice. The California pilot program includes a plan to



Companies act on consumers' wishes for convenient, healthy food options.

work with small stores in low-income neighborhoods to increase produce offerings and market them appealingly.

Changing Consumer Preferences—The Ultimate Challenge

Given that poor diets exert heavy costs in increased medical expenditures and lost productivity, effective policies for promoting healthful food choices among the 26 million low-income Americans participating in the Food Stamp Program could yield considerable benefits. Currently debated options include both restrictive policies that would prohibit buying some less-nutritious foods with food stamps and policies that would target expanded benefits to purchase of selected healthful foods.

Whether policies aim to restrict or expand food stamp participants' choices, it is ultimately the choices participants make that will dictate success in improving diet quality. A restrictive policy may limit purchase of some less nutritious foods, but, given America's diverse and dynamic food industry, it would still be up to the consumer to either choose more healthful products or ones that, although not restricted, are essentially similar to the prohibited item.

Expanding benefits for healthful foods such as fruit and vegetables would be likely to increase their purchase. However, given existing consumer preferences, the predicted increase may not be strong enough, by itself, to bring purchases up to levels in line with current dietary recommendations. The challenge of changing consumer preferences remains. Coupling targeted benefits with nutrition education may increase effectiveness, as could a response by food manufacturers and retailers that resulted in more attractive, highly promoted fruit and vegetable options.

USDA recognizes the challenge. As part of the 2007 farm bill, USDA has recommended strengthening the nutrition education component of the Food Stamp Program. In particular, USDA has proposed investing \$100 million over 5 years to develop and test solutions to the rising rates of obesity. Potential approaches include providing incentives to food stamp participants to buy fruit and vegetables, as well as integrated nutrition education programs to promote healthful diets and physical activity. These efforts would include rigorous independent evaluations to identify effective ways to improve food choice. **W**

This article is drawn from . . .

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