

Using USDA's Thrifty Food Plan To Assess Food Availability and Affordability

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In recent years, a number of Federal and local efforts have been launched to help communities assess and improve their community food security situation. In a food secure community, residents of all income levels have access to sufficient, affordable foods that enable them to lead active, healthy lives. Developing a standard for assessing whether food is available and affordable in a community is complex because a variety of factors come into play. One possibility is to determine how much a family would have to spend in local area stores to buy a specific set of relatively lower cost foods that make up a nutritious diet. In this study, researchers with USDA's Economic Research Service (ERS) used a weekly menu meeting the nutritional and dietary requirements of the Thrifty Food Plan (TFP) to assess food availability and affordability in Washington, DC.

The TFP serves as a national standard for a nutritious diet at a minimal cost and is used as the basis for food stamp allotments (see box). The District of Columbia was selected for this study because it provides a good case study area—it is a central city with a large percentage of food stamp households. Among all States/districts, Washington, DC, ranked first in the proportion of residents receiving food stamps (16 percent in 1999) and second in residents in households with incomes below the poverty line (20 percent in 1997-99).

ERS researchers surveyed 34 large food retailers in Washington, DC, authorized to accept food stamps—21 chain supermarkets, 7 independent supermarkets, and 6 discount food stores. The small sample size reflects a scope of effort typical of a community-level assessment effort and not that of a full-blown research study. As a consequence, study findings are less precise than would be desired for many research purposes. With these caveats in mind, the study found that food availability was greatest in the chain supermarkets where, on average, all but 1 of the 68 items on the TFP shopping list were available. At the independent supermarkets, all but 8 items were generally available; at the sam-

pled discount food stores, 18 items, on average, were not in stock. Although limited in variety, the TFP shopping list items in the sampled discount food stores cost 16 percent less than in the supermarkets. For the 34 food stores surveyed, the cost of TFP shopping list items averaged \$3.19 less than the estimated nationwide TFP cost of \$101.70 per week in August 2000.

TFP Shopping List Allows Comparisons Across Stores

To determine the availability and affordability of the TFP shopping list in Washington, DC, ERS researchers developed a foodstore survey using the second of two TFP weekly shopping lists. The shopping list used for this study contains 68 food items plus food condiments (the condiments are used in small amounts to prepare recipes). The food items and condiments were assigned to one of eight food groups: (1) grains (bread, cereal, rice, and pasta), (2) vegetables, (3) fruits, (4) milk (milk, yogurt, and cheese), (5) meat and meat alternatives (meat, poultry, fish, dry beans, eggs, and nuts), (6) sugars and sweets, (7) fats and oils, and (8)

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condiments. The TFP assumes that the foods needed for all meals and snacks eaten during the week are purchased at stores and that all meals are prepared at home. Convenience foods, such as frozen dinners and store-bought cookies, are not

included. The quantities indicated on the list are based on the weekly caloric needs of a man and woman age 20-50 and two children age 6-11.

The TFP shopping list was developed as an example of how low-income families can provide nutri-

tious meals at low cost. The items on the list were chosen to provide all the ingredients needed to prepare a set of recipes for a weekly plan of nutritious meals and snacks that are typical of American diets. The advantage of using the TFP

Thrifty Food Plan Represents a Minimal-Cost, Nutritious Diet

The TFP is a healthful and minimal-cost meal plan that demonstrates how a nutritious diet may be achieved on a limited budget or food stamp benefits. The TFP includes a variety of foods from the major food groups. Food stamp benefit levels are based on the nationwide cost of a TFP market basket developed for a representative family of four, including two adults with two school-aged children.

The present TFP is based on data from USDA's 1989-91 Continuing Survey of Food Intakes by Individu-

als (CSFII) and a Food Price Database assembled from various sources by ERS researchers. To calculate the food plan for a family of four, USDA's Center for Nutrition Policy and Promotion (CNPP) used a mathematical optimization model. The model minimizes deviations from average consumption patterns for food groups (to ensure that TFP foods are foods that people actually eat) and yields new consumption patterns that meet current dietary standards and maintain low cost levels. The dietary standards of the TFP

foods are based on the 1989 Recommended Dietary Allowances, the 1995 *Dietary Guidelines for Americans*, the National Research Council's *Diet and Health* report, and the serving recommendations of the USDA Food Guide Pyramid.

To help implement the TFP, CNPP contracted with The Pennsylvania State University to convert the generic set of foods for a family of four into specific menus, recipes, and shopping lists that may be used by food stamp recipients or households with a limited food budget. Two

Food for a Family of Four¹

Fruits and vegetables

Fresh:

Apples	(5 small) 1 lb 4 oz
Bananas	(11 medium) 2 lb 12 oz
Grapes	1 lb 8 oz
Melon	1 lb
Oranges	(22 small) 4 lb 12 oz
Carrots	1 lb
Celery	5 oz
Green pepper	4 oz
Lettuce, leaf	9 oz
Onions	1 lb 4 oz
Potatoes	10 lb 8 oz
Tomatoes	6 oz

Canned:

Oranges	13 oz
Peaches, light-syrup	1 lb 10 oz
Mushrooms	4 oz
Spaghetti sauce	26 oz
Tomato sauce	8 oz

Frozen:

Orange juice, concentrate	7 12-oz cans
Broccoli	6 oz
French fries	11 oz
Green beans	1 lb 7 oz
Peas	15 oz

Breads, cereals, and other grain products

Bagels, plain, enriched	(4) 8 oz
Bread crumbs	3 oz
Bread, French	4 oz
Bread, white, enriched	2 lb
Bread, whole-wheat	1 lb
Hamburger buns	8
Rolls, dinner	4
Corn flakes	1 oz
Toasted oats	10 oz
Flour, white	1 lb 7 oz
Macaroni	1 lb 5 oz
Noodles, yolk-free	1 lb 2 oz
Popcorn, microwave	3 oz
Rice	3 lb 2 oz
Spaghetti	11 oz

Milk and cheese

Evaporated milk	4 oz
Milk, 1 percent	9 qt
Milk, whole	4 qt
Cheese, cheddar	2 oz
Cheese, cottage	7 oz
Cheese, mozzarella	1 oz

¹Provides food for a family of four. Amounts of food shown are for foods actually needed to prepare the Week 2 recipes in *Preparing Meals at Minimal Cost*, CNPP-7B, September 1999.

shopping list to gauge food availability is that the list contains specific items that can be identified and standardized across most food stores. The disadvantage is that the list may not be representative of food patterns in a particular area.

For example, stores in low-income areas of the South, unlike similar stores in other areas, may stock cornbread but not bagels. A standardized list that includes only bagels could indicate an availability problem in the South when the situ-

ation is simply one of differing regional preferences.

Data collectors for the Washington, DC, survey were instructed to record whether the food items on the TFP shopping list were available in sampled food stores. No item

weekly menus and shopping lists, consisting of seven daily menus with three meals and usually one snack per day, were developed. The menus and recipes were evaluated and found acceptable by taste panelists and a representative group of food stamp households.

This study used the TFP shopping list associated with the second week of menus and recipes. That list contains 68 food items as well as a number of condiments. To ensure recommended consumption levels and prevent excess consumption, the

quantities of the various foods were determined based on the Recommended Energy (calorie) level for a family of four. The shopping list assumes all foods are prepared at home. When possible, convenience was incorporated in the choice of food form included in the shopping list. For example, canned broth or bouillon was included rather than expecting a family to prepare soup from stock. However, menus still require that many foods, such as biscuits, be prepared from basic ingredients rather than purchased as

boxed mixes or ready-to-eat foods. Soft drinks, coffee, tea, store-bought cookies and candies—foods that are commonly consumed by the general population—are not included.

The cost of the TFP is updated each month using the Consumer Price Indexes (CPI) for different food categories (CPI for bread, CPI for cheese, etc.). In August 2000, the cost of the TFP market basket for a family of four (male and female age 20-50, and two children age 6-8 and 9-11) was \$101.70.

Meat and meat alternatives

Beef, ground, lean	3 lb 15 oz
Chicken, fryer	1 lb 13 oz
Chicken, thighs	2 lb 12 oz
Fish, frozen	2 lb
Tuna fish, canned	12 oz
Pork, ground	1 lb 7 oz
Turkey, ground	1 lb
Turkey ham	11 oz
Beans, garbanzo (chickpeas)	15 oz
Beans, kidney	15 oz
Beans, vegetarian, baked	1 lb 9 oz
Eggs, large	17

Fats and oils

Margarine, stick	15 oz
Shortening	4 oz
Salad dressing, mayonnaise-type	6 fl oz
Vegetable oil	9 fl oz

Sugars and sweets

Sugar, brown	1 oz
Sugar, powdered	3 oz
Sugar, granulated	9 oz
Jelly	8 oz
Molasses	1 fl oz
Pancake syrup	2 oz
Chocolate chips, semi-sweet	2 oz
Fruit drink	1 gal
Fudgesicles	4

Condiments and spices

Baking powder	.02 oz
Baking soda	.18 oz
Black pepper	.16 oz
Catsup	1.06 oz
Chicken bouillon	.71 oz
Chili powder	.79 oz
Cinnamon	.08 oz
Chocolate drink powder	1.52 oz
Cumin	.05 oz
Onion powder	.22 oz
Garlic powder	.40 oz
Gelatin, unflavored	2.25 oz
Italian herb seasoning	.03 oz
Lemon juice, bottled	.54 oz
Oregano	.18 oz
Paprika	.11 oz
Salt	.13 oz
Soy sauce	2.26 oz
Vanilla	.52 oz

substitutions were allowed although a choice of variety was offered in some instances. For most items on the list, specific container sizes (but not brand) were suggested for pricing. National, store, and generic brands were all examined. Data collectors computed per unit costs for all products meeting the basic item specifications and recorded the lowest cost. Sale prices were used for products on sale, but coupon and other discounts were not included in the price computations.

When the list-specified sizes were not available, data collectors were instructed to determine whether an alternative package size or container for the food was available and to record the package size, type, and lowest unit price. Certain food items on the shopping list required the data collectors to examine different varieties of the food to determine the one with the lowest cost. For example, data collectors pricing melon checked watermelon, cantaloup, and all other varieties and chose the one with the lowest per unit cost.

The food retailers surveyed were chosen from a list of retailers autho-

rized to accept food stamps provided by USDA's Food and Nutrition Service (FNS). The food retailers are self-classified according to a store-type identifier reported on their application for food stamp authorization. These identifiers include supermarkets, grocery stores, convenience stores, specialty stores (such as bakeries, butchers, and other stores specializing in a particular food product), and other stores that accept food stamps (gas/grocery combinations, health food stores, food cooperatives, farmers markets, and produce stands).

At the time of the study, 374 food retailers in Washington, DC, were authorized to accept food stamps. Small grocery stores and convenience stores accounted for 65 percent of the total number of stores accepting food stamps but for only 14 percent of actual food stamp redemptions (fig. 1). In contrast, the 15 percent of stores self-classified as supermarkets were responsible for 60 percent of redemptions. Specialty food stores (9 percent of stores) accounted for 25 percent of redemptions. Nationally, supermarkets account for about the same propor-

tion of stores accepting food stamps but for 77 percent of food stamp redemptions. Likewise, specialty stores account for about 9 percent of stores nationally but for only 4 percent of redemptions.

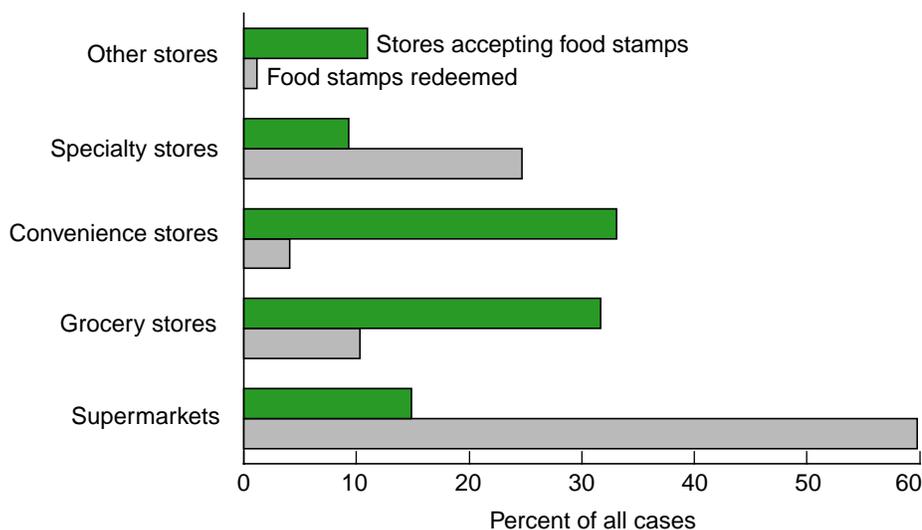
Survey Expanded Beyond Supermarkets

ERS initially planned to limit the survey to stores listed as supermarkets in the FNS list. Previous research indicated that food prices are usually lowest and availability greatest in these stores. However, closer inspection of food stamp redemption patterns in Washington, DC, and store categorizations in the FNS list led to some revisions of this strategy.

In addition to supermarkets, the study identified a chain of discount food stores (self-classified as specialty food stores in the FNS database) as an important outlet for food stamp participants. A significant portion of the food stamp benefits redeemed in Washington, DC, in June 2000 were spent at stores in this chain. Most of the stores reported sales volume similar to that of small supermarkets, and preliminary inspections indicated that the stores carried a variety of food items, including fresh meats, produce, and staple goods. Although these stores were not typical supermarkets, they clearly did not fall within the usual definition of specialty stores either. Because they fill an important market niche for local food stamp participants, six of these stores were included in the survey and given a unique category name—discount food stores—to highlight their special features.

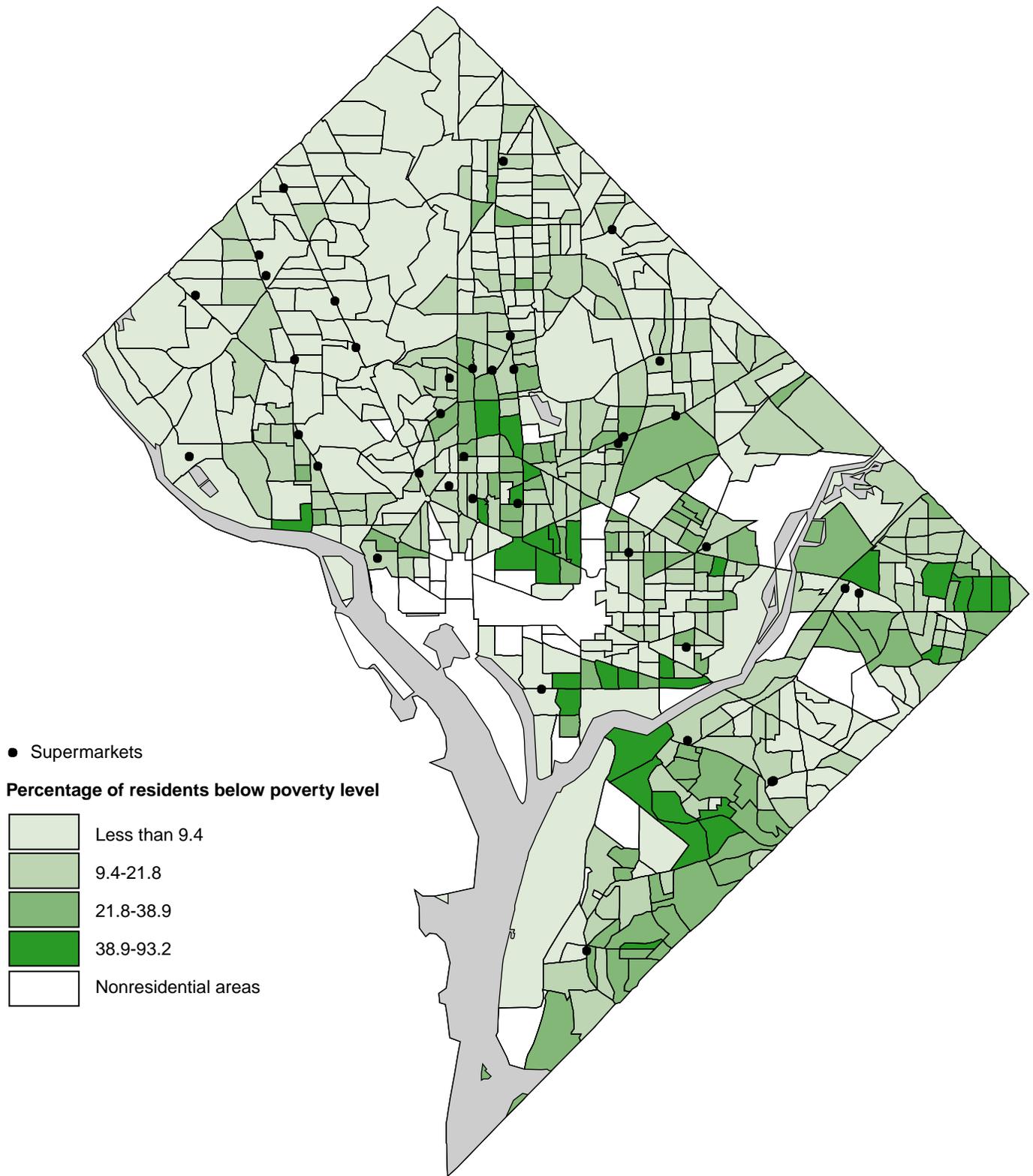
Thirty-seven stores in the FNS list were classified as supermarkets. In general, these stores are located along main corridors in the central business district, northwest area, and northeast area of the city (fig. 2). Supermarkets are more sparsely located in the southeast area, where

Figure 1
Supermarkets Account for 60 Percent of Food Stamp Redemptions in the DC Area, January-June 2000



Source: USDA's Food and Nutrition Service, Food Stamp Redemptions Data.

Figure 2
High-Poverty Areas of DC Are Underserved by Supermarkets



Source: USDA's Economic Research Service, Geographic Information Systems Unit, from 2000 FNS administrative data and 1990 census data on individuals living below the poverty line by census block group.

some of the city's highest poverty neighborhoods are located. The discount food stores (not shown in the figure) are predominately located in the eastern parts of the city.

Among the 37 stores classified as supermarkets, 21 belonged to well-known regional or national supermarket chains and clearly met the conventional definition of a supermarket (that is, a large self-service grocery store, with annual gross sales exceeding \$2 million, offering a variety of packaged foods, fresh produce, and meat). These stores were included in the survey and categorized as chain supermarkets. Two other stores belonging to a natural foods supermarket chain reported large sales volume but were excluded from the survey due to their low food stamp redemption levels. Of the remaining 14 nonchain stores listed in the supermarket category on the FNS list, 7 were included in the survey and categorized as independent supermarkets. The other seven were excluded based on low food stamp redemptions or factors indicating that they did not meet the conventional criteria for a supermarket.

In total, the ERS survey looked at availability and affordability of items on the TFP shopping list at 34 food retailers—21 chain supermarkets, 7 independent supermarkets, and 6 discount food stores. The survey was conducted in August 2000. Data collectors surveyed two to three retailers per day.

Food availability was assessed by determining how many of the 68 food items on the TFP shopping list were found in the stores. Condiments were not assessed. Food affordability was assessed by comparing the total cost of all items on the TFP shopping list in each store with the national cost of the TFP computed by USDA.

Total cost was computed by multiplying the price per unit of each item by the quantity specified on the TFP shopping list. (Costs for the

condiment items were included based on amounts calculated from recipes and menu plans.) Unit prices were used because, in several instances, the item size identified for pricing in the survey did not correspond with the amount specified on the TFP shopping list. For example, the survey specified that the data collector price a 16-ounce bag of frozen peas although only 15 ounces were needed for the TFP shopping list. The cost computation for frozen peas would be based on 15 ounces priced at the per unit cost of the 16 ounce bag. It is thus assumed that any excess purchases would be available for future consumption and count toward food costs in another week's period. For nonperishable items, this assumption is realistic.

If a food item was not available at a food retailer, its cost was estimated as the average price from all other food retailers that had the item in stock when they were surveyed. This imputation procedure is

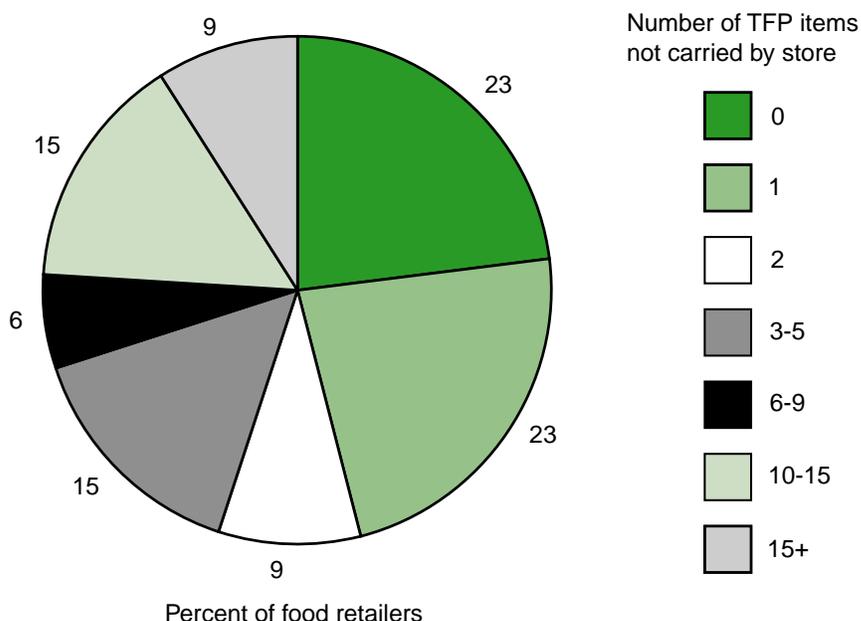
necessary to estimate the cost of the complete TFP shopping list for each food retailer surveyed, though it results in an underestimate of the cost variation among the surveyed stores.

Eight of the 34 food retailers surveyed carried all 68 food items (fig. 3). Eleven of the food retailers sold all except 1 or 2 of the 68 food items. Seven of the food retailers did not sell 10 or more of the items. The food items that most often were not available were ground pork (not available at 79 percent of the food retailers surveyed), fudgesicles (not available at 41 percent of the food retailers surveyed), and yolk-free egg noodles (not available at 32 percent of the food retailers surveyed) (fig. 4).

Costs Lower Than Nationwide TFP Cost...

The average total cost of items on the TFP shopping list for a family of four (two adults age 20-50 and two

Figure 3
Nearly a Quarter of Surveyed Retailers Carried All TFP Items



Source: USDA/Economic Research Service, Food Store Survey, August 2000.

children age 6-11) at the 34 food retailers was \$98.51 per week (table 1). The August 2000 cost for a family of four nationwide averaged \$101.70 per week. The lower cost of the TFP shopping list in Washington, DC,

may seem surprising because food prices are generally higher in large urban areas. The difference can be explained in part by the methods used to calculate the nationwide TFP cost and the TFP shopping list

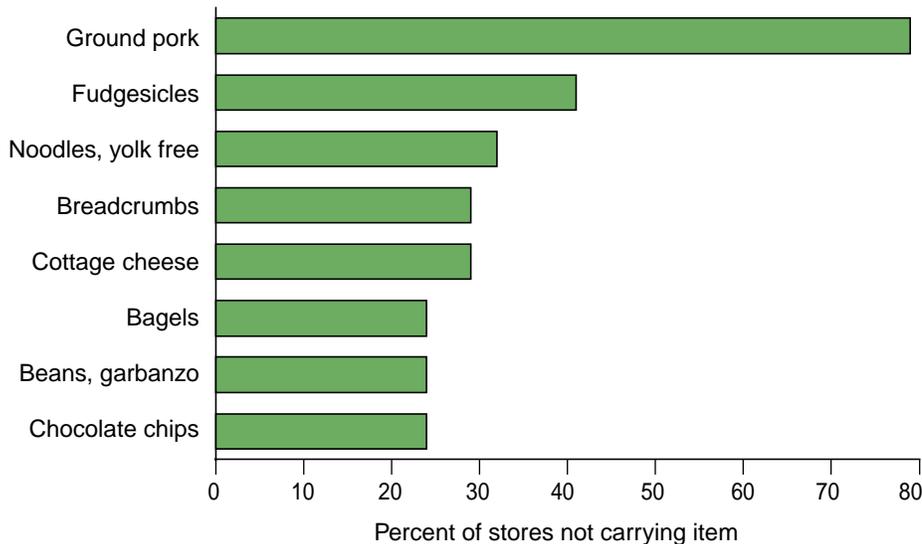
cost. The nationwide average cost of the TFP is based on average prices for the entire country for a wide array of food products in each food category whereas the ERS survey priced 68 specific items plus condiments at the lowest per unit cost available in the store. For example, the cost of spaghetti sauce in the nationwide TFP is based on a weighted average of brand name, store brand, and generic products of different container sizes. The Washington, DC, cost for spaghetti sauce is based on the lowest cost for a 26-ounce jar of spaghetti sauce at surveyed stores.

The shopping list food category with the highest average cost was meat and meat alternatives, which accounted for \$25.98, or 26.4 percent of the total cost of the TFP shopping list (fig. 5). The fresh, frozen, and canned fruits and vegetables categories were also significant cost components, together totaling \$36.88, or 37.4 percent of the total TFP shopping list cost. Fats and oils, which made up \$1.73, or 1.8 percent of the TFP shopping list, was the food category with the lowest average cost. The low cost is not surprising because fats and oils are used sparingly as a part of a low-fat diet and are generally inexpensive.

As expected, the overall cost of the TFP varied substantially by type of store (table 1). In the 21 chain supermarkets, the cost of the TFP shopping list averaged \$100.54; the average cost in the 7 independent supermarkets was \$103.30. Costs were substantially lower in the six discount food stores, where the TFP shopping list, on average, cost \$85.86, about 16 percent lower than the average cost in supermarkets.

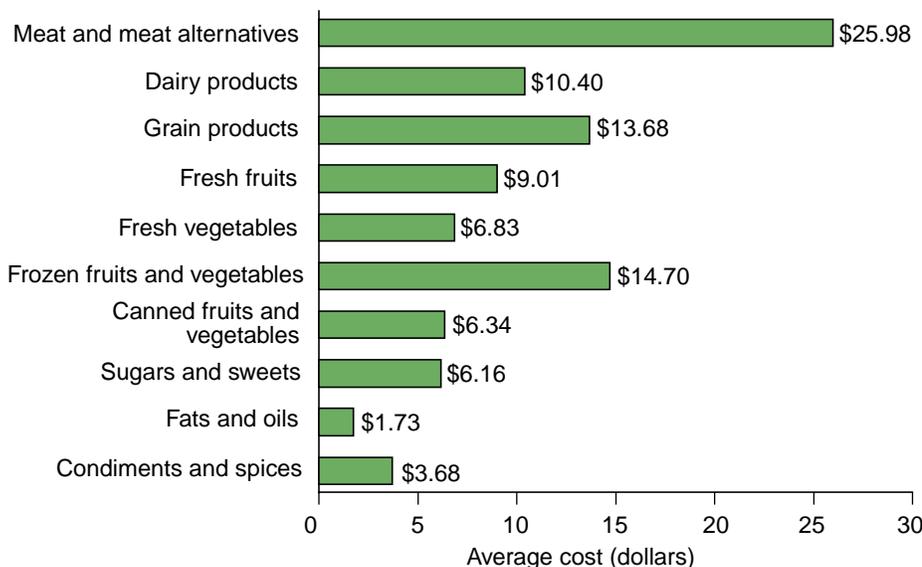
While these results suggest that the discount food stores are successful in supplying affordable food to food stamp participants, it should be noted that food availability was more of a problem in those stores. The average discount food store was missing slightly more than 18 items,

Figure 4
Ground Pork Tops List of TFP Items Missing at Stores Surveyed



Source: USDA's Economic Research Service, Food Store Survey, August 2000.

Figure 5
Meats Take the Largest Bite out of Average TFP Costs



Source: USDA's Economic Research Service, Food Store Survey, August 2000.

about 27 percent of the total number of items in the TFP market basket. In contrast, chain supermarkets averaged 1 missing item, and independent supermarkets averaged 7.7 missing items.

...And Not Very Different in Lower and Higher Poverty Areas

To determine whether the TFP shopping list costs more in high-poverty areas, the 19 Zip Code areas of Washington, DC, were classified by the percentage of the population in poverty. The average cost of the TFP shopping list at the 21 food retailers located in Zip Codes with more than 15 percent of the population in poverty was \$98.26, slightly less than the \$98.92 average cost at the 13 food retailers in less poor areas.

Again, this result needs to be interpreted cautiously. The lower

cost of the TFP shopping list in the higher poverty Zip Codes is largely a result of the greater preponderance of discount food stores in those

areas. Five of the six discount food stores were located in Zip Codes where more than 15 percent of the population lives below the poverty



ERS found that food availability was greatest in chain supermarkets, which on average carried all but 1 of the 68 food items on the TFP shopping list.

Table 1
Supermarkets Best for Availability of Items, Discount Food Stores Best for Cost

Food stores in ERS survey	Stores	Missing items	Weekly cost of TFP ¹
	Number		Dollars
Chain supermarkets ² (total)	21	1.0	100.54
Located in Zip Code areas with:			
Less than 15 percent of residents in poverty	10	.8	99.57
15 percent or more of residents in poverty	11	1.2	101.41
Independent supermarkets ³ (total)	7	7.7	103.30
Located in Zip Code areas with:			
Less than 15 percent of residents in poverty	2	-	-
15 percent or more of residents in poverty	5	6.8	104.48
Discount food stores (total)	6	18.3	85.86
Located in Zip Code areas with:			
Less than 15 percent of residents in poverty	1	-	-
15 percent or more of residents in poverty	5	15.2	85.10
Total sample	34	5.4	98.51
Located in Zip Code areas with:			
Less than 15 percent of residents in poverty	13	4.3	98.92
15 percent or more of residents in poverty	21	5.9	98.26

- = Estimates suppressed due to small sample size.

¹Based on cost for a family of four.

²A supermarket associated with a firm that operates 10 or more stores.

³A supermarket not belonging to a chain, but not always a single-store chain.

Source: USDA's Economic Research Service.

line. As previously noted, these stores have lower prices but less variety in the number of food items available than the chain and independent supermarkets. Furthermore, within the two supermarket categories, the cost of the TFP shopping list is higher in the higher poverty Zip Codes (though the sample size in this study is too small to determine whether the differences are statistically significant). This finding is consistent with prior research that suggests that supermarkets in low-income neighborhoods may have higher prices than supermarkets in nearby higher income areas.

This study illustrates the usefulness of the TFP shopping lists for assessing the availability and affordability of food in a large metropolitan area. Even though the list of foods surveyed does not fully represent the range of the foods consumed in the Washington, DC, area, the ERS survey did generate useful data and store comparisons.

Overall, the findings show that a careful shopper in Washington, DC, can find the foods on the TFP shopping list (foods that conform to

nutritional and dietary standards) at a relatively low cost. By that standard, food in the city is affordable and available. However, food affordability and availability also need to be assessed within the geographic and socioeconomic resources of target populations. The ERS study did not assess any time, transportation, or travel-cost issues that might prevent low-income food stamp participants from accessing affordable food. These factors could be more of an issue in higher poverty areas of the city where supermarkets are less accessible and where other food stores, such as the discount food stores surveyed in this study, carry a more restricted range of products.

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