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Can Low-Income Americans Afford a Healthy Diet?

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Abstract

Many nutritional professionals believe that all Americans, regardless of income, have access to a nutritious diet of whole grains, lean meats, and fresh vegetables and fruit. In reality, food prices pose a significant barrier for many consumers who are trying to balance good nutrition with affordability. The Thrifty Food Plan (TFP), commonly cited as a model of a healthy low-cost diet, achieves cost goals by relaxing some nutrition constraints and by disregarding the usual eating habits of the American population. Diet optimization techniques, when sensitive to cost and social norms, can help identify affordable, good tasting, nutrient-rich foods that are part of the mainstream American diet.

When incomes drop and family budgets shrink, food choices shift toward cheaper but more energy-dense foods. The first items dropped are usually healthier foods – high-quality proteins, whole grains, vegetables and fruit. Low cost energy-rich starches, added sugars, and vegetable fats represent the cheapest way to fill hungry stomachs^{1,2}.

Lower diet quality separates lower-income from the more affluent Americans³. Higher-income households are more likely to buy whole grains, seafood, lean meats, low-fat milk, and fresh vegetables and fruit. Lower-income households purchase more cereals, pasta, potatoes, legumes, and fatty meats. Their vegetables and fruits are often limited to iceberg lettuce, potatoes, canned corn, bananas, and frozen orange juice.

Many nutritionists insist that all Americans have equal access to healthy fresh foods; if only they made the effort⁴. In reality, energy-dense sweets and fats are tasty, cheap, readily available, and convenient. Where kitchen facilities, cooking skills, money or time are limited or absent, they offer satisfying, if nutrient-poor, options. They also help reduce waste, spoilage, and cooking costs. Not surprisingly, they are often chosen in preference to fresh produce and other more nutrient rich foods by lower income groups⁵.

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Nutritious Diets at Low Cost

The United States Department of Agriculture (USDA) foods plans are cited to support arguments that healthy diets can be inexpensive⁶. The computer-generated Thrifty, Low-Cost, Moderate-Cost, and Liberal Food Plans were designed to illustrate how different cost nutritious diets can be obtained at different income levels.

In June 2008, the lowest cost Thrifty Food Plan was estimated at \$588.30 per month, or around \$20 per day for a reference family of four. Cost estimations of nutritious diets are significant because the TFP cost is used to set maximal benefits available from the Supplemental Nutrition Assistance Program (SNAP, previously called “food stamps”)⁷.

One way that the TFP achieves its cost objectives is by using inexpensive foods. In the 1999 TFP, most of the energy came from oil, shortening and mayonnaise, white bread, sugar, potatoes and beans. The only fresh fruit choices were low cost oranges, apples, bananas, and grapes. Although vegetable servings technically met the guidelines, the amounts of fresh tomatoes or lettuce in the TFP were very small.

Another way that the TFP achieves its low cost objectives is by ignoring the current eating habits of the American population. In its 2006 revision, the TFP was dramatically different from the observed patterns of consumption. TFP goals could only be achieved by pushing the consumption of rarely eaten foods to unacceptable amounts (e.g. legumes or whole grain pasta), sometimes exceeding current amounts by a factor of 20 or more. By contrast, the consumption of other food groups (e.g. citrus juices and whole milk) would need to drop to zero. There is nothing in the food marketing or nutrition education literature to indicate that such massive shifts from existing eating habits are even feasible. Keeping the Thrifty Food Plan closer to the actual eating habits of the population would, of course, entail higher costs.

Time poverty presents an additional problem. Decades ago, many American households included at least one person with sufficient time to shop for and prepare meals “from scratch.” The 2006 TFP recognized that work force demographic shifts necessitated more convenience foods, yet after modifications, the estimated time required to purchase, prepare and cook the TFP foods is still higher than the American norm.

In other words, low cost nutritious diets can be created, in principle, by the TFP framework. However, such diets may be low in palatability and variety, may require dramatic shifts in eating habits and may be time intensive to prepare. Working mothers can follow TFP guidelines and prepare low-cost nutritious foods, or can have a paying job outside the home, but may find it difficult to do both.

SNAP benefits are supposed to provide low-income families with sufficient food purchasing power to obtain a nutritious diet. However, good nutrition does go beyond mere survival and should include taste, convenience, and variety and be consistent with societal norms. Some suggestions on how low income families can improve their diets have lost track of these basic facts. Low-income families face a bad situation, which is worsening in the present economic climate⁸.

The “Dinner Plate of Healthy Foods”

A November 2008 article in the ERS/USDA publication⁴ asserted that SNAP provided low-income households with ample purchasing power to afford healthy diets. A prominent photograph, composed mostly of steamed and fresh vegetables, was titled “a dinner plate of healthy foods”. The suggestion was that low-income food assistance recipients move them to the “center of their plates and budgets”.

We purchased the pictured foods from a local chain supermarket in the smallest quantities necessary (see Table 1). Purchased were 3 Brussels sprouts, 12 green beans, 3 olives, 1 mushroom, 1 red pepper and 1 head of romaine lettuce, exactly as pictured by the ERS. Purchases of grated carrots, pasta, and grapes were limited by the smallest purchasable size. Produce preparation included washing, trimming, coring, slicing, boiling and draining, while the noodles were boiled. Estimated preparation time totaled 40 minutes. Reported consumption frequencies were obtained from the 1999 – 2002 National Health and Nutrition Examination Survey (NHANES) database. Nutrient composition analysis was performed using the Food Processor for Windows program (version 8.5.0, ESHA Research, Salem, OR).

The minimum purchase price for one person was \$9.28. As some foods had to be purchased in minimum quantities, the per person cost of the pictured dinner dropped to \$4.17 per person for a reference family of four. That amount exceeded 80% of that family's maximal SNAP benefits for one day, with the foods selected falling far short of a full day's total nutrient needs.

The healthy dinner plate weighed 458g (1 lb), yet supplied just 335 kcal, mostly from carbohydrates. Protein content was inadequate (13g), while percent energy from fat was 13% (5g). Overall energy density was 0.7 kcal/g, less than half that of the typical American diet without beverages (1.6 kcal/g). The pictured low-income "dinner" was nutritionally unbalanced and based on expensive and rarely eaten foods. Of the foods shown, only shredded carrots, grapes and romaine lettuce were consumed with any regularity by NHANES study adults. Reported consumption of whole wheat pasta or Brussels sprouts in NHANES was close to zero.

What are the Affordable Nutrient Rich Foods?

More realistic dietary guidelines would do well to emphasize nutrient-rich foods that are affordable, appealing and that are part of the mainstream American diet. This may require two novel research tools. First, nutrient profiling techniques can help calculate nutrients per calorie and nutrients per unit cost for individual foods or food groups⁹. Second, diet optimization techniques, similar to the TFP framework, but more sensitive to consumption constraints, can help translate dietary guidelines into more concrete food plans for consumers at every income level¹⁰.

Nutrient profiling involves systematically ranking or classifying foods on the basis of nutrient content, through calculation of key nutrient content, relative to dietary energy. Nutrient-rich foods provide relatively more nutrients than calories. For example, the Nutrient Rich Foods (NRF) index is based on 9 nutrients to encourage: protein, fiber, vitamin A, C and E, calcium, iron, potassium, and magnesium, and on 3 nutrients to limit: saturated fat, added sugar and sodium, with all amounts calculated per 100 kcal of food or per serving size.

Combining nutrient profiling with food price analyses allows researchers to directly evaluate nutrients per calorie and nutrients per unit cost, allowing "energy cost" comparisons across foods and food groups. Preliminary data already suggest that milk, yogurt, eggs, beans, potatoes, carrots, cabbage, citrus juices and fortified cereals offer high nutrient density at low cost, as do many canned and frozen foods. Dietary guidelines ought to combine sound nutritional advice with analysis of cost.

Diet optimization models can be used to translate dietary recommendations into food plans at different levels of nutritional quality and cost. Such models should minimize the difference between the observed and the recommended diets by setting consumption limits based on the eating habits of the referent population. To prevent the food plan from including excessive amounts of any one food group, lower and upper bounds for consumption are included in the model. Food plans based on dietary guidelines can then be designed for different population

subgroups. For those with good dietary habits, the recommended dietary changes may be small and achievable. On the other hand, those with poor baseline diets may find it difficult to achieve the recommended goals. The development of dietary guidelines ought to be accompanied by a feasibility analysis.

Toward 2010 Dietary Guidelines for *All* Americans

Reducing food expenditures below a certain amount virtually ensures an energy-dense diet with low nutrient content. With affordable good nutrition the theme of the day, identifying affordable nutrient rich foods becomes a matter of prime concern to dietary guidelines.

Affordable good nutrition requires reconciling nutrient density, nutrient cost, and current consumption patterns or social norms. These diverse factors must be considered to develop dietary guidelines truly applicable to all segments of American society. The current economic situation demands that the 2010 Dietary Guidelines Advisory Committee take food prices and the food choices made by real people into account.

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USDA/ERS "dinner plate of healthy food": ingredients, weights, preparation time, prices, and frequency of consumption

Table 1

Food	Net purchase weight (g)	Purchase price	Tot Prep Time (min)	Portion shown (g)	Kcal per portion shown	Cost per portion shown	Total price per 4 servings	Cost per 100 kcal	Frequency of Consumption *
Romaine lettuce	440	\$1.79	4	33	6	\$0.13	\$1.79	\$2.39	312
Brussels sprouts	78	\$0.54	8	76	27	\$0.51	\$2.16	\$1.87	5
Green beans, whole	77	\$0.50	8	70	25	\$0.47	\$2.00	\$1.91	71
Mushroom, Crimini	28	\$0.36	2	9	2	\$0.12	\$0.72	\$5.84	100
Carrots, shredded	233	\$1.79	1	30	12	\$0.23	\$1.79	\$1.87	1265
Whole wheat thin spaghetti, boxed	371	\$1.50	8	132	164	\$0.18	\$1.50	\$0.11	2
Red pepper	200	\$1.50	6	48	12	\$0.36	\$3.00	\$2.88	69
Grapes, green seedless***	120	\$1.03	2	74	51	\$0.65	\$2.65	\$1.27	823
Olives	13	\$0.27	1	13	37	\$0.27	\$1.08	\$0.74	138
Totals		\$9.28	40	485	335	\$2.92	\$16.69		

* Reported frequency of consumption, listed in NHANES, as purchased and consumed, without added salt or fat

** Grapes from Metropolitan Market, where they could be purchased in small quantities