

Healthier foods cost more

It is just as important for readers to be aware that the graphs presented by Drewnowski et al.¹⁻³ were always carefully annotated to show the exact position of grains, fats, and sweets relative to lean meats, vegetables, and fruit. Foods and food groups were always clearly identified and, in some cases, energy cost data for different food groups were presented on separate figure panels.^{2,3} To

suggest that Drewnowski et al. ever presented undifferentiated scatterplots of the kind generated by Burns et al.⁴ could not be further from the truth.

That energy-dense grains, fats, and sweets cost less per calorie than do fresh vegetables and fruit is not some “autocorrelation” artifact as Burns et al.⁴ would have us believe. The same energy cost data by food

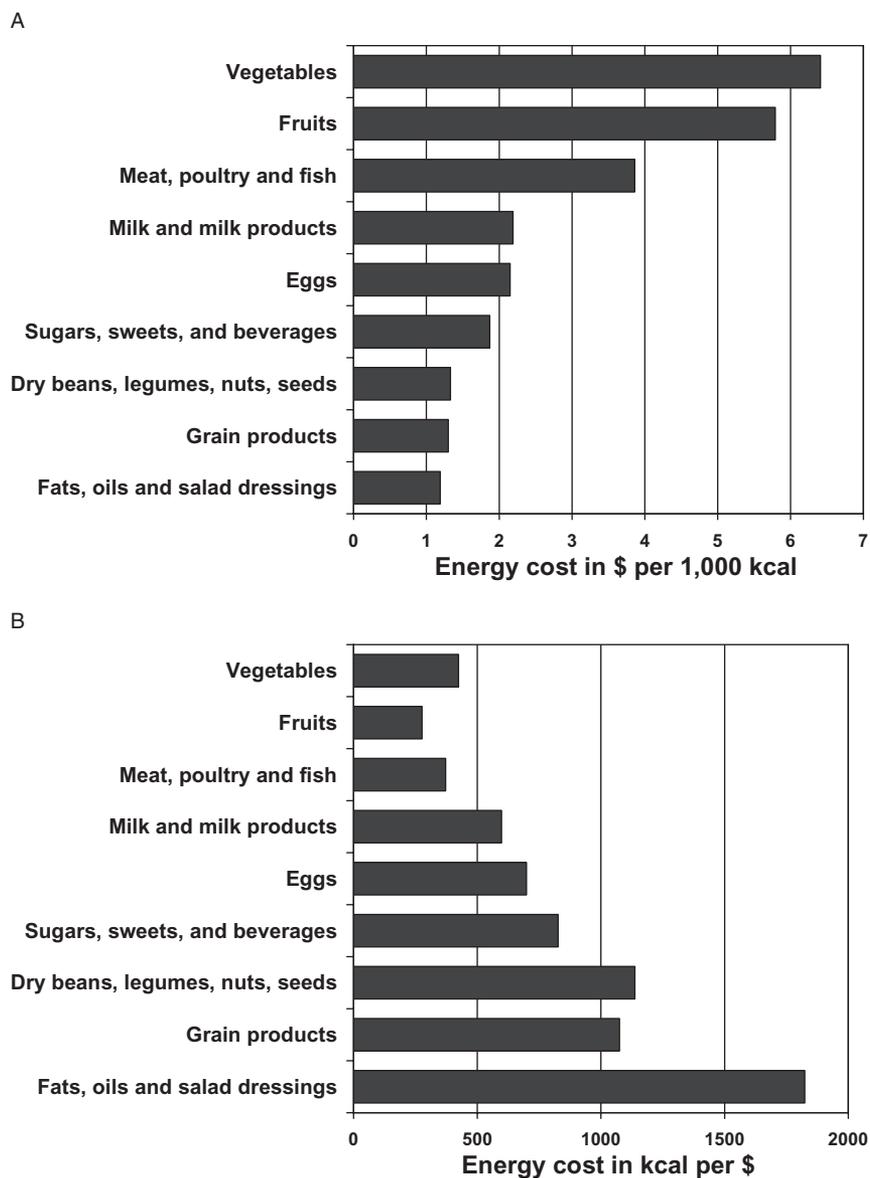


Figure 1 Horizontal bar graphs showing energy costs, expressed as dollars per 1000 kcal (A) and kcal per dollar (B) for 550 foods in 9 major food groups. Data from FNDDS 1.0 and CNPP food price database.

group can be presented in unidimensional horizontal bar graphs.

Figure 1 shows, for each food group, the cost per 1,000 kcal (Panel A) and calories per dollar (Panel B). The analyses were based on the USDA Food and Nutrient Database for Dietary Studies 1.0 (FNDDS 1.0) merged with the USDA Center for Nutrition Policy and Promotion national food prices database.^{5,6} Only foods with frequency of consumption >30 in the National Health and Nutrition Examination Survey 2001–2002 were included. Removed were infant formulas, baby foods, mixed dishes, condiments, diet beverages, and alcohol for a remaining total of 550 foods.

On the average, fruits ($n = 47$) provided 277 kcal per dollar, whereas vegetables ($n = 92$) provided 424 per dollar. By contrast, grains ($n = 174$) provided 1,075 kcal per dollar, whereas fats ($n = 27$) provided a high of 1,825 kcal per dollar. Clearly, calories from low-energy-density vegetables and fruits with a high water content were more expensive than calories from other food groups. Water provides weight but no energy and no nutrients. We have always stressed that dry grains, fats, and sweets had low water content and were therefore more energy-dense than were vegetables and fruit.^{1–3}

Burns et al. err further in crediting me with the hypothesis that cost per calorie is an important factor in food purchases. It was Wilbur O. Atwater who noted, in 1894, that in comparing the cost of different foods, people were apt to judge them, wrongly, by the “prices per pound, quart, or bushel” without much regard to the amounts or kinds of nutrients they actually contained.⁷ His solution was to determine the relative amounts of protein, fat, carbohydrate, and calories that could be obtained from different foods for a fixed monetary cost. Atwater’s 1894 article in the *Farmers’ Bulletin* used a horizontal bar graph (identical to the one in Figure 1B) to show the amounts of calories and macronutrients that could be obtained from different foods for 25 cents. The lowest-cost calories came from grains, sugar, salt pork, potatoes, and beans.⁷

The concept of value of money, mentioned by Burns, can also be traced back at least 100 years. In Atwater’s view, the cheapest food was that which supplied the most nutrients at least cost. By contrast, the most “economical” food was that which was cheapest and at the same time best adapted to the needs, wants, and resources of the consumer.⁷ Some of those socio-cultural factors were addressed more fully in our published articles on obesity and poverty,⁸ diet quality and social class,⁹ and the monetary cost of following social norms.¹⁰

Burns et al. suggest that socio-cultural factors, education, and cultural norms, rather than money, drive food purchases of poor people, while discounting the need to satisfy hunger at low cost. Permit me to quote another 19th century figure, Herman Melville: “Of all the preposterous assumptions of humanity over humanity, nothing exceeds most of the criticisms made on the habits of the poor by the well-housed, well-warmed, and well-fed.”

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