

Each underlined sentence has comment attached.

The cost of healthy diets: What guidelines for the working poor?

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Highest rates of obesity occur among population groups with highest poverty rates and the least education. This may have to do with limited economic resources, food prices, and diet costs. Diets composed of refined grains, added sugars, and fats are far more affordable than are diets based on lean meats, fish, fresh vegetables, and fruit. The inverse relationship between energy density (kcal/100g) and energy cost (\$/1000kcal) is such that energy-dense grains, sugars and fats provide the most energy – but least nutrients – per unit cost. **Because such foods are affordable, accessible, and enjoyable they are preferentially selected by the lower-income consumer. In contrast, low-energy-density diets of higher quality are generally associated with greater affluence, higher education, and higher incomes. If the recommended healthful diets cost more, then households of limited means may not have the economic resources to select a healthy diet on a regular basis.** The economic dilemma raises the issue whether the prevention of obesity among children and adults can be addressed through motivation, improved education or appeals to personal accountability? Or are the causes of the obesity epidemic to be found among the current economic policies, employment practices, imports, tariffs and trade?

Introduction

Rising rates of obesity in the U.S. and other industrialized societies have been linked to the growing consumption of fast foods, snacks, caloric beverages, sweets and desserts.⁽¹⁾ Studies have examined the contribution to the obesity epidemic of added sugars, added fats, increased portion sizes, nutrient composition of foods away from home, and the energy density of the diet.^(2, 3) Public health policies for the prevention of obesity increasingly call

for taxes and levies on fats and sweets, both to discourage their consumption and to help promote healthier food choices.⁽¹⁾ The new emphasis on the “obesogenic” food environment has led to legislative and policy measures to improve nutrition in workplaces, neighborhoods, and in schools. In addition, various segments of the food, grocery and restaurant business have found themselves exposed to lawsuits for their alleged role in causing the obesity epidemic.

Researchers have drawn attention to predatory marketing practices, placement of fast food outlets in low-income neighborhoods, and inadequate access to healthy foods in the inner city. All these factors place minorities and the poor at a disadvantage when it comes to the adoption of healthy eating habits. The food industry has responded that providing a wide range of low-cost foods and services is a clear benefit to the public. The main argument pits personal accountability against societal and economic pressures. **On one hand, consumers have a degree of personal responsibility for their eating habits and are free to choose among the available foods. On the other hand, individuals are sometimes unable to resist powerful social and economic forces that are largely beyond their control.**

Americans spend the lowest proportion of disposable income on food (~12%) and have the lowest-cost food supply in the world.⁽⁴⁾ Until recently, no-one has seriously questioned whether a low-cost food supply brought anything but benefits to the U.S. Similarly, the freedom of choice has never been questioned. Official recommendations and guidelines, including the 2005 Dietary Guidelines for Americans, exhort consumers to “choose” healthful diets as opposed to unhealthy ones. However, the adoption of healthier diets is not necessarily a matter of free choice – economic factors are important as well.

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Poverty and obesity are linked

Obesity is defined as body mass index (BMI=kg/m²) greater than 30, whereas overweight is defined as BMI greater than 25. **The rates of obesity and type 2 diabetes in the U.S. follow a socioeconomic gradient, with highest rates observed among racial/ethnic minorities and the poor.⁽⁵⁾ Among women, higher obesity rates tend to be associated with low incomes and low education.** The association of obesity with low SES has been less consistent among men. Although obesity rates have continued to increase steadily in both sexes, all ages, all races, and at all educational levels, highest rates occur among the most disadvantaged groups. Obesity and food insecurity, defined as “limited or uncertain availability of nutritionally acceptable or safe foods”, also appear to be linked. In particular, female recipients of USDA food assistance were more likely to be obese. Given that low-income families are the chief beneficiaries of food assistance programs, links between food insecurity and obesity have implications for food and nutrition policies.

Energy dense foods cost less

Developments in agriculture and food technology have made **energy-dense foods accessible to the consumer at a very low cost.** Figure 1 shows the inverse relationship between energy density (kcal/100g) of foods and their energy cost (cents/10MJ). Food prices were provided by government and marketing sources in France.^(6, 7, 8) Energy cost of vegetables oils and sugars was less than 10 Euro-cents per 1000 kcal, whereas that of fresh produce was 10 times as much. Similar trends had been observed using US prices. **In the US, energy cost of soft drinks was, on average, 30 cents/MJ (875 kcal/\$), whereas that of orange juice from concentrate was 143 cents/MJ (170kcal/\$).** Fats and oils, sugar, refined grains, potatoes, and beans provided dietary energy at minimum cost. As indicated by the logarithmic scale, the differential in energy costs between lard and lettuce was several *thousand* percent.

Dry foods with a stable shelf life are generally less costly (per MJ) than perishable meats or fresh produce with a high water content. As a rule, potato chips, chocolate, and locally-bottled soft drinks are less expensive – per calorie - than are lean meats, fish, fresh vegetables and fruit. Selecting refined

grains, added sugars, and vegetable fats may represent a deliberate strategy to save money.⁽⁷⁾ Lower food costs may lead to more energy-dense diets, and total energy intakes may actually increase.^(2, 3) Paradoxically, it is possible to spend less and eat more, provided that the extra energy comes in the form of added sugar and added fat.⁽⁵⁾ The association between poverty and obesity may be mediated, in part, by the low cost and high palatability of energy-dense foods.⁽⁵⁾

Obesity studies have stressed the sugar and fat content of snacks, fast foods, beverages, and confectionery. Epidemiologic studies have linked the consumption of fats and sweets, potatoes, and refined grains with higher glycemic load and higher risk of obesity and type 2 diabetes. **Interestingly, foods implicated in promoting obesity were those that provided dietary energy at a very low cost.** The same ingredients, when priced higher, have been immune from complaint. A case in point, sweetened soft drinks – principal ingredient sugar – are routinely associated with weight gain, whereas higher-priced sugar generally is not.

The standard dietary advice is to replace fats and sweets with more fruit, vegetables, whole grains, poultry and fish.⁽⁹⁾ However, the more healthful foods are also more expensive and beyond the reach of many. **Some low-income families limit their food budget to \$100 for 4 people per week, or less than 4 dollars per person per day. The only foods that can be obtained for this amount of money will be high in refined grains, added sugars and added fats.**

Do healthier diets cost more?

Diet quality in the US is very much a function of socioeconomic status. People who are older, wealthier and better educated are both thinner and have better diets than do the poor. This is not restricted to the US: similar associations between higher incomes and higher quality diets were also found in Canada, France, UK and other countries of the European Union. The impact of SES variables on diet quality has normally been ascribed to a higher educational level or greater awareness of health issues among higher-income groups. Another possibility is that food choices are driven by the economic realities of life.

According to Engel’s Law, the share of income spent on food decreases as incomes rise. Because

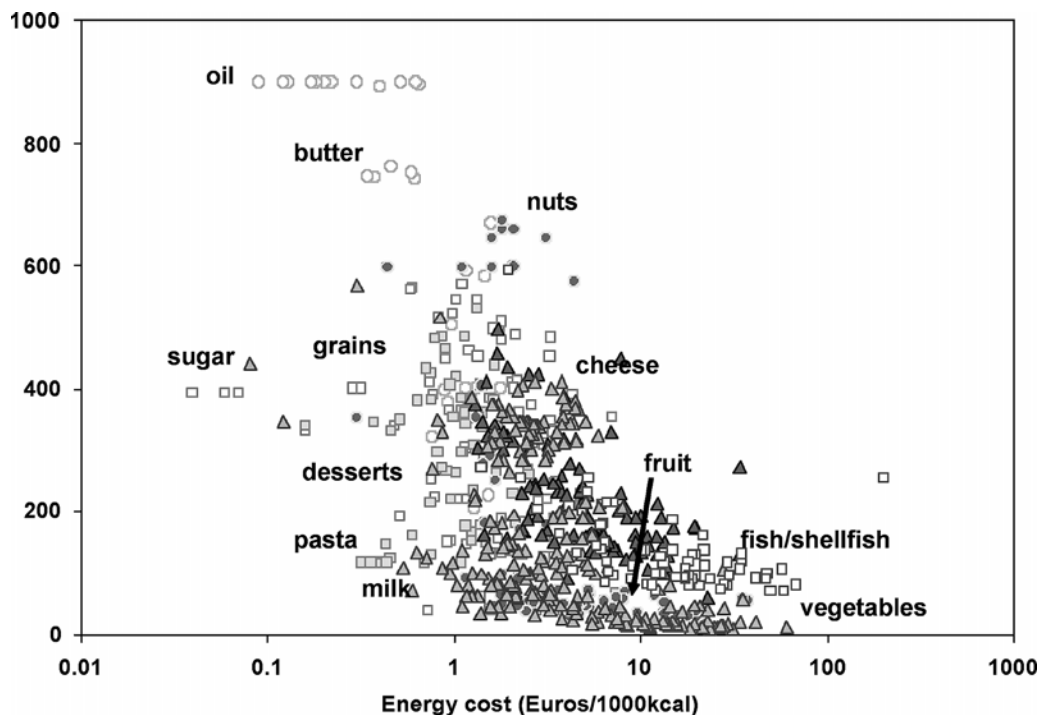


Figure 1. Relationship between energy density of selected foods (kcal/100g) and energy costs (€/MJ). Food prices from government and marketing sources in France, 1999. Note that the energy cost differential between added sugars and fats and fresh vegetables and fruit can be several thousand percent, as indicated by the logarithmic scale.

incomes have increased faster than food costs, average food expenditures in the US have dropped to only 10.7% of incomes in 1997. In 1997, Americans spent 9.4% of disposable income on foods consumed at home and 4.1% on foods consumed away from home. The drop in food spending was disproportionately greater than the drop in spending on other goods. Despite spending less, low income families devoted a higher proportion of disposable income to food. By 1999, mean total expenditures on foods and beverages (including alcohol) were estimated at just under \$8.00 per person per day. Assuming a daily ration of 10.5 MJ (2,500 kcal), the estimated mean energy cost of the total diet was 76.9 cents/MJ. In Western societies, lower energy costs are associated with higher energy intakes.

Obesity: an economic hypothesis

Food choices in obesity have been explained in terms of biology, physiology, and behavior. The biological explanation has been that “cravings” for fats and

sweets are driven by central metabolic events, serotonin imbalance, altered leptin levels, or by the endogenous opiate peptide system. Physiological explanations have invoked insulin resistance and the glycemic index of foods. Psychological explanations have addressed inadequate nutrition knowledge, an addictive personality, stress, or seeking comfort in high-fat foods. Environmental approaches have blamed the wide availability of snacks, fast foods, and soft drinks, “supersized” portions, and the presence of vending machines in schools.

Fewer studies have made the link between low-cost foods and the obesity epidemic. One paper, by the National Bureau for Economic Research, found that obesity was linked to lower food prices in general; the present argument is that only grains, added sugars and added fats has dropped, whereas the price of nutrient dense foods has increased. Whereas “unhealthy” diets cost less, the recommended healthier diets are likely to cost more. As a result, the diet of industrialized nations is becoming increasingly energy rich but nutrient poor.⁽¹⁰⁾

Given economic constraints, especially among lower income groups, not all consumers have the same degree of choice when it comes to purchasing healthful fresh produce, fruit, lean meats and fish. For many, the choice has been removed long ago by economic and employment policies. There are good economic reasons why poverty and obesity are so closely linked.



References

1. World Health Organization and Food and Agriculture Organization. Report of the joint WHO/FAO expert consultation on diet, nutrition and the prevention of chronic diseases. Geneva, Switzerland: World Health Organization, 2002. [WHO technical report series 916.]
2. Drewnowski A, Darmon N. Food choices and diet costs: an economic analysis. *J Nutr* 2005;135:900-904.
3. Drewnowski A, Darmon N. The economics of obesity: dietary energy density and energy cost. *Am J Clin Nutr* 2005;82(1 Supp) 265S-273S.
4. Drewnowski A. Fat and sugar: an economic analysis. *J Nutr* 2003;133:838S-40S.
5. Drewnowski A, Specter SE. Poverty and obesity: The role of energy density and energy costs. *American Journal of Clinical Nutrition* 2004;79: 6-16.
6. Andrieu E, Darmon N, Drewnowski A. Low cost diets: more energy, fewer nutrients. *Eur J Clin Nutr* 2006;60:434-6.
7. Darmon N, Ferguson EL, Briand A. A cost constraint alone has adverse effects on food selection and nutrient density: an analysis of human diets by linear programming. *J Nutr* 2002;132:3764-71.
8. Darmon N, Darmon M, Maillot M, Drewnowski A. A nutrient density standard for vegetables and fruits: nutrients per calorie and nutrients per unit cost. *J Am Dietet Assoc*, 2005; 105(12):1881-1887.
9. Rolls BJ, Drewnowski A, Ledikwe JH. Changing the energy density of the diet as a strategy for weight management. *J Am Dietet Assoc* 2005; 105(5Suppl 1):S98-103.
10. Drewnowski A. Concept of a nutritious food: toward a nutrient density score. *Am J Clin Nutr* 2005;82(4) 721-2.

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