



COMMENTARY

Diets high in fruit and vegetables are more expensive than diets high in fats and sugars [☆]

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KEYWORDS

Fruit;
Vegetable;
Sugar;
Fat;
Diet;
Cost

Question: Does a diet high in fruit and vegetables cost more than a diet high in fats and sugars?

Study design: Cross-sectional study with cost analysis.

Main results: A high dietary intake of sucrose, total fat, grains and fats and sweets is cheaper than a high dietary intake of fruit, vegetables and meat (see results table). Daily dietary cost was higher for a diet high in fats and sweets, compared with a diet low in fats and sweets. However, the cost per unit energy was higher with a diet low in fat and sweet intake. By contrast, both daily dietary cost and cost per unit energy were higher with a diet high in fruit and vegetable intake compared with a diet low in fruit and vegetable intake (see results table). Every extra 100 g of fats and sweets eaten decreased diet costs by 0.05 to 0.4 Euros, whereas every extra 100 g of fruit and vegetables eaten increased diet costs by 0.18 to 0.29 Euros.

Authors' conclusions: Fats and sweets provide dietary energy at a low cost, while fruit and vegetables provide dietary energy at a much higher cost. Diets high in fats and sugars, which are bad for our health, are more affordable than diets high in fruit and vegetables, which are good for our health. This has significant health implications, particularly for people from low socioeconomic areas.

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Further details

Setting

General population, France; from 1988 to 1999.

Participants

837 people over the age of 18 (men: 361; women: 476; average age: 43 years).

[☆] *Abstracted from:* Drewnowski A, Darmon N, Briend A. Replacing fats and sweets with vegetables and fruits—A question of cost. *Am J Pub Health* 2004; 94: 1555–1559.

Results table

Food categories	Daily dietary cost (Euros)		Cost per unit energy (Euros/MJ)	
	Highest intake quintile	Lowest intake quintile	Highest intake quintile	Lowest intake quintile
Fats and sweets	5.9	4.4	5.2	7.6
Fruit and vegetables	6.0	4.3	6.7	5.6

Analysis

Food intake (g/day) was recorded during a dietary history interview by a trained dietician. Food costs were calculated from 57 foods recorded in the Val-de-Marne nutrient database. Alcohol, tea, coffee, water, and unusual foods (eaten by <5% of the population) were excluded. The five main food groups were grains, fruit and vegetables, meats, dairy products and fats and sweets. Total diet cost was calculated by multiplying the unit cost for each food by the amount of that food eaten and adding together the cost of all the foods eaten. The association between diet cost and diet composition was determined by multivariate regression analysis, adjusted for age and gender. One-way analysis of variance was used to determine the association between diet cost and the different food groups.

Main outcomes

Dietary costs.

Notes

Authors note that there are a number of limitations to the study. These include: the estimation of diet costs from mean national food prices; using specific foods to represent each dietary category; exclusion of children and adolescents from the study; and the lack of detailed socioeconomic information, which is known to influence diet.

Sources of funding: Institut National pour la Science et la Recherche Medicale, Institut National de la Recherche Agronomique, Institute Scientifique et Technique de la Nutrition et de l'Alimentation and Conservatoire National des Arts et Metiers, France.

Abstract provided by Bazian Ltd, London

Commentary

The authors estimate the cost of freely chosen diets in one community in France and examine the relationships among diet quality, dietary energy density, and estimated diet costs. They conclude that 'prudent' diets are more expensive than less prudent ones and that policy should focus on improving the affordability of such diets. This conclusion and policy recommendation appear eminently reasonable. Closer examination of the study reveals, however, that the findings are misleading and may serve to muddy the policy discussion.

The primary problem with the analysis is the authors' use of calories as the common denominator. All of their diet comparisons are in terms of the 'cost-per-calorie' of different foods. There is nothing surprising in the observation that it costs more to eat a 2000-calorie diet composed of fruits and vegetables than one composed of high-fat, high-sugar foods. Simple plant biology, not economics, supplies most of the evidence: it takes 23 heads of endive (11,799 g) compared with only slightly more than one cup of cooking oil (226 g) to comprise 2000 calories. Even if endive and oil cost the same amount per gram, the sheer volume of endive necessary to consume 2000 calories tilts the cost-per-calorie comparison in favour of the cooking oil. (On a cost-per-fibre basis, or a cost-per-vitamin A, or vitamin C or calcium or iron basis, endive is definitely the better buy since cooking oil does not contain any of these nutrients!)

Cost-per-calorie comparisons do not shed light on the way consumers make their food choices, particularly in the United States, where most individuals, including many low-income individuals, struggle to reduce calorie consumption. In 2001–2002, over 60% of low-income adults were overweight or obese, and over 40% were striving to lose or at least maintain their weight.¹

The cost-per-calorie concept makes it impossible to explain why any consumer – particularly a low-income consumer – would buy diet sodas, which have much higher costs-per-calorie than regular drinks. Yet, in the United States, 42% of households with annual incomes below \$5000 purchased soft drinks for in-home consumption in 1999. It does not explain why consumers willingly pay a higher price for foods that have been nutritionally 'improved', particularly when they have fewer calories than traditional versions (and therefore a higher cost-per-calorie).² Nor does it explain why consumers would eat more calories than necessary, when they could reduce calories as well as food costs simply by eating less.

The real question for policymakers is whether low-income consumers can afford healthful diets – but a cost-per-calorie comparison does not provide the answer. Evidence on actual prices and food budgets suggests that most Americans could afford a healthful diet, although most choose not to. For example, a recent study showed that, in the United States, consumers could purchase seven servings of different fruits and vegetables for \$1 or less in 1999.³ This represented 12% of total food expenditures on food at home (14% for low-income households), leaving the remaining 88% (86%) available for other food purchases.

Raynor et al.⁴ actually looked at food costs for families of obese children before and after changing to a healthier diet, and found that food costs for the healthier diet increased slightly in the beginning, while consumers were in 'transition'. However, by the end of 12 months, daily food costs of the healthier diets were lower than the original food costs. Interestingly, the lower costs were mostly due to reductions in high-calorie or low-nutrient density foods – that is, foods with low cost-per-calorie.

If cost-per-calorie comparisons were useful measures of barriers to healthy eating, we would expect higher income individuals (for whom food costs should not be a barrier) to have more healthful diets than low income households. Although diet quality does increase with income levels, the improvement is slight. Basiotis et al.⁵ found that in 1999–2000, higher income households had a Healthy Eating Index of 65 (out of 100), compared with 61.7 for households below the poverty line. Blisard et al.⁶ found that low-income households do not increase their spending on fruits and vegetables in response to an increase in income.

The reality is that although cost is an important consideration in food choices, it is only one of many. A wide range of other factors, such as palatability, convenience, education, cooking ability, ethnicity, and habit also influence food choices. To most consumers, cost-per-calorie is probably not an important factor. Nor is it useful to policy makers and nutrition educators in explaining why consumers choose the foods they do.

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