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Could a Calorie Tax or Cuts in Farm Subsidies Reduce Obesity?

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Every day—whether in the supermarket, in restaurants, in the workplace, or preparing meals at home—each U.S. adult makes hundreds of decisions about what foods to buy, what to eat, and when. From those myriad decisions has come an unwelcome, progressive rise in obesity and the social costs of obesity-related illness. In less than thirty years, the prevalence of obese Americans has more than doubled, and now more than one-third of adult Americans are obese.

Prominent journalists and academics tell policymakers that farm policies, by making food commodities more abundant and cheaper, have contributed to the problem and that getting rid of farm subsidies will help solve it. Others propose taxes on fattening foods and beverages or subsidies for "healthy" foods. The broader idea behind these prescriptions is that policy-induced changes in prices will cause consumers to make different food choices and that this will be sufficient to help stem the rising tide of obesity.

Would eliminating farm subsidies or introducing food taxes really help? If so, which subsidies should be eliminated and which foods should be taxed and at what rate(s)? Would any resulting benefits from reduced obesity be more valuable than the costs associated with the policy?

To address these questions, we built a simulation model that we can use to predict changes in quantities and prices of food and beverage products and farm commodities as a result of specific policy shifts. The model includes all the links in the supply chain from farm-to-food-to-final-consumer,

and encompasses all foods (including food consumed away from home).

In the model, a total of 11 farm commodities are used, along with composite "marketing" input (i.e., materials and labor used to manufacture and retail, transport and advertise food products), to produce a total of 10 retail food and beverage products.

It's a calibrated simulation model, structured so that we can use the results to derive monetary measures of the consequences of economic changes, such as the introduction of taxes or subsidies that distort consumption choices. We can therefore compare "deadweight losses" (economic losses from distortions in food production and consumption) induced by the policy with the offsetting benefits from reducing obesity-related health-care costs.

We use this model to assess the implications of a range of hypothetical policies, including simulations to represent either the elimination of farm subsidies, the introduction of subsidies on fruits and vegetables, or the introduction of new taxes on all foods—either at a uniform percentage tax rate or at differential rates based on their content of particular ingredients or nutrients (i.e., fat, sugar, or calories).

Rates of taxation were chosen to make the alternative tax policies closely comparable to a $5/kg tax on the fat content of food. The resulting estimated changes in food consumption were used to compute the implied changes in caloric consumption, from which we inferred a change in steady-state body weight (per capita). Using the estimated change in body weight, we were able to infer changes in public health-care costs and deadweight losses.

We found that eliminating farm subsidies—including direct subsidies on grains and indirect subsidies from trade barriers on dairy, sugar, and fruit and vegetable commodities—would have very limited impact on calorie consumption, and hence, obesity.

Food taxes might be more effective, as indicated by the key simulation results, summarized in Table 1. The first column of Table 1 shows the deadweight losses that accrue from a policy change, the second column shows the offsetting benefits from reducing obesity-related health-care costs, and the third column is the difference between the first two columns, or the net social benefits.

Among the tax policies considered, the most efficient policy would be a tax on food based on its caloric content. That policy would yield a benefit to national welfare of $1.74 per pound of weight lost (once the implied changes in public health care costs are taken into account). A sugar tax, uniform food tax, or a fat tax that would have the same effect on body weight would also yield a net social benefit, although less than the calorie tax.

Table 1. Net Benefits and Social Costs of Selected Policies

Tax rate	Annual change in social welfare excluding changes in public health-care costs	Annual change in public health-care costs	Annual change in social welfare Including changes in public health-care costs	Total change in steady-state weight for US adults	Annual benefit/pound decrease in steady-state body weight
	millions of dollars per year			*pounds (millions)*	*$/lb/yr*
$0.165 per thousand calories	-1,185	-3,462	2,277	-1,302	1.74
$2.688 per kilogram of sugar	-1,210	-3,413	2,203	-1,283	1.71
5.03% uniform food tax at	-1,491	-3,486	1,995	-1,310	1.53
$5.00 per kilogram of fat	-1,826	-3,520	1,694	-1,323	1.28

Note: Drawn from Table 12b of Okrent and Alston (2012).

In contrast to the tax policies, the fruit and vegetable subsidies would be very inefficient or counterproductive (a subsidy on fruit and vegetables at the farm is simulated to increase caloric consumption and obesity).

Ultimately, if the goal of policymakers is simply to reduce obesity in the United States, among the policies considered here, the most efficient policy would be to tax calories. If other objectives also matter, a more complex policy may be called for. ■

FOR FURTHER READING

Okrent, A.M., and J.M. Alston. 2012. "The Effects of Farm Commodity and Retail Food Policies on Obesity and Economic Welfare in the United States." *American Journal of Agricultural Economics* 94(1): 611–646.

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