

## Should Junk Food Be Taxed?

Duffey KJ, Gordon-Larsen P, Shikany JM, et al. Food price and diet and health outcomes: 20 years of the CARDIA Study. *Arch Intern Med* 2010;170:420–6.

### Study Overview

**Objective.** To examine whether there is an association between food price and overall energy intake, weight, and insulin resistance.

**Design.** 20-year longitudinal study.

**Setting and participants.** The data on food consumption came from the Coronary Artery Risk Development in Young Adults (CARDIA) study. There were 5115 participants aged 18 to 30 at baseline. The respondents lived in 4 different cities at baseline, but continued to be followed if they moved out of these cities. Data were collected at years 0, 7, and 20. Food price data came from the Council for Community and Economic Research (C2ER). All prices are in 2006 dollars. The price data were linked to the CARDIA responses by date of response and geographical location. The study looked specifically at 4 foods: soda, whole milk, pizza (eaten away from home), and hamburgers (eaten away from home).

**Main outcome measures.** (1) Mean change in daily energy intake, (2) mean change in body weight, and (3) mean change in insulin resistance score.

**Main results.** The real price of soda and pizza decreased by 48% and 20% respectively over the 20-year period. A 10% increase in the price of soda was associated with a 7% decrease in the energy intake from soda. Similarly, a 10% increase in the price of pizza was associated with a 11.5% decrease in

the energy intake from pizza. A \$1 increase in soda price was associated with 124-kcal lower total daily energy intake, 1.05-kg lower weight, and lower insulin resistance score. Similar trends were observed for pizza.

**Conclusion.** The findings suggest that higher prices for soda and pizza were associated with lower total energy intake, lower weight gain, and lower insulin resistance. Policies that raise the price of soda or pizza may be effective in reducing long-term weight gain or insulin resistance.

### Commentary

The rising costs of health care have many underlying causes, but one that has garnered substantial attention is the rising obesity epidemic and its impact on rates of diabetes, hypertension, and heart disease. While the increase in American's girth is due to several unique factors, policy makers have postulated that falling food prices (especially among foods that are high in calories and fat) may underlie some of the increases in food consumption. The evidence behind this notion has been relatively weak. Further, as policy makers contemplate strategies to reduce or slow the obesity epidemic, they are increasingly focused on the taxation of high energy sodas and other similar foods to reduce consumption. Data on whether such a strategy might be effective would be very helpful.

The study by Duffey and colleagues begins to help fill in the evidence gap. In a large cohort of young Americans followed for 20 years, they examine whether local prices of certain foods (especially soda and pizza) were associated

### Outcomes Research in Review SECTION EDITORS

Ashish K. Jha, MD, MPH  
Brigham and Women's Hospital  
Boston, MA

Ula Hwang, MD, MPH  
Mount Sinai School of Medicine  
New York, NY

Nirav R. Shah, MD, MPH  
New York University School of Medicine  
New York, NY

Mark W. Friedberg, MD, MPP  
Brigham and Women's Hospital  
Boston, MA

Yael Schenker, MD  
University of California, San Francisco  
San Francisco, CA

Asaf Bitton, MD  
Brigham and Women's Hospital  
Boston, MA

Jason P. Block, MD, MPH  
Brigham and Women's Hospital  
Boston, MA

with changes in the consumption of those food items. Several key findings from their study are worth noting. First, over the 20-year time period, real prices of sodas and pizza fell while the price of whole milk actually increased. Second, price changes were associated with a clinically significant change in consumption in exactly the direction one would expect: falling prices of soda were associated with increases in consumption, even after adjusting for differences in prices of other foods as well as patient characteristics (eg, age, gender, race). The findings offer relatively strong evidence that prices matter when it comes to consumption of these items.

There are several important limitations that are worth understanding to adequately interpret the findings of the study. First, the authors were not able to fully account for the range of “substitute” foods in their analysis (eg, skim milk and 2% milk). Some of the price data were only available for a small number of food items. Second, because this was an observational study, causal inferences are a challenge: it is hard to be sure that the changes in food prices caused changes in

consumption or changes in weight. Finally, the substitution effects are substantial—if prices of soda increased, it is not clear from these data that people would necessarily switch to a lower-calorie beverage.

### **Applications for Clinical Practice**

The study by Duffey et al adds important evidence to the literature examining whether food prices have an important impact on food consumption, calorie intake, and ultimately, obesity. These data will be seen as good news by those who favor taxing sugary drinks such as sodas. Given our federal subsidies for corn (used to make high fructose corn syrup) and sugar, a tax or reduction in subsidy might seem reasonable. However, lacking clear information on substitution effects (what people will drink if they give up soda), whether or not to take such a paternalistic approach is far from clear.

—Review by Ashish K. Jha, MD, MPH

Copyright 2009 by Turner White Communications Inc., Wayne, PA. All rights reserved.