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THEME OVERVIEW: ADDRESSING THE OBESITY CHALLENGE

Mary K. Muth

JEL Classifications: I1, Q1

Increasing rates of obesity and the associated effects on health of the U.S. population are often in the news recently. Obesity is typically defined as a body mass index (BMI) greater than 30 where BMI is calculated as weight in kilograms divided by height in meters squared. Based on self-reported height and weight data from 400,000 individuals, the Centers for Disease Control (CDC) estimates that 27% of the U.S. population is obese with the highest rates among adults 50 to 69 years of age, non-Hispanic blacks—especially women, Hispanics, and individuals with less than a high school degree. Also, rates of obesity tend to be higher in the Midwest and South. Calculated rates of obesity using measured instead of self-reported height and weight are even higher.

Obesity is associated with a number of consequences both for the individual and society. In particular, obesity is associated with reduced quality of life, social stigmatization, and discrimination. These can lead to reduced salaries for employed obese individuals and difficulty in finding employment for the unemployed. Furthermore, obesity is associated with increased risks of coronary heart disease, hypertension, stroke, Type 2 diabetes, and cancer, all of which contribute to higher medical costs borne by individuals through direct health care payments and higher insurance premiums, and by the public through higher taxes to cover Medicare and Medicaid payments.

The issue of increasing rates of obesity has been receiving attention at the highest levels in recent months. Examples of specific policy initiatives include:

- Michelle Obama's *Let's Move!* campaign (www.letsmove.gov), an initiative to combat childhood obesity by addressing food choices and physical activity;
- CDC's Communities Putting Prevention to Work, with millions of dollars of funding for community-based projects to address obesity (<http://www.cdc.gov/chronicdisease/recovery/>); and
- The 2010 Affordable Care Act, which allocates funds for demonstration projects for reducing childhood obesity and requires menu-labeling for food sold in large chain restaurants and vending machines (<http://www.nejm.org/doi/pdf/10.1056/NEJMp1008560>).

In addition, on Sept. 1, 2010, President Obama proclaimed September as National Childhood Obesity Awareness Month.

Economists have much to contribute toward measuring the economic consequences of obesity, understanding the economic and market factors that may contribute to obesity, and developing and analyzing effective solutions that rely on traditional market mechanisms as well as behavioral economics approaches. The series of papers in this theme, which lie at the intersection of fields of agricultural economics and health economics, contribute in these areas.

First, Finkelstein, Strombotne, and Popkin provide estimates of the direct costs due to increased healthcare utilization and indirect costs due to reduced work productivity associated with obesity. They also discuss what policymakers should consider in addressing obesity and whether the benefits of various current and

proposed obesity prevention efforts outweigh the costs.

Next, Ver Ploeg considers the degree to which the food environment—access to grocery stores and the variety of foods offered in grocery stores—contribute to higher rates of obesity among certain populations. The food environment is particularly relevant when considering lower income neighborhoods because it is sometimes identified as a contributor to obesity due to reduced access to healthy foods for those with limited transportation and economic means. Farm subsidies have also been cited as a potential contributor to obesity by reducing prices for basic commodities and encouraging overproduction. However, Alston, Bradley, and Okrent show the results of a policy simulation that demonstrates that the magnitude of the effects of farm subsidies on obesity is very small and that eliminating farm subsidies might actually lead to increases in caloric consumption. Food assistance programs have been cited as both a potential cause, but also as a potential solution, to high rates of obesity among low income individuals. While the primary purpose of food assistance programs is to increase food resources available to low income households, Jensen and Wilde describe how food assistance programs can help alleviate obesity by encouraging healthier food choices, providing nutrition education, and reducing the “boom and bust” cycles of consumption that are associated with weight gain.

In considering ways to address obesity among the general population, nutrition labeling is often cited as a method to help consumers better understand the caloric content of the foods they consume with the idea that this information will induce them to consume fewer calories. However, as described by Arsenault, rates of obesity have increased since enactment of the Nutrition Labeling and Education Act of 1990 which required nutrition labeling on all packaged foods and provided for nutrient content claims such as “low-fat” or “reduced-fat.” Newer options for front-of-package labeling and restaurant menu labeling may be potentially more effective at reducing caloric consumption. Another option frequently discussed is taxing calorically sweetened beverages—typically soda. As described by Todd and Zhen, very large taxes would be required to have even modest effects on individuals’ weight in the short run but would likely have greater effects over the long run as higher prices would encourage consumers to “kick the habit” of consuming soda.

Finally, drawing from the fields of economics and psychology, behavioral economics is providing less traditional tools for addressing obesity. As explained by Cash and Schroeter, “nudging” individuals towards making better food choices by, for example, changing the position of foods on a menu or in a cafeteria line, may help address rising rates of obesity. However, traditional economic approaches related to food pricing and market dynamics will continue to be relevant as a complement to newer behavioral economics approaches.

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THE COSTS OF OBESITY AND IMPLICATIONS FOR POLICYMAKERS

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JEL Classifications: I10, I18

Before the 1970s, obesity prevalence—body mass index (BMI) of 30 or greater—was creeping upward at a relatively slow rate (Flegal, 1996). However, between 1976 and 2005, the prevalence of obesity increased dramatically (Ogden et al. 2007). According to the National Health and Nutrition Examination Survey (NHANES), obesity prevalence in 2007-2008 was 32.2% and 35.5% among adult males and females, respectively, representing more than a 100% increase from 1976-1980 and a 50% increase from 1988-1994 (Flegal et al. 2010).

Since 2003-2004, obesity prevalence may be leveling off for some adult population subsets. However, this is not the case for the heaviest subset of obese individuals. Grade III obesity (BMI of 40 or greater) was extremely rare before the early 1970s but has since increased at a faster rate than obesity in general (Ogden et al. 2007). Roughly 5% of adults can now be classified as severely obese. These figures are alarming because of the numerous health conditions associated with obesity, including but not limited to cardiovascular disease, type 2 diabetes mellitus, osteoarthritis, several types of cancers, dementia, and others (Must et al. 1999; Field et al. 2001). Moreover, even among obese individuals, the likelihood of these conditions occurring rises with increasing BMI. Similar trends are now seen among children and adolescents. Diseases previously thought to be found only among adults, such as diabetes, have become more common among youth in the past 15 years (Pinhas-Hamiel and Zeitler, 2007).

Because of the health consequences resulting from excess weight, the increase in obesity prevalence has profound economic consequences on employers, insurers, and government. Not only are employers and government finding it increasingly difficult to finance the high costs of obesity-related medical treatments, but also obese individuals are more likely to be absent from work and be less productive while on the job—termed presenteeism, further adversely affecting firm profitability. In this article, we present the most recent estimates available in the literature of the per capita and aggregate direct and indirect costs of obesity from an annual and lifetime perspective. We then discuss the implications of these costs for government and employers, the two groups that finance the majority of health expenditures.

Direct Costs

Compared to normal weight individuals having a BMI between 20 and 24.9, it is estimated that Grade I obese adults with BMI between 30 and 34.9, and Grade II obese adults with BMI between 35 and 39.9, have 14% and 25% more physician visits, respectively than normal weight adults (Quesenberry, Caan, and Jacobson, 1998). Thompson et al. (2001) also found that obese adults have 48% more inpatient days per year and 1.8 times more pharmacy dispenses, including six times the number of dispenses for diabetes medications and 3.4 times the number of dispenses for cardiovascular medications.

Increased healthcare utilization among obese individuals logically results in increased annual medical expenditures. Several studies have quantified the increase in annual medical spending for obese persons. Sturm (2002) used nationally representative data to show that obesity was associated with a 35% increase in inpatient and outpatient spending and a 77% increase in prescription medication expenditures. In the most comprehensive analysis to date, Finkelstein et al. (2009) found that obesity increases per capita inpatient expenditures by 45.5%, outpatient and physician office expenditures by 26.9%, and prescription drug expenditures by 80.4% compared with normal weight expenditures. They then combined the per capita expenditure estimates with obesity prevalence data to present

estimates of the costs of obesity as a percentage of total health care spending separately by payer and by type of service.

Focusing on total payments, the estimates indicate that 8.5% of Medicare expenditures, 11.8% of Medicaid expenditures, and 12.9% of private payer expenditures are attributable to obesity. Across all payers, results indicate that obesity increases annual medical expenditures by 9.1% or \$147 billion per year. Largely due to the rapidly rising rate of obesity, this figure is double the estimate Finkelstein and colleagues generated using similar data from 1998. The publicly funded Medicare and Medicaid programs finance roughly 41% of the total costs attributable to obesity across service categories. Prescription drug expenditures are the largest cost driver, representing 40% of the costs.

Indirect Costs among Full Time Employees

As noted in the introduction, there is growing evidence that, in addition to increased medical spending, obese employees have greater rates of absenteeism and presenteeism (Finkelstein, Fiebelkorn, and Wang, 2005; Gates, et al. 2008). In a recent analysis, Finkelstein and colleagues combined multiple data sets to quantify per capita and aggregate estimates of medical expenditures and the value of lost productivity resulting from absenteeism and presenteeism for overweight and Grade I, II, and III obese full time employees (Finkelstein et al. 2010).

Their estimate of presenteeism is based on the validated Work Productivity and Activity Impairment (WPAI) questionnaire. Presenteeism is assessed with the question, "During the past seven days, how much did your health problems affect your productivity while you were working?" Participants indicated their level of work impairment via a rating scale ranging from zero to 10, with zero indicating that "health problems had no effect on my work" and 10 indicating that "health problems completely prevented me from working." Each response was assumed to represent a percentage reduction in productive work due to health problems—for example, a respondent reporting a value of three is assumed to have a 30% reduction in productive work, whereas a respondent reporting a 10 is assumed to be completely unproductive at work. All results were then annualized and monetized to present estimates of the dollar value of lost productivity.

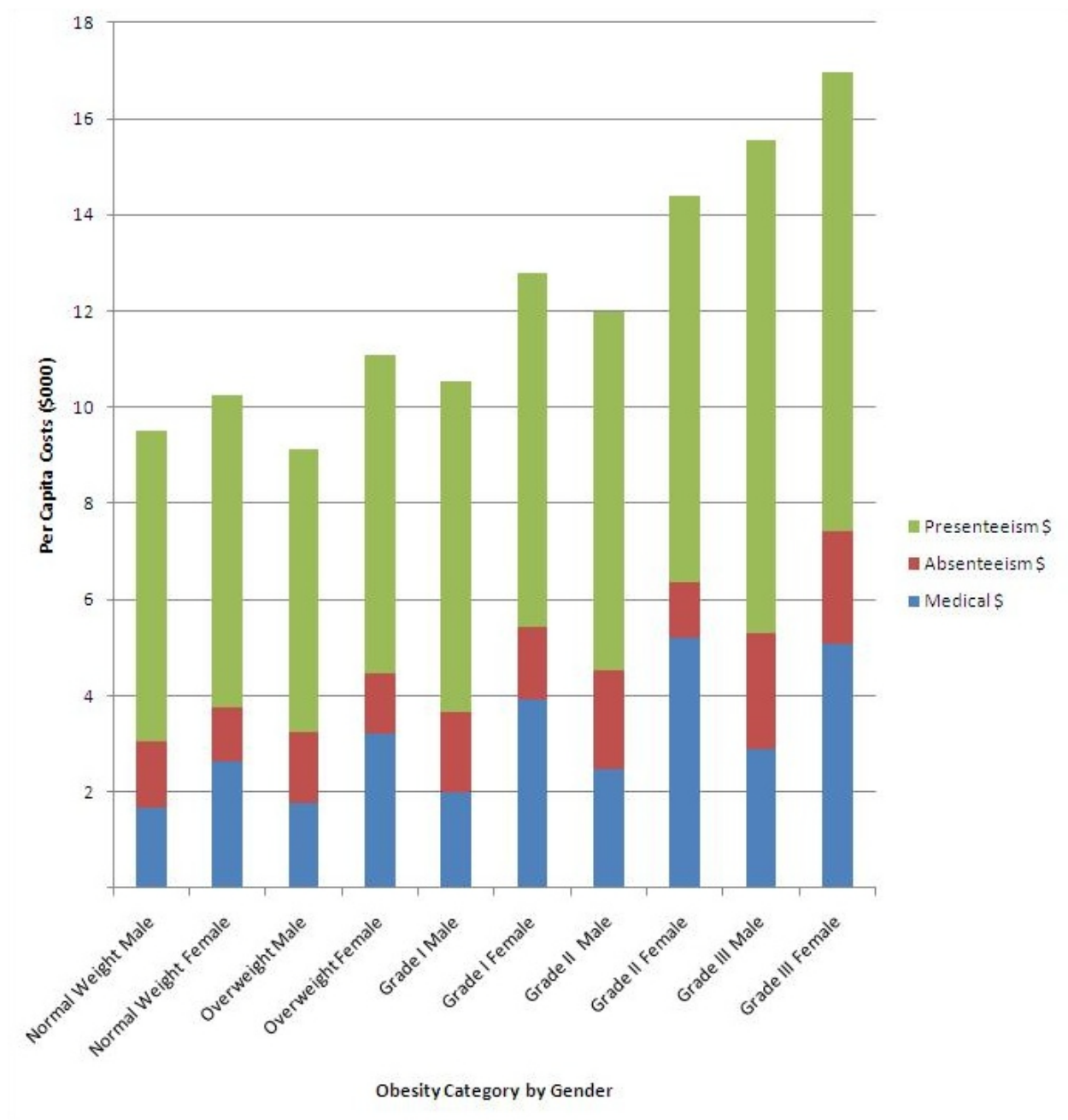
Figure 1 presents the incremental per capita medical expenditures and productivity losses due to each overweight and obesity strata among full time employees separately for men and women. Among men, increases in medical expenditures associated with obesity ranged from \$475 more for Grade I to \$1,269 more for Grade III obese male employees.

Annual missed workdays ranged from 0.5 more days for overweight men to 5.9 more days for Grade III men, the latter resulting in an annual cost of roughly \$1,000. Using the WPAI, presenteeism was shown to be the single largest driver of the costs of obesity for males and to roughly double between each obesity grade. Annualized estimates ranged from 2.3 days for Grade I to 21.9 days for Grade III obese men. The latter estimate equates to roughly one month of lost productivity per year at an average annual cost of \$3,792. Across the four categories, per capita obesity-attributable costs ranged from negative \$322 for overweight men to \$6,087 for Grade III obese men. Results were qualitatively similar for women. Across the four categories, the combined costs of medical expenditures and lost productivity due to absenteeism and presenteeism attributable to obesity ranged from \$797 for overweight women to \$6,694 for Grade III obese women (Finkelstein et al. 2010).

The authors combined the per capita estimates with obesity prevalence data from full time employees to generate the aggregate costs of obesity. The combined estimated value of medical expenditures, absenteeism, and presenteeism resulting from excess weight among full time employees, which represents roughly 65% of the civilian labor force, were estimated to be \$73.1 billion per year; 82% of this expense was roughly equally split between medical expenditures and presenteeism, and 18% resulted from increased absenteeism.

In addition to absenteeism and presenteeism, there is also evidence that obese individuals incur greater indirect costs due to more frequent and more expensive disability and worker's compensation claims (Trogdon et al. 2008). For example, one unpublished report by UnumProvident Corporation, an insurance provider, found that disability claims attributed to obesity have increased tenfold during the past decade, and that obesity-related disabilities cost employers an average of \$8,720 per claim (UnumProvident, 2004). Aggregate costs for these categories are not available.

Figure 1: Per Capita Medical Expenditures and Productivity Losses Due to Overweight and Obesity



Direct Lifetime Costs

Although the annual direct and indirect costs of obesity are large, some studies suggest that these estimates may be inflated because they do not account for differences in life expectancy between normal weight and obese individuals (Adams et al. 2006; Flegal et al. 2007). Ironically, premature death from obesity generates a direct medical cost savings, primarily to Medicare which finances the majority of medical costs for those aged 65 and above. Ultimately it is an empirical question whether or not the increase in costs resulting from obesity while alive is offset by reduced life expectancy.

Finkelstein et al. (2008) estimate the lifetime costs of obesity by combining age-, race-, gender- and BMI-specific medical cost and survival data for 20-yr old adults. After discounting future expenditures, lifetime medical costs for Grade I obesity range from \$5,340 for black women to \$21,550 for white women. For Grades II/III obesity, discounted lifetime medical costs range from \$14,580 for black men to \$29,460 for white women. One reason why these results may appear smaller than expected is because many of the adverse health consequences of obesity do not occur until individuals are well into adulthood. Discounting these costs from the perspective of an obese 20-year old significantly deflates their value. For example, the cost of obesity from the perspective of a 65-year old Grade III obese white woman is \$25,300, which is only slightly lower than the estimate for a 20-year old because from the perspective of a 65-year old, the costs of obesity are immediate.

These estimates focus solely on direct medical costs. Given that the difference in survival rates between obese and normal weight individuals is only a few years on average (Finkelstein et al. 2008) there is little to no 'savings' in indirect costs resulting from premature mortality.

Implications of Obesity Costs for Policymakers and Employers

The results from these studies reveal that the direct and indirect costs of obesity are large, even from a lifetime perspective. But what are the implications of these findings for the government, which incurs costs through Medicare and Medicaid programs, and for employers who incur costs through lost productivity and increased insurance premiums? Moreover, what can be done to reduce the costs?

From a public policy perspective, classical economists generally believe that the primary role of government is to resolve market failures. Although high costs or prevalence of obesity are not evidence of market failure per se, there may be market failures or distortionary government policies that are responsible for inflating obesity rates and costs beyond what would occur in the absence of these failures. As a result, and given the rapidly rising rates and costs of obesity, it would be appropriate for governments to identify and remediate these failures in efforts to stem the rise in obesity rates and related costs.

Several articles in this Choices theme identify market and government failures in more depth; however one common example is the government subsidy to corn and soybean producers, which ultimately lowers the market price of all animal source foods such as beef, pork, and poultry; products made with high fructose corn syrup, and hydrogenated fats and oils. Some researchers have suggested that the low price of these products is partly responsible for the rise in obesity rates, and that removal of these subsidies could potentially have a positive influence on weight outcomes (Popkin, 2008; Finkelstein and Strombotne, 2010). This topic is discussed further in the article "Farm Policy and Obesity in the United States" found in this issue of Choices.

Beyond market failures, policymakers often use the high costs of obesity to motivate obesity prevention efforts. The most efficient strategy to recover the external costs of obesity would be to experience-rate publicly funded health insurance programs. Experience-rating involves charging obese individuals higher rates based on their higher expected costs. Although this might be infeasible for low-income beneficiaries, a strategy that incorporates experience rating and means testing is feasible and in fact is already being implemented in several public and private health plans (see N.C. state health plan targets smokers and obese, 2009).

In the absence of experience rating, touting the high costs of obesity to justify obesity prevention efforts is only a valid argument if these interventions save more money than they cost. Otherwise the costs of obesity will continue to increase even if the interventions are successful at improving weight and health outcomes. In other words, even cost-effective interventions—those that reduce weight and improve health at a reasonable return—would not be appropriate if the objective is to save money. The requirement for cost savings is an extremely high bar for publicly funded health promotion efforts and may ultimately prove infeasible. This is not to say that efforts should not be made to address obesity, but only that cost savings may not be the appropriate justification.

Finally, in the absence of experience rating, governments are increasingly considering targeted sin taxes as a means to recoup their costs resulting from obesity. While many foods and even nonfood items such as video games or televisions are viable candidates, policymakers are increasingly targeting calorically-sweetened beverages (CSBs) like sodas and sugary sports drinks. Although a number of state and local governments have recently initiated taxes on CSBs, economists disagree over the extent to which these taxes are appropriate (see "Can Taxes on Calorically Sweetened Beverages Reduce Obesity?" in this issue of Choices).

From an employer's perspective, the high direct and indirect costs of obesity represent a significant cause for

concern, yet profit-maximizing strategies for addressing obesity among employees are complicated by several factors. If employers were completely free to set wages, all other things equal, they might adjust wages such that the increased costs of obesity among employees were born entirely by the obese individual. Under this circumstance, the firm bears none of the costs of obesity and should theoretically be indifferent between hiring normal weight or obese employees. Although there is some evidence that obese white women take a wage penalty compared to their normal weight counterparts, there is no evidence of wage adjustments for men or for nonwhite women, suggesting that some of the costs of obesity are borne by the firm (Cawley, 2004; Bhattacharya and Bundorf, 2009). Unions, contracts, minimum wage laws, and the threat of litigation and public backlash all make it difficult for employers to fully adjust wages to offset the costs of obesity. Therefore, employers need to consider alternative strategies for addressing the high rates and costs of obesity among employees.

Because employers are profit-maximizers, an additional challenge for firms is finding obesity interventions that are effective and save money. Many cost-effective obesity interventions that improve health at a reasonable cost are unlikely to receive corporate backing if the interventions do not save money, because most employers will require cost savings, not just cost-effectiveness. Furthermore, due to high job turnover, many firms will be unwilling to substantially invest in obesity prevention and treatment efforts largely on the grounds that some other firm will reap the benefits of these efforts. Investing in employee health made sense 50 years ago when individuals tended to work one or two jobs in their entire career. Today, the average job tenure of private sector employees is less than four years so investments in long-term health are unlikely to show a positive return to the firm. As a result, private sector companies will under-invest in obesity prevention efforts because they receive only a fraction of the benefits from their investment.

The 2010 Affordable Care Act now mandates that large firms offer health insurance to their employees or face a significant financial penalty. Although employer-based coverage and high job turnover reduce incentives for businesses to invest in prevention, firms could benefit from a slimmer, healthier, and perhaps less costly, more productive population if they could be encouraged to make these investments. Ultimately, the encouragement will need to come from the government in the form of direct funding, subsidies, or regulation. This is not only because it is government policy that first encouraged—via tax breaks—and now essentially requires firms to provide health insurance, but also because government has a financial stake in seeing employers implement these efforts given that most employees will eventually become Medicare enrollees. In fact, the federal government may be the single greatest beneficiary of workplace obesity prevention and health promotion efforts. Only time will tell whether or not these efforts prove to be cost-saving, but one thing is certain—without them obesity rates and costs are unlikely to decrease any time in the near future.

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FOOD ENVIRONMENT, FOOD STORE ACCESS, CONSUMER BEHAVIOR, AND DIET

Michele Ver Ploeg

JEL Classifications: I18, R50

Some low-income neighborhoods in the United States have been dubbed “food deserts” because there are few sources of healthy and affordable foods. Often these neighborhoods are served by convenience stores or fast food restaurants but are far from grocery stores that offer a full range of healthy foods. Some residents of these neighborhoods that lack transportation or have low incomes may be more reliant on smaller neighborhood stores that do not carry a full range of groceries and may not offer them at the most competitive prices. Some concerned groups have argued that the lack of healthy options leads to poor diets and to diet-related conditions such as obesity.

Concern over food deserts and the food environment in general has led some states and cities to enact programs that increase access to healthy foods. For example, Pennsylvania and New York City provide public and private funding to encourage supermarkets and other healthy food retailers to open in underserved areas. One of the four pillars of the First Lady’s Obesity Initiative, Let’s Move, is to increase access to affordable and healthy food, and President Obama’s proposed FY2011 budget calls for \$400 million to encourage the development of healthy food options in underserved neighborhoods (White House Task Force on Childhood Obesity, 2010).

The extent to which such policies are needed and their potential success, however, depends on how many people are impacted by limited access to affordable and healthy food, how consumers are affected by limited access and the food environment, and how they cope with food access limitations.

A Small Share of People Live in Food Deserts

There is no single method for measuring and defining food deserts and food access, especially in a country as large and geographically diverse as the United States. A number of different studies using many different methods have examined food deserts in local areas. A national-level U.S. Department of Agriculture (USDA) study of the extent of the population with limited access to food used the availability of supermarkets and large grocery stores—including discount and supercenter stores—as a proxy for the availability of affordable, nutritious food (USDA, 2009). A directory of supermarkets and large grocery stores throughout the continental U.S. was used to examine distance to the nearest supermarket or large grocery store for vulnerable populations—low-income, elderly, and households without access to a personal vehicle.

This USDA study found that about 23.5 million people, or 8.4% of the U.S. population, live in low-income neighborhoods that are more than a mile from a supermarket (USDA, 2009). Low-income neighborhoods are areas where more than 40% of the population has income less than or equal to 200% of Federal poverty thresholds, which was \$44,000 per year for a family of four in 2008. Not all of those living in low-income neighborhoods are poor and so are less affected by lack of access. If only those with income below 200% of poverty are considered, then 11.5 million or 4.1% of Americans have low incomes and live in low-income neighborhoods that are more than a mile from a supermarket.

Vehicle ownership is another indicator of whether someone who lives far from a grocery store lacks access to healthy food. About 2.3 million households, or 2.2%, live more than a mile from a supermarket and do not have access to a vehicle (USDA, 2009). For these households, lack of transportation poses a barrier to accessing affordable and nutritious food.

Healthier Food Environments, Healthier Diets, and Thin Causal Evidence

Many factors contribute to an individual's body weight and overall dietary health. These include individual factors, such as demographic characteristics, socioeconomic status, education, and preferences for food. Environmental factors can also impact body weight and dietary health. Such factors can include access to stores and restaurants, parks and recreation facilities, sidewalks, and the availability of public transportation, and social environmental factors like crime, neighborhood cohesion, and the social and cultural norms around food. Research has shown that individual factors can explain some differences in who becomes obese or who acquires diabetes, but alone, they cannot account for all the differences in rates of these diseases. The food environment and food store access may help explain differences in diet and health outcomes (Diez-Roux, 2009).

A number of studies have examined the relationship between food access, dietary intake, and obesity. Although results are not universal, most find that better access to supermarkets is associated with healthier diets and reduced risk of obesity, while greater access to convenience stores is associated with increased risk of obesity (Larson, Storey, and Nelson, 2009). In contrast, the relationship between fast food restaurant access and diet and obesity is not as consistent in the literature.

The National Food Stamp Program Survey (NFSPS) has been used to understand how store access was related to food spending—particularly on fruits and vegetables. Rose and Richards (2004) found that those with limited access spent less on fruits than those with better access. USDA (2009) found that those with limited access spent less on noncanned fruits, non-canned vegetables, and milk than those with better access.

These studies suggest a correlation between store access and diet-related outcomes, but none of these studies uses methods that can determine whether store access causes differences in diet or obesity. Only a few studies have used methods that can help assess causal relationships—and their evidence is mixed. Two studies used longitudinal data and a pre-post intervention design to measure how changes in access affect shopping behavior and dietary intake when supermarkets opened in underserved areas in Leeds and Glasgow, UK (Wrigley, Warm, and Margetts, 2003; Cummins et al. 2005). Both found that many sampled individuals from the neighborhood switched their shopping to the new store. Consumption of fruits and vegetables increased modestly in one study—just over one-third of a serving, but did not increase in the other study. Chen et al. (2010) use spatial econometrics to account for how residential choice and social networks influence diet. Accounting for these factors, this study found that proximity to fast food restaurants slightly increases body mass index (BMI), while proximity to grocery stores slightly decreases BMI. The sizes of the total effects were less than half a BMI point but were larger for people who lived very close to a store or restaurant.

Low-Income Consumers Shop for the Lowest Prices

Improved access to sources of healthy foods may have a small impact on diet because those who live in food deserts cope by shopping at supermarkets outside their neighborhoods. As a result, their diets may not change much if a new supermarket opens closer to them. Research on the food-shopping behavior of participants in the Supplemental Nutrition Assistance Program (SNAP)—shows that almost 90% of SNAP benefits are redeemed at supermarkets or large grocery stores (USDA, 2009). Further, while SNAP participants on average lived 1.8 miles from the nearest supermarket, they traveled an average of 4.9 miles to get to the store they most often used to buy groceries (Ohls et al. 1999). Shopping further from home means greater travel and time costs as has been estimated by other studies (Rose et al. 2009; USDA 2009). On the other hand, lower prices at supermarkets and supercenters may offset these travel and time costs.

The 2009 USDA study also examined prices consumers paid at four different store formats—grocery, convenience, discount/supercenters, and “other”—for three frequently purchased foods—milk, ready-to-eat cereal, and bread. Data on food purchases of approximately 40,000 representative U.S. households were used and characteristics of the foods, such as fat content of milk or product size, were controlled. Results show that convenience store prices were higher than prices at grocery stores—milk prices were 5% higher; cereal, 25% higher; and bread, 10% more. However, food purchases at convenience stores make up just 2% to 3% of total food expenditures for low-income consumers who, along with middle-income consumers, are more likely than higher income consumers to purchase food at supercenters, where prices are lower (Broda, Leibtag, and Weinstein, 2009).

Broda, Leibtag, and Weinstein (2009) used the same household-level purchase data to analyze differences in prices paid for the same food items by consumers with different income levels. The analysis shows that many low-income consumers can find lower prices, but not all. Consumers with annual incomes between \$8,000 and \$30,000 paid the least of all income groups for the same food items. More worrisome, however, is that households with annual incomes less than \$8,000 paid slightly more—between 0.5 to 1.3%—for the same foods compared with those with incomes between \$8,000 and \$30,000. Households with annual incomes over \$100,000 paid the most for the same food items—between 2% to 3% more than poorer households. Presumably this is because they are less likely to shop at supercenters than low- and middle-income consumers, do not buy sale items as often as lower-income consumers, and are less willing to incur the time costs of shopping for the lowest prices.

Supply or Demand Factors and Access to Healthy Food

Economic theory suggests that either supply factors or demand factors or both could cause variation in what and where food stores are available. A neighborhood could lack a supermarket or large grocery store because the costs food retailers face when building and/or operating a store in those locations are higher. Zoning rules, such as the amount of parking required for new businesses, employee training, and security costs have also been cited as reasons for few stores in underserved, poor communities (Food Marketing Institute, 1998; The Reinvestment Fund, 2008). Consumers' demographic and economic characteristics, buying habits, and tastes could also explain why stores do not locate in some areas or carry particular foods. More densely populated neighborhoods and those with growing populations are often able to support more stores. As a result, some less densely populated rural areas, or urban areas with diminishing populations, have fewer supermarkets. Food expenditures increase as income rises, which may explain why higher-income neighborhoods have more supermarkets than some lower income neighborhoods.

Many communities are developing policies to encourage stores to locate in underserved areas or to help existing stores offer more healthy options. The Pennsylvania Fresh Food Financing Initiative is a public-private partnership that has used state and Federal funding, along with private funding, to provide grants and loans to develop new stores or refurbish existing stores in underserved markets. This program is the model of the proposed Federal Healthy Food Financing Initiative (HFFI). In other efforts, communities have modified existing corner stores by upgrading coolers; increasing the availability of fruits and vegetables, low-fat milk options, and whole grain foods; or changing the physical layout of the store. Baltimore City created a grocery delivery system to increase access to healthy foods. Grocery ordering, delivery and pick-up, including redemption of SNAP benefits, are available in public libraries in lower-income Baltimore neighborhoods with few sources of healthy food (Schleiter, 2010).

There is very little research on the effectiveness of these different private and public policies to improve healthy food spending, diet, and health outcomes. Most policies to reduce the impact of food access limitations have focused on increasing or improving the supply of healthy foods. This could be an important investment in underserved areas for economic, social, and cultural reasons, and it may make it easier for residents of the area to access healthy food. But it is unlikely that these policies will make much of a dent in improving diets, reducing obesity, and improving dietary health unless consumers change their eating habits. Almost two-thirds of Americans are overweight, but national estimates presented here indicate that only 2% to 8% of Americans have limited access to healthy food. Even though most Americans have fabulous access to healthy foods, on average, they eat only about half the recommended daily levels of fruits and vegetables (Report of the Dietary Guidelines Advisory Committee, 2010). Even if supermarkets are accessible to all, it is not clear consumers will significantly improve their diets by shopping at them—supermarkets carry all the unhealthy foods that small corner stores do and usually offer them at lower prices.

It may be that for too many Americans, healthier foods are not the easiest choices to make. Less healthy

foods could be relatively easier—and for many, tastier—to choose because they are easily accessible and because healthier foods, particularly fruits and vegetables and home cooked meals can take more time to plan and prepare. Unhealthy foods may “swamp” healthy foods in many areas (Rose et al. 2009), but perhaps particularly in areas that are food deserts. In addressing limited access to healthy foods and improving diets in general, it may be more important to encourage greater demand for healthy foods in a way that discourages demand for less healthy food.

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FARM POLICY AND OBESITY IN THE UNITED STATES

Julian M. Alston, Bradley J. Rickard, and Abigail M. Okrent

JEL Classifications: I18, Q18

Many commentators—including prominent economists, nutritionists, journalists, and politicians—have claimed that American farm subsidies have contributed significantly to the “obesity epidemic” by making fattening foods relatively cheap and abundant, and that reducing these subsidies will go a long way towards solving the problem. These commentators often treat the issue as self-evident, and do not present either details on the mechanism by which farm subsidies are supposed to affect obesity, or evidence about the size of the likely impact. In this article we examine the consequences of U.S. farm subsidies—including indirect subsidies provided by trade barriers as well as direct subsidies—for prices of farm commodities and thus food products and caloric consumption patterns in the United States. We show that U.S. farm subsidies have had generally modest and mixed effects on prices and quantities of farm commodities, with negligible effects on the prices paid by consumers for food and thus negligible influence on dietary patterns and obesity. This result is consistent with some previous work by economists on the issue (see Alston, Sumner, and Vosti, 2008 and the papers they cite), but contradicts the mainstream view in the media.

Farm Policy and Commodity Prices

A simplistic model of farm subsidies and obesity, which is implicit in some writings on the subject, presumes a textbook subsidy policy that results in an increase in both production and consumption of the subsidized good by increasing the net return to producers—the market price plus the subsidy—and lowering the market price paid by consumers. However, the main elements of U.S. farm subsidy programs are significantly different from simplistic textbook subsidy policies.

Farm subsidies have resulted in lower U.S. prices of some commodities, such as food grains or feed grains, and consequently lower costs of producing breakfast cereal, bread, or livestock products. But in these cases, the price depressing—and consumption enhancing—effect of subsidies has been contained, or even reversed, by the imposition of additional policies such as acreage set-asides that restricted acreage or production. So the effects of the subsidy on quantities produced and consumed, and consumer prices, are smaller than the textbook model would suggest.

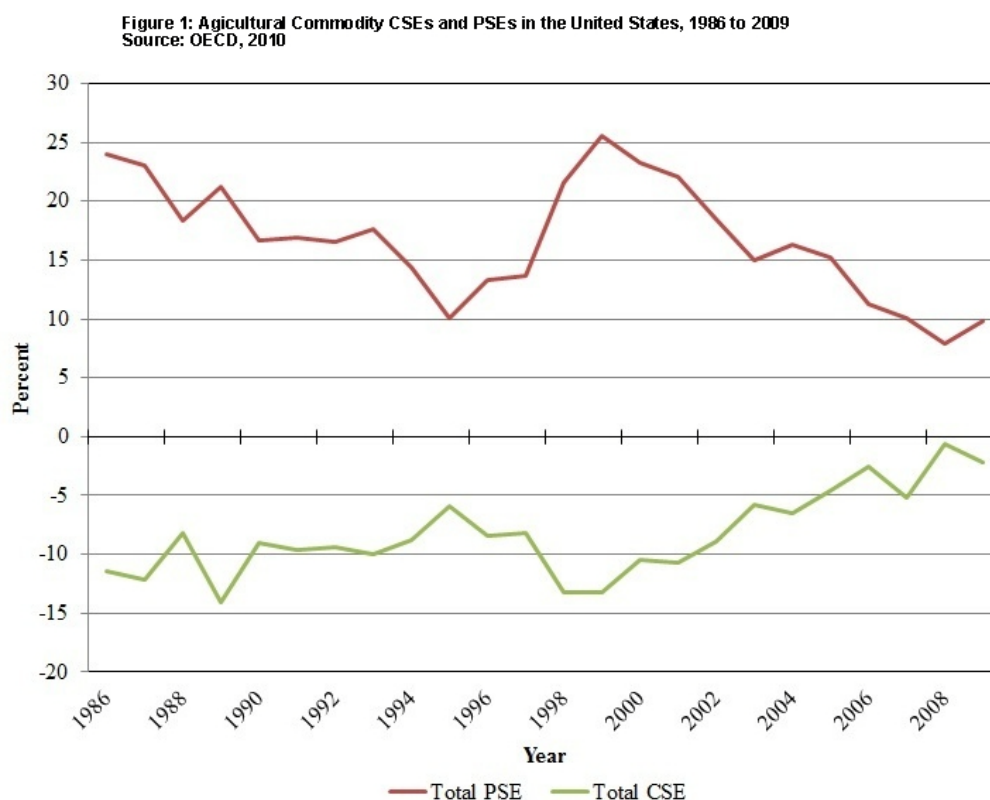
In addition, for more than a decade, about half of the total subsidy payments have provided limited incentives to increase production because the amounts paid to producers were based on past acreage and yields rather than current production. Moreover, for the commodities that are subject to U.S. import barriers, the policy increases farm and food prices domestically, and provides a disincentive to consume foods that use these commodities as ingredients. Trade barriers that apply to imported sugar, dairy, orange juice, and beef increase the prices of these agricultural commodities, and thereby increase the cost and discourage consumption of foods that use these commodities.

The combination of subsidies for some commodities and trade barriers for others makes the story complicated at times. A case in point is the market for caloric sweeteners. Corn is often the target of criticism as a contributor to obesity, especially because of its use in production of high fructose corn syrup (HFCS), which is used as a caloric sweetener in many foods and beverages. Farm subsidies are responsible for the growth in the use of corn to produce high fructose corn syrup (HFCS) as a caloric sweetener, but not in the

way it is often suggested. The culprit here is not corn subsidies; rather, it is sugar policy that has restricted imports, driven up the U.S. price of sugar, and encouraged consumers and food manufacturers to replace sugar with alternative caloric sweeteners, especially HFCS. Combining the sugar policy with the corn policy, the net effect of farm subsidies has been to increase the price of caloric sweeteners generally, and to discourage total consumption while causing a shift in sweetener use between sugar and HFCS (Beghin and Jensen, 2008).

Measures of Commodity Price Impacts

Producer Support Estimates (PSEs) are often used to represent agricultural support as a share of the total value of agricultural production, and Consumer Support Estimates (CSEs) represent the support provided to food consumers as a share of the total value of food commodity consumption. Calculated values for total PSEs and CSEs in the United States between 1986 and 2009 are shown in Figure 1. These PSEs and CSEs are not perfect measures of the effects of farm policies, but they are commonly used by agricultural economists to summarize the support applied to farm commodities. The policies represented in these measures include hundreds of specific provisions under farm bill programs and trade barriers that raise U.S. farm prices and incomes for producers of favored commodities, either through transfers from taxpayers, or at the expense of consumers, or both. Farm subsidies that encourage agricultural production may lead to lower relative prices and increased consumption, but trade barriers—like U.S. policies for sugar, dairy, orange juice, and beef—make agricultural commodities more expensive, increase the cost of certain food products, and if anything discourage consumption of foods that use these commodities. The PSEs and CSEs in Figure 1 show that while U.S. farm policy has, overall, subsidized farm commodity producers it has taxed food consumers relative to world market prices. Figure 1 also shows that subsidies for producers and taxes on food consumers related to farm policies fell between 1986 and 2009.



However, some U.S. farm subsidy policies also affect world market prices, and a more complete measure of the effect of farm policies on consumer prices has to take these effects into account. Economists have modeled and projected the likely economic consequences of U.S. farm subsidies for prices and production. Work in this area has found that eliminating existing farm programs would have very modest effects on farm

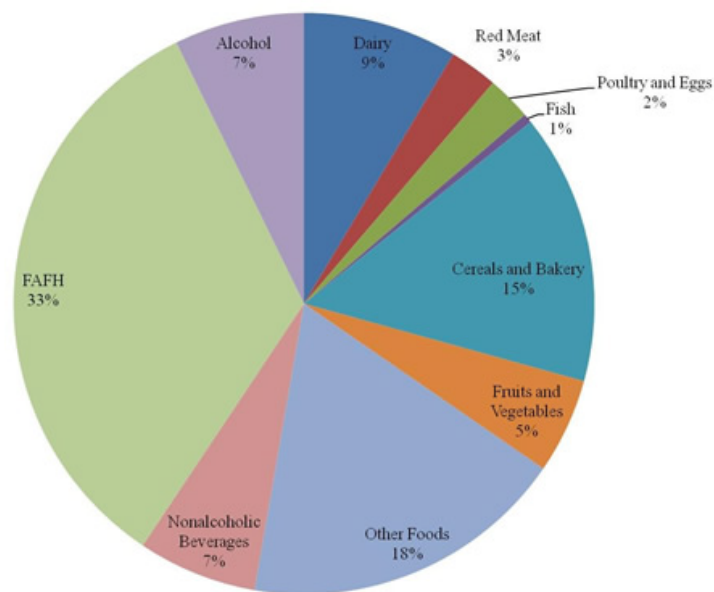
prices and production of the main farm commodities. Alston, Sumner, and Vosti (2008), for instance, reported estimates indicating that the removal of U.S. farm policy in the mid 2000s would have yielded only modest reductions in grain and oilseed production and prices, ranging between 5% and 10%. Only sugar and rice would have experienced a reduction in production of more than 10%, and only sugar would have seen a price change of more than 10%. These modest impacts were based on simulations beginning with relatively large market distortions before subsidy rates fell with the recent increases in commodity market prices. The effects would be even smaller if policies were eliminated today. An important point is that removing U.S. farm policy would have mixed effects on commodity prices. Elimination of farm subsidies would result in increases in prices only for wheat and corn. For every other commodity category the net effect of eliminating subsidies would be to reduce prices, encouraging the consumption of meat and dairy products, fruits and vegetables, and sugar, with mixed implications for nutritional outcomes.

Commodity Prices, Food Composition, and Food Prices

We used results from previous studies combined with information about commodity-specific CSEs to estimate the likely changes in prices of farm commodities given the removal of U.S. farm subsidies, including indirect subsidies provided by border measures. Then we used these estimates of farm commodity price impacts in a simulation model of the supply chain to calculate the implied changes in caloric consumption of ten categories of food and beverage products.

Farm commodities used as ingredients represent a small share of the total cost of retail food products, and this share has been shrinking for all farm commodities over the past three decades (USDA-ERS, 2008). On average the farm commodity cost share is approximately 20%, but it varies widely: for grains, sugar, and oilseeds, it is less than 10%; for soda, a food product that is often associated with obesity, the share is approximately 2%; for retail fruit and vegetable products—fresh and processed—it is approximately 18%; and it is closer to 35% for meat and eggs. In the U.S., food consumed away from home accounts for nearly 37% of food expenditures and 33% of average daily calories (Figure 2), but the cost of farm commodities as a share of the value of foods consumed in this category is tiny.

Figure 2: Average Calorie Intake per Day for Adults in the United States, 2005–2006
Source: Authors' calculations based on one day of dietary recall data from the 2005–2006 NHANES (CDC, 2010)



The small farm commodity shares of food costs mean that small commodity price impacts from removal of farm policy would lead to very small effects on consumer costs of food and beverages, especially for some of the categories most commonly associated with obesity. In addition, if such changes in the costs of food

products were not fully passed on to consumers, they would see even smaller percentage changes in retail food prices.

We calculated changes in retail prices associated with the removal of farm subsidies for ten food product categories using simulated changes in commodity prices together with recent farm-retail marketing margins. The mechanisms are complex because some food items use multiple commodities and some commodities, such as feed grains, themselves are inputs into other farm products. For example, the retail cost of meat and dairy products would increase because the removal of subsidies would increase the cost of corn. The farm cost of livestock represents only about one-fifth of the retail cost of meat. Hence, assuming corn and other feedstuff represent about 30% of the farm cost of meat and dairy items, a 5% increase in the farm price of corn would imply a 1.5% increase in the farm cost and a 0.3% increase in the retail price of meat for consumers. Similar calculations apply for other retail foods, with the multipliers from farm commodity prices to retail prices varying with the farm-commodity share of the consumer food dollar.

Policy Simulations

We used an equilibrium displacement model (Okrent, 2010) to simulate the effects of farm subsidies applied to eleven agricultural commodity categories (Table 1) on caloric intake patterns of 10 categories of food products. The food products include eight exhaustive categories of food-at-home products—cereals and bakery products, red meat, poultry and eggs, fish and seafood, dairy products, fruits and vegetables, nonalcoholic beverages, other foods including fats and oils, and sugars and sweeteners: a composite food-away-from-home product; and alcoholic beverages. Four simulation experiments were performed to better understand how various policy changes would affect commodity prices, food prices, food consumption, and ultimately annual per capita caloric intake. We first simulated the effects of removing only grain subsidies, based on published measures of policy price impacts consistent with policies in the mid-2000s. The other three simulations show the effects of removing all U.S. farm subsidies, including indirect subsidies provided by trade barriers that have applied in different time periods—with price impacts based on the published measures plus CSEs for different time periods—along with the measures of grain subsidy impacts on prices used in the first simulation. One set of simulations is based on CSEs in 2006, a reasonably representative recent year just before the spike in commodity prices after which CSEs have been relatively low. The other two simulations are based on CSEs for the previous 10 years and the previous 21 years. The percentage changes in farm commodity prices for each of the four simulations are given in Table 1, along with key findings.

Our results indicate U.S. farm subsidy policies, for the most part, have not made food commodities significantly cheaper and have not had a significant effect on caloric consumption. Eliminating U.S. grain subsidies alone would lead to a small decrease in annual per capita caloric consumption—simulated to be 977 calories per adult per year, which would imply a 0.16% per year reduction in average body weight assuming 3,500 calories per pound. In contrast, removing all farm subsidies, including those provided indirectly by trade barriers, would lead to an increase in annual per capita consumption in the range of 200 to 1,900 calories—equivalent to an increase in body weight of 0.03% to 0.30%, depending on the size of the policy-induced price wedges to be removed, as represented by the CSEs. The CSEs were generally smaller in 2006 than over the decade 2000–2009 and more than over the longer period 1989–2009. Thus the smaller estimates, based on the 2006 CSEs, are probably the most relevant.

As our results show, the measured economic effects of a simulated policy reform depend on specific characteristics of the analysis:

- a. what the reform includes—partial, applied to grains alone, versus more comprehensive;
- b. when it applies—which determines the size of the distortions to be eliminated; and
- c. the modeling details—in particular, how we allow for shifting incidence between farmers and consumers at home and abroad through different elasticities and different detailed representation of policies.

Table 1**Simulated Effects of Elimination of U.S. Subsidies on Consumption and Weight**

	Policy Simulated			
	Elimination of grain subsidies	Elimination of grains subsidies and trade barriers based on CSEs in selected years		
		2006	2000-2009	1989-2009
	Percentage Farm Commodity Price Change			
Oil-bearing crops	0	0	0	0
Grain crops	8.4	8.4	8.4	8.4
Vegetables and melons	0	-5.0	-5.0	-5.0
Fruits and tree nuts	0	-5.0	-5.0	-5.0
Sugar cane and beets	0	-31.0	-54.2	-55.7
Other crops	0	0	0	0
Beef cattle	2.9	2.9	2.9	2.9
Hogs & other meat animals	2.9	2.9	2.9	2.9
Dairy cattle	2.9	-9.6	-25.0	-31.8
Poultry and eggs	4.8	4.8	4.8	4.8
Fish and aquaculture	0	0	0	0
	Annual Impacts on Per Capita Caloric Consumption and Weight			
Consumption (kcal)	-977	198	1,374	1,884
Weight (kg)	-0.13	0.03	0.18	0.24
Weight (%)	-0.16	0.03	0.22	0.30

Note: Average weight of an adult individual in 2005-2006 NHANES was 80.95 kg. The calculation assumes 3,500 kcals additional consumption would add one pound to weight.

In estimating price impacts we assumed that the impact of policy change would be transmitted entirely to consumers. In this sense our estimates are at the high end of the feasible range. Nevertheless, our simulated results show fairly small positive or negative impacts on total caloric consumption and thus potentially on obesity. This result holds even when we allow for comparatively large policy impacts on buyer prices of farm commodities, with the sign and size of the effect contingent on whether it is assumed that import barriers that raise the buyer prices of dairy, sugar, and fruits and vegetables are to be eliminated along with subsidies on

grains.

Implications for Obesity in the United States

A careful examination of the linkages between farm policy, food prices, and obesity in the United States demonstrates that U.S. farm commodity subsidy policies have had very small effects on obesity. This finding is driven by three key factors. First, with a few exceptions, farm subsidies have relatively small and mixed impacts on prices of farm commodities in the United States. Second, the share of the cost of commodities in the cost of retail food products is small, and continues to shrink over time. Third, food consumption patterns do not change substantially in response to small changes in food prices.

Our specific simulation results across a range of scenarios show that the impact of farm policy is small and mixed, such that the net effects are ambiguous. Eliminating all farm subsidy policies, including trade barriers, would decrease consumption of some food products, but would increase consumption of other food products, most likely leading to an increase in overall caloric consumption. In other words, contrary to common claims in the popular media, farm policies have more likely slowed the rise in obesity in the United States—but any such effects are small. Compared with other factors, the policy-induced differences in relative prices among various farm commodities have played only a tiny role in determining excess food consumption and obesity in the United States.

Farm commodities have indeed become much more abundant and cheaper over the past 50 years in the world as a whole as well as in the United States, but not because of subsidies. This abundance mainly reflects the effects of technological innovations and increases in farm productivity, which has alleviated hunger and poverty throughout the world while at the same time reducing pressure on the world's natural resources. If cheaper and more abundant food has contributed to obesity, then we should look to innovations in production agriculture rather than farm subsidies as the fundamental cause. Even so, it would be a mistake to seek to oppose and slow agricultural innovation with a view to reducing obesity rates. Conversely, though it might be beneficial in other ways, eliminating U.S. farm subsidies would have negligible consequences for obesity rates. The challenge for policy makers is to find other—more effective and more economically rational—ways to reduce the social consequences of excess food consumption, while at the same time enhancing consumption opportunities for the poor and protecting the world's resources for future generations.

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MORE THAN JUST FOOD: THE DIVERSE EFFECTS OF FOOD ASSISTANCE PROGRAMS

Helen H. Jensen and Parke E. Wilde

JEL Classifications: I18, I38, Q18

For decades, from the 1940s to the 1970s, the goal of U.S. food and nutrition assistance programs seemed clear: to make sure low-income Americans could afford enough food. By pursuing this goal, the programs would protect program participants from hunger and also support demand for farm products. Today, about one in five Americans receives benefits from at least one of the U.S. Department of Agriculture's (USDA) food programs. The major programs include the Supplemental Nutrition Assistance Program (SNAP), Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), school meals programs—lunch and breakfast, and the Child and Adult Care Food Program. Despite the food programs' goal of reducing hunger and improving nutrition, rising concern about overweight and obesity for all Americans has triggered arguments that targeted food benefits could be counter-productive. As a recent retrospective on a century of food and consumer economics explained, "The policy context for food assistance programs has changed in the past three decades." (Unnevehr et al. 2010, p. 512).

This policy context has motivated new research about how food assistance programs affect body weight and the risk of overweight. For example, a recent USDA study compared women who participated in the Supplemental Nutrition Assistance Program (SNAP)—the new name for the Food Stamp Program—to low-income nonparticipants (Ver Ploeg and Ralston, 2008) (Figure 1). From the 1970s to the 1990s, Non-Hispanic White women who participated in SNAP had higher weights, hinting—but by no means proving—that the program had unintended consequences for weight status. In the 1990s, by contrast, the gap between participants and nonparticipants disappeared. Unfortunately, this disappearance is not as much good news as you might think. The gap disappeared because nonparticipants gained weight faster in the 1990s, reaching the same high weights that SNAP participants had on average.

It is well known that such comparisons of participants and nonparticipants provide only limited information about real program effects. There are many plausible interpretations of a weight gap between participants and nonparticipants. People with higher weights may be more likely to participate in food assistance programs for other reasons, such as giving a higher priority to food or having poorer health.

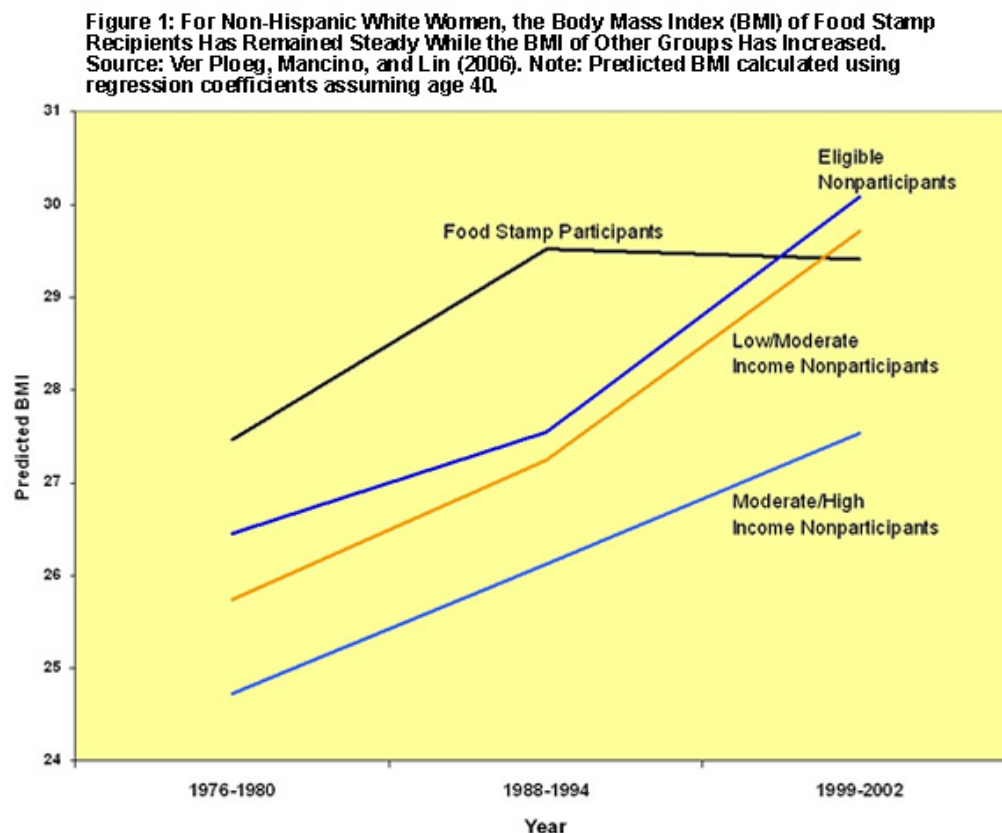
To some extent, this problem of multiple interpretations can be addressed with more advanced statistical analyses. Several studies over the years, using diverse methods, have suggested that participation in SNAP appears to increase the risk of obesity, at least for women, even when one controls as well as possible for other confounding factors (Gibson, 2003; Meyerhoefer and Pylypchuk, 2008). Yet, it remains very difficult to demonstrate directly that food assistance programs either do or do not raise the overall risk of overweight and obesity.

What the Programs Do

To understand the potential effects of food assistance programs, it is useful to take a closer look at what the programs actually do. Experts have reached widely different conclusions about the effect of food assistance programs on ultimate health outcomes in part because they give different levels of emphasis to the diverse activities that food assistance programs carry out. To take just one example, if you think of food assistance

programs mainly as a way to increase total food intake, you may be more worried about the effect on obesity. On the other hand, if you think of food assistance programs mainly as a way of assuring a reliable and steady source of food, less subject to the “boom and bust” cycles of hunger and food insecurity, you may be more optimistic that the programs will reduce the risk of obesity.

Consider the following five major activities of food assistance programs, which could affect weight status in surprisingly diverse ways, both favorable and unfavorable. The research literature has long studied some of these program activities, while research on others has just begun.



Permit Participants to Acquire More Food

SNAP benefits per participant per month in 2009 averaged \$124, which must by law be spent only on eligible food and beverages from authorized retailers. Of course, the participants would have had to spend money on food even in the absence of the program, so not all of these SNAP benefits represent an additional increase in food spending. Assuming that 20% of the benefits are truly additional, beyond what would have occurred anyway, the program increased food expenditures by about \$25 per person per month on average. The WIC program provides a package of supplementary foods to eligible low-income women, infants, and young children. The levels and types of foods are chosen to enhance the amount of available foods and nutrients consistent with current scientific evidence. School-age children from low-income families are eligible for free or reduced price meals through the National School Lunch Program and School Breakfast Program.

These programs substantially increase the total food resources available to low-income families. The proportional impact on actual food intake in terms of food energy—calories—is much smaller, because the increased food resources allow families to prioritize many aspects of food quality and desirability beyond just quantity of calories. Nevertheless, either explicitly or implicitly, the argument that food assistance programs contribute to obesity usually hinges on the belief that these additional food resources may in combination be

more than participants need to maintain energy balance.

Place Limits on What Food Can Be Purchased

Many food assistance programs are accompanied by rules or restrictions about what foods can be purchased or acquired through the program. The WIC program, for example, specifies quite narrowly the package of items that may be included, based on the pregnancy status and breastfeeding practice of mothers, and on the age of the infant or child. Originally, the foods in the package were chosen specifically because of the extra protein and a limited set of target micronutrients they provide. More recently, the package has been revised to consider the problem of over-nutrition as well as under-nutrition. For example, the amount of fruit juice and cheese has been reduced, the type of milk is restricted to low fat or skim milk for participants over one year old, and a new fruit and vegetable benefit has been added.

The school meals programs, similarly, include a requirement that links the meal menus to the federal government's Dietary Guidelines for Americans. However, the requirements are currently loose enough that an active debate continues about the role of these programs during this period of rising rates of childhood obesity (Ralston et al. 2008). New recommendations under consideration would require offering foods that have reduced saturated fat, are low in sodium, are rich in whole grains and include a variety of fruits and vegetables (Institute of Medicine, 2009). At the same time, calories offered would need to fall within a minimum/maximum range determined by age. Current regulations specify a minimum level of calories offered.

SNAP, by contrast, is sometimes described as if it provides no constraints on the healthfulness of the foods that can be purchased. Cigarettes and alcohol are forbidden, along with paper goods and other non-food products, but otherwise most foods and beverages in the grocery store are eligible. Early research found that program benefits were associated with increased consumption of discretionary fats and added sugars, but not significantly increased consumption of fruits and vegetables (Ver Ploeg and Ralston, 2008). While some have proposed that SNAP benefits could be restricted to a narrower list of foods, these proposals have not been able to overcome the concern that making the program more restrictive would discourage participation by eligible low-income people. SNAP does have one important food restriction, which has received more attention recently. Because the program benefits are restricted to foods that are intended for consumption at home—or at least off the retailer's premises—SNAP tends to increase grocery purchases at the expense of restaurant or away-from-home purchases (Wilde, Troy, and Rogers, 2009).

Provide Nutrition Education and Promote Healthy Eating

Nutrition education has long been a central component of the WIC program and is a required part of WIC services. Although the main activity of SNAP is to provide benefits to support food purchases, nutrition education has become an increasingly important secondary activity in state SNAP agencies. In this voluntary component of SNAP, states may propose a nutrition education plan to the federal government. Federal and state governments share the costs approximately equally. The federal contribution to nutrition education for SNAP participants grew from less than \$1 million in 1992 to more than \$270 million in 2007. In its guidance for state agencies conducting nutrition education, USDA's Food and Nutrition Service focuses on promoting specific behaviors, such as increased physical activity and increased fruit and vegetable consumption, which are associated with lower risk of obesity. Nutrition education offered through school programs in Team Nutrition and increased availability of fruits and vegetables in the school setting are designed to increase exposure to a variety of foods, promote healthy eating and, ultimately have an effect on reduced weight.

Affect Food Prices and Agricultural Markets

Food assistance programs may affect food markets in ways that have implications for all low-income consumers, participants and nonparticipants alike. The WIC program, for example, has a small farmer's market promotion program, which is designed in part to encourage healthful alternative retail options in low-income communities. Beyond these newer and small-scale efforts, the WIC purchases and rebates from infant formula manufacturers have the potential to increase the price of formula faced by non-WIC participants (Oliveira et al. 2005). Until recent changes in program benefits and formula rebates, the relative price difference in infant formula meant that the program benefit with formula feeding outweighed the program benefit received by nursing mothers and encouraged early use of formula feeding. Infant feeding practices that include increased practice and duration of breastfeeding are associated with reduced risk of

illness and excessive weight gain later in childhood.

Other large food assistance programs, such as SNAP, operate on a large enough scale they could influence the overall economic viability of full-service grocery retailers in low-income neighborhoods. Recent research contemplated more specifically the possible effects of SNAP policy changes on agricultural markets. Alston et al. (2009) investigate whether restricting SNAP benefits to comparatively healthy products could increase the price of those products, thereby affecting the purchases of low-income nonparticipants. Alternatively, expanding the market for these products and increasing market access may increase their availability in some low-income markets.

Reduce Food Insecurity and Hunger

Food assistance program participants tend to have higher rates of food insecurity and hunger than seemingly similar nonparticipants do. This finding has sometimes been called a “paradox,” but it should not really be surprising. People who face greater concerns with food insecurity and hunger are more likely to undertake the effort to participate in food assistance programs. Recent research has intensified the effort to control for this type of self-selection, in order to measure the real effects of program participation. For example, Huffman and Jensen (2008) found that when one controlled as well as possible for self-selection, it no longer appeared that SNAP participants had higher rates of food insecurity.

The relationship between SNAP participation, food insecurity, and obesity is complex. Women in moderately food insecure households tend to have higher weights on average than women in food secure households. Results are less clear for men. The reason for this pattern is not entirely clear, though being food insecure may be related to “boom and bust” cycles in food intake, which could be related to weight gain.

Alternatively, being food insecure may require households to sacrifice healthy food choices in favor of less expensive and more fattening sources of calories. Or, some other characteristic of food insecure households, such as increased stress or reduced time for physical activity, may also be related to higher weights. SNAP participation might help in some ways to ameliorate this problem, by providing a reliable source of economic resources for food purchases. However, SNAP benefits received only once per month are typically exhausted or nearly exhausted long before the end of the month—the boom and bust cycle. It would be worthwhile to test more frequent benefit delivery, on a pilot basis, to see if this change protects participants from sporadic food insecurity and improves the healthfulness of food purchases late in the month.

An Opportunity for Change

Food assistance programs do more than just provide food. They may increase resources for food spending, while at the same time providing nutrition education. They may limit purchases or regulate reimbursable foods and meals in ways that reduce the potential impact on weight gain. They may encourage healthy eating practices among children and have longer term consequences on improving food choices. They may influence food prices and food retail access in low-income neighborhoods. They may ameliorate food insecurity, or at least target resources toward the needs of people who are particularly at risk of food insecurity.

Determining whether food assistance programs have a direct or indirect effect on obesity is a complex issue. Many factors, both diet, physical, and contextual can influence the health outcome. Public programs have an opportunity to affect eating behaviors in a wide variety of ways, and at different times in the lives of participants. As new evidence emerges on food choices and eating behaviors that contribute to obesity, USDA is challenged to incorporate the evidence in designing programs that both promote healthy food choice and, at the same time, support efforts to ameliorate hunger. Despite the complexity, the challenge encourages research designed to focus more closely on the programs’ distinct goals and activities in a way that actually provides more useful information for thinking about policy improvements.

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CAN NUTRITION LABELING AFFECT OBESITY?

Joanne E. Arsenault

JEL Classifications: I10, Q18

Current estimates of obesity in the United States indicate that 68% of adults (Flegel et al. 2010) and 32% of children (Ogden et al. 2010) are overweight or obese. The incidence of obesity has risen dramatically over the past two decades. Obesity in an individual is the result of an energy imbalance in intake and output, but the cause of this imbalance on a population level is not fully understood. Changes in the food environment, including the proliferation of convenience and fast foods high in energy and fat content, have paralleled the obesity epidemic. One approach to combating obesity is to educate the public about nutrition and the nutritional components of the food they purchase. Nutrition labeling of foods sold in stores and in restaurants, when available, is designed to provide the public with information to make informed choices about food purchases. The presumption for an obesity impact is that knowledge about the calorie content of foods will motivate and/or guide individuals to consume the appropriate amount of calories for proper weight management.

Food Labeling Legislation in the United States

The Nutrition Labeling and Education Act (NLEA) of 1990, implemented in 1994, provided the U.S. Food and Drug Administration (FDA) with the authority to require nutrition labeling on packaged foods and require that certain nutrient-related claims be consistent with agency regulations. The objectives of the NLEA were to clear up confusion about label information, help consumers make healthful food choices, and encourage manufacturers to produce healthier food products. Specific nutrients were required to be listed, including calories, calories from fat, saturated fat, and sugars; and the nutrient information per serving had to be placed in the context of a daily diet. In 2003, regulation for labeling of trans fat was added.

An FDA Obesity Working Group was formed in 2003 and directed by the FDA commissioner to improve the food label and thereby assist consumers in preventing weight gain and reducing obesity. The group recommended giving calories more prominence on the food label. FDA is currently looking into 'front-of-package' nutrition labeling that consists of brief nutrient-specific information such as calorie content in a serving or a summary symbol representing overall quality. The intent is that front of package labeling is simpler and easier to understand than the Nutrition Facts Panel on the side or back of the product.

The NLEA only applies to packaged foods sold in stores, but food consumed away from home, such as in restaurants, has increased substantially during the past few decades, from 18% to 32% of total daily calorie intake (Guthrie, Lin, and Frazao, 2002). The new health care legislation, the Health Care and Education Affordability Reconciliation Act of 2010, mandates calorie labeling of foods sold in restaurant chains with more than 20 outlets and vending machines. The legislation pertains to calories, but contains a clause to include other nutrients, and stipulates that a statement must be posted regarding suggested daily caloric intake so consumers can put the information in the context of a daily diet. A timeline of nutrition labeling activities is shown in Table 1.

Table 1**Nutrition Labeling Timeline**

1990	U.S. Congress passes Nutrition Labeling and Education Act (NLEA), mandating nutrition labeling of packaged foods
1994	NLEA implemented by the Food and Drug Administration (FDA)
2003	FDA adds trans fat to label requirements
2003	FDA Obesity Working Group formed and directed to improve food labels to assist consumers in preventing weight gain and reducing obesity
2004	FDA Obesity Working Group recommends giving calories more prominence on food label and highlight enforcement of serving size accuracy on labels
2009	FDA initiates research on 'front-of-package' labeling
2010	US Congress passes Health Care and Education Affordability Reconciliation Act that mandates calorie labeling of foods sold in restaurants and vending machines

Impact of Food Labeling on Consumer Behavior

For food labeling to impact consumers' health and weight status, consumers must use the information. They must first read the label, understand the information and how to use it, and then make decisions about their food consumption based on the information. According to the 2008 Health and Diet Survey conducted by FDA, 54% of consumers reported often using the food label when purchasing a food item for the first time. There are indications of increased use of food label information in the years immediately after the implementation of NLEA. In the 1990 Health and Diet Survey, 30% of consumers said they changed their minds about buying a food product because they read the nutrition label. By the end of 1995, approximately one year after the food labeling legislation went into effect, 48% had done so (Levy and Derby, 1996). That figure has remained stable, with 49% of respondents in the 2008 survey reporting changing their minds about purchasing a product based on reading the nutrition label.

Information on nutrient content of foods alone does not necessarily affect dietary behavior. Food choices are influenced by many factors, and consumers must be motivated to use the information for their health. Awareness of diet and health relationships is an important motivational factor for dietary behavior. A USDA food intake survey conducted in the 1990's asked participants about both food intake and nutrition knowledge and found that those who were aware of health problems associated with saturated fat and cholesterol consumed less of those nutrients (Variyam, 1999).

Some studies have shown that people who are aware of diet-disease relationships use food labels to guide their food choices, and that food label use is associated with better dietary intake choices. A survey in Washington State found that belief in the importance of a low-fat diet and knowledge of the association between diet and cancer strongly predicted food label use, and that food label use was significantly associated with lower fat intake (Neuhouser, Kristal, and Patterson, 1999). In a nationally representative survey conducted in 1994-1996, food label use was associated with higher overall dietary quality as measured by the USDA's Healthy Eating Index (Pérez-Escamilla and Haldeman, 2001). More recently, individuals in the National Health and Nutrition Examination Survey (NHANES), 2005-2006, who had a chronic condition such as diabetes, hypertension, or hyperlipidemia reported reading food labels more than those without any of these conditions—71% versus 60% for the sample (Post et al. 2010). Among individuals with one or more of these conditions, those who read food labels consumed more fiber and less sugar than those who did not read labels. Another study using the same NHANES dataset reported that overweight individuals were more likely to use food labels (Lewis et al. 2009).

One objective of the NLEA was to encourage manufacturers to produce healthier food products. The NLEA

allowed for nutrition content claims on products, such as “low-fat” or “reduced-fat,” if the product met specific criteria. Considerable increases in the number and sales of fat-modified foods were documented within the year after the NLEA went into effect (Levy and Derby, 1996). However, these products are not necessarily lower in calories than similar foods with higher fat content because the fat is often replaced with sugar. Therefore, consumption of these products does not necessarily lead to lower overall energy intake.

Potential Impacts of Labeling on Health and Obesity

Impacts of nutrition labeling on health outcomes is more difficult to assess directly. When the NLEA was enacted, an FDA economic impact analysis estimated that the food label could save up to \$26 billion in health care costs over the next 20 years based on estimated reductions in heart disease and cancer due to dietary improvements (FDA, 1993). Only one study to date has since estimated an impact of NLEA on obesity and health-associated cost savings (Variyam and Cawley, 2006). The study examined data before and after NLEA from an annual national health survey, the National Health Interview Survey, which asks about food label use and body weight. Body mass index (BMI) increased over the time period and label use remained steady. However, label users gained less BMI than nonusers, although the difference was only significant among non-Hispanic white females. It is unclear why the effect was only significant among that segment of the population. The study also estimated the potential economic impact of NLEA, based on estimated benefits from reduced BMI. The estimated value of benefits of NLEA among non-Hispanic white women was \$166 billion over a 20-year period due to lower mortality risk, reduced medical expenditures, lower absenteeism, and increased productivity.

Some estimates of impacts on obesity have also been made with regard to nutrition labeling of restaurant menus. A recent study of pre and post calorie labeling of Starbucks' menu items estimated a 6% reduction in calories per sales transaction, and further projected a decrease in long-term body weight of less than 1% (Bollinger, Leslie, and Sorensen, 2010). An impact assessment in Los Angeles County estimated that restaurant menu labeling could decrease the annual weight gain of residents by 41%, based on estimates from other reports that 10% of restaurant patrons select reduced-calorie meals as a result of menu labeling with an average calorie reduction per meal of 100 kcal (Kuo et al. 2009).

Studies assessing the impact of nutrition labeling on obesity should be viewed with some caution. First, they are too few in number to make any definitive conclusions. Moreover, they are based on many assumptions often obtained from one study and extrapolated to a larger population. The optimal scientific study design would be a randomized trial where one group is exposed to nutrition labeling and a control group is not exposed, and both groups are followed over a long-term period to determine use of labeling, dietary intake, and body weight. Therefore, other factors affecting food intake and obesity would be evenly distributed among the two groups and differences in the outcomes could be attributed to labeling. It is likely that individuals with specific characteristics use labels to guide their daily food consumption, and these could be identified and accounted for in further extrapolations to predict impacts on a national population level. In reality, this type of study would not be feasible in a real world setting; therefore, observational studies of label users and nonusers in various populations that control for other factors related to label use and health outcomes should be considered.

New options for labeling, such as front-of-package and restaurant menu item calorie information, should increase consumers' awareness of their calorie consumption. Menu labeling may result in reductions in fat and calorie content of menu items through recipe modification or reduction of portion sizes served. It is hard to imagine that a consumer would not be affected to some degree by knowledge that a selected entrée contains their entire recommended calorie intake for the day. However, the effect of menu labeling on consumers remains to be seen.

One could argue that the entire U.S. population has been exposed to nutrition labeling of foods for almost two decades and obesity is rising. Likewise, if obesity starts to decrease after mandatory menu labeling goes into effect, this does not infer causality. There are many other factors influencing obesity and a wide variety of efforts are being undertaken to tackle the obesity problem. Nevertheless, nutrition labeling of foods and menu items is important because the consumer has a right to know what they are purchasing and consuming. Some motivated consumers will use information on the label or menu to guide their food choices. At the population level, nutrition labeling is just one of many efforts that will be needed to combat the obesity epidemic.

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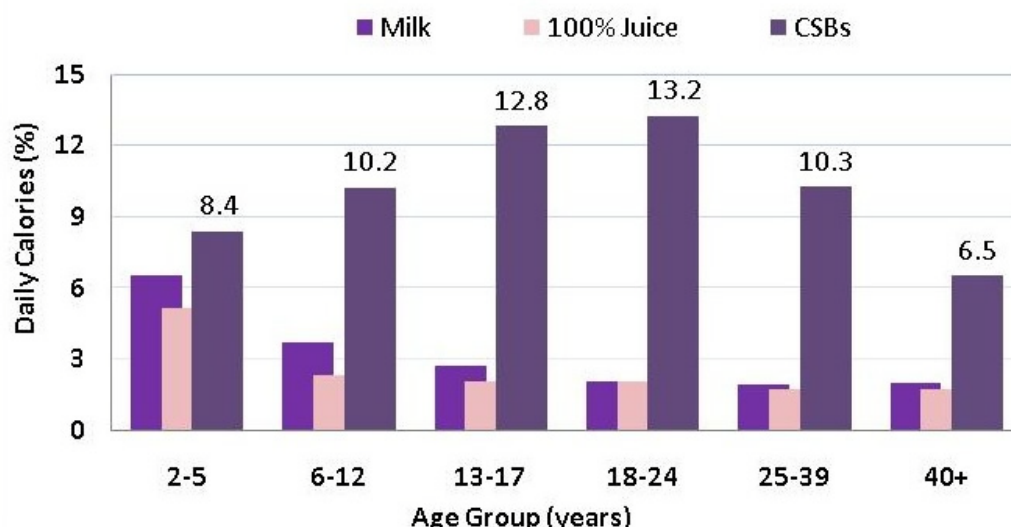
CAN TAXES ON CALORICALLY SWEETENED BEVERAGES REDUCE OBESITY?

Jessica E. Todd and Chen Zhen

JEL Classifications: D12, H2, I18

Enlightened by the success of using tobacco taxes to curb smoking prevalence, many have argued that large beverage taxes are an attractive policy tool in the fight against obesity because, unlike many other foods, calorically sweetened beverages (CSBs) have little nutritional value. However, unlike tobacco which is harmful at any level of consumption, CSBs may be consumed in moderation as part of a healthy diet. In the United States on average, CSBs make up a large share of total daily calories—about 13% for adolescents and young adults (Figure 1). Thus, reducing the consumption of CSBs may substantially reduce caloric intake, as long as individuals do not compensate by adding calories from other foods or drinks.

Figure 1: Percentage of Daily Calories from Various Beverage Types by Age Group
Source: Authors' tabulations using 2003-2006 National Health and Nutrition Examination Survey data



Existing studies of beverage demand establish that, consistent with economic theory, households do reduce the quantity of CSBs purchased in response to higher prices (Andreyyeva, Long, and Brownell, 2010; Smith, Lin, and Lee, 2010; Finkelstein et al. forthcoming), which suggests that a tax-induced large increase in shelf price may be effective at reducing caloric intake. The question is how large of a tax—and in what form—is needed to cause a noticeable decline in the prevalence of overweight and obesity? An emerging body of economic research has attempted to address this question. Much previous research has referred to beverages sweetened with sugar or corn syrup as sugar-sweetened beverages. We refer to these drinks as CSBs to more accurately reflect the fact that not all contain sugar.

Although some claim that a 10% tax on CSBs would likely "...be the single most effective measure to reverse

the obesity epidemic" (Frieden, Dietz, and Collins, 2010, p.358,), a closer look at current consumption patterns and prices suggests that getting Americans to exchange CSBs for healthier low-calorie beverages or to reduce consumption of CSBs will probably take more than just a 10% tax.

CSBs—including fruit drinks, energy drinks and sweetened coffees and teas—are on average more expensive than lower calorie beverages such as diet soft drinks, bottled water, and unsweetened coffee and tea (Table 1). Yet, despite higher prices, almost all Americans consume CSBs and less than half report consuming many low-calorie alternatives (Figure 2). Fewer than 50% in all age groups report consuming any water—bottled or tap—and, except for unsweetened coffee and tea among adults age 40 and up, even fewer consume diet drinks or other low-calorie beverages.

Table 1

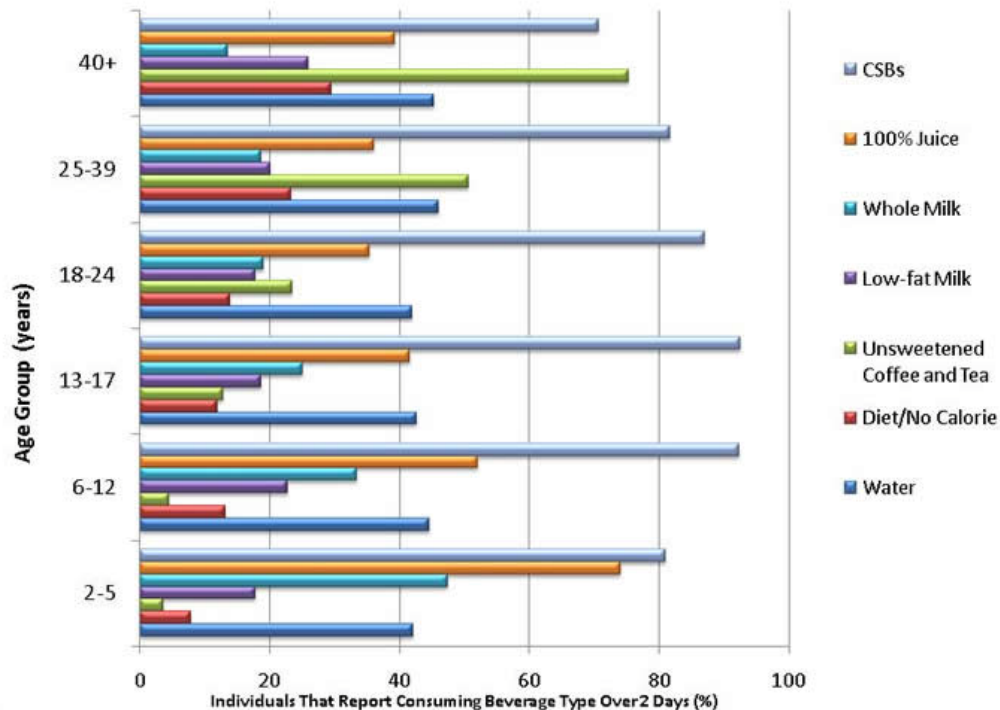
Average Price per Gallon of Various Beverages, First Quarter 2006

	\$/gallon
100% juice	6.39
Whole milk	5.45
CSBs	4.33
Low-fat milk	3.37
Diet soft drinks	3.07
Bottled water	2.31
Coffee/tea	2.09
Tap water	0.003

Source: Authors' calculations using the 2006 Quarterly Food-at-Home Price Database (Todd et al. 2010)

Notes: CSBs include carbonated soda, noncarbonated fruit and sports drinks, sweetened coffees and teas, and flavored milk

Figure 2: Percentage of Individuals that Report Consuming Each Beverage Type by Age Group
Source: Authors' tabulations using 2003-2006 National Health and Nutrition Examination Survey data
Notes: consumption is over two days; water includes bottled and tap water; CSBs include carbonated soda, noncarbonated fruit and sports drinks, sweetened coffees and teas, and flavored milk.



What Should be Taxed and How?

Throw Out the Sales Tax

Many states currently have special sales taxes on carbonated beverages—33 states in 2008 (Bridging the Gap, 2009). Such taxes are effective at generating revenue, but research shows that they have had little to no effect on overweight or obesity for adults or children (Powell, Chriqui, and Chaloupka, 2009; Sturm et al. 2010; Fletcher, Frisvold, and Tefft, 2010).

It is not surprising that sales taxes would have little effect on weight. First, the rates are quite low, averaging only 5.1% per taxing state (Bridging the Gap, 2009). Second, consumers may not be aware of the taxes given that sales taxes are not apparent on shelf prices. Purchase receipts generally only report the total sales tax paid, not the sales tax on each item. According to classic economic theory, assuming competitive markets and rational consumers, a sales tax should elicit the same consumer response as other forms of taxes of commensurate magnitude, and the economic incidence of the tax is the same whether it is levied on the producer or consumer. However, recent evidence suggests that consumers may not be aware of sales taxes on items in grocery stores when they are not included in the shelf price, and that the economic incidence of the tax may be dependent on whether the tax is imposed on the manufacturer, retailer, or consumer (Chetty, Looney, and Kroft, 2009).

Tax All Beverages with Added Caloric Sweeteners

Most current state sales taxes are applied on both caloric and diet carbonated beverages, but not on other calorically sweetened beverages such as noncarbonated fruit drinks, sports drinks, flavored milk, or sweetened coffees and teas. Consumers may avoid the tax by substituting these untaxed drinks for taxed carbonated beverages and consume the same amount of calories. Some states and localities, such as New York, have excluded or are considering excluding diet drinks and bottled water, in part to help gain industry support for the tax (Berger, 2010).

To increase effectiveness in inducing behavior change, a beverage tax should cover all types of calorically sweetened beverages, including sports drinks, flavored teas, and blended coffees. These noncarbonated beverages are increasingly popular beverages and also have a significant amount of calories per serving. Of course, consumers may increase intake of other sources of added sugar, such as cakes, cookies, and other nonbeverage sweets if these non-beverage foods become relatively cheaper in the presence of a large beverage tax.

Consider an Excise Tax

Brownell et al. (2009) recommend a very specific tax on beverages with added caloric sweeteners—an excise tax of 1 cent per ounce. Such a tax differs from a sales tax in that the manufacturer or distributor would be responsible for paying the tax, but most importantly, part or all of the tax would be passed through as an increase in shelf prices. Chetty, Looney, and Kroft (2009) find that consumers respond less to a sales tax than they do to a tax that is included in the shelf or posted price for beer. Thus, an excise tax on CSBs may elicit a larger change in behavior than a less-apparent sales tax.

How Much to Tax?

How large of a tax is necessary to have a noticeable effect on body weight such that the prevalence of overweight and obesity is reduced depends on how responsive consumers are to increasing prices—that is, the consumer price elasticity—and how a decrease in consumption of CSBs will decrease total calories consumed, and ultimately result in weight loss.

How Responsive Are Consumers to the Price of CSBs?

Studies that examined only carbonated soft drinks find that a 10% increase in price will reduce quantities purchased by about 8% to 10% (Andreyeva, Long, and Brownell, 2010). More recent research that considers all caloric sweetened beverages suggests that consumers may be more responsive to price. Smith, Lin, and Lee (2010) find that a 10% increase in price would reduce household purchases from grocery stores and similar outlets by about 13%. Assuming the same percentage change in intake for adults and children, they estimate that a 20% increase in the price of CSBs would decrease energy intake on average by 34 calories per day for adults and 40 calories per day for children. These daily calorie reductions could translate into a short-term decrease of up to 3.6 pounds of body weight in a year for adults and up to 4.2 pounds per year among children under the simplified assumption that a pound of fat tissue results from about 3,500 kilocalories (kcal).

One drawback to the study by Smith, Lin, and Lee (2010) is that the percentage changes in consumption for adults and children are assumed to be the same and equal to the estimated percentage changes in household-level purchases from grocery stores. Given the differences in consumption patterns between adults and children (Figure 2), it is possible that price changes will affect adults and children differently. Moreover, not all food and beverages are consumed at home, so estimates based only on purchases from grocery stores or similar outlets may overstate the actual change in consumption (Smith, Lin, and Lee, 2010).

Preliminary work by Todd, Leibtag, and Mancino (2010) uses individual consumption data from the 2003-2006 National Health and Nutrition Examination Survey and prices from the Quarterly Food-at-Home Price Database (QFAHPD) to estimate how responsive children and adult beverage consumption is to changes in prices. They find that children's consumption is more responsive to price than adults, indicating that a beverage tax may help fight obesity among children more than among adults.

How Much Will a Tax Really Affect Obesity?

To reduce obesity and overweight, a tax on CSBs will need to result in a decrease in total caloric intake. In response to higher CSB prices, individuals may reduce calories from CSBs, but compensate by increasing caloric intake from food. Ultimately, the net effect on total caloric intake is an empirical question. Research has found that existing sales taxes have not had much effect on Body Mass Index (BMI) or overweight and obesity (Powell, Chriqui, and Chaloupka, 2009; Sturm et al. 2010; Fletcher, Frisvold, and Tefft, 2010), but this is probably due to the fact that existing sales taxes are small in magnitude and hence do not affect

consumption very much.

Wendt and Todd (2010) look directly at how prices for various beverages affect children's BMI using the Early Child Longitudinal Survey Kindergarten Class (ECLS-K) and prices from the QFAHPD. They find that an increase in the price of soda and fruit drinks can reduce children's BMI, but significant weight reductions take at least one year to appear. A 10% increase in the price of soda would reduce BMI by 0.3% after one year and the same change in the price of fruit drinks would decrease BMI by 0.2% on average for children five to 12 years old. Relatively rough estimates using 2003-2006 NHANES data indicate that a 20% increase in the price of soda would reduce the incidence of at-risk for overweight—BMI greater than the 85th percentile for age and gender—by about 0.5 percentage points and the incidence of overweight—BMI greater than the 95th percentile for age and gender—by about 0.1 percentage points after one year among children five to 12 years old. We would expect that the effects would be larger if the tax covered all caloric sweetened beverages.

Smith, Lin, and Lee (2010) estimate larger effects. A 20% tax on all CSBs would reduce obesity among adults by three percentage points and overweight in children by 5.3 percentage points. However, their estimates likely overstate the potential impact because they assume intake declines as much as household purchases from grocery stores decrease in response to the tax. Finkelstein et al. (forthcoming) estimate more modest effects on weight—declines of about one pound per person from a 40% tax on all store-purchased CSBs. Using 2003-2006 NHANES data, we find that a weight loss of one pound per person age two years and up would decrease the incidence of obesity among adults 20 and older by 0.6 percentage points and overweight among children by 1.1 percentage points.

Distributional Issues?

Taxes on food are generally regressive, so policy makers will also need to consider how a tax affects low income households. Three studies have examined the potential distributional effect of large beverage taxes across income strata. Finkelstein et al. (forthcoming) investigated the tax burden of large CSB sales taxes on households across income quartiles. Their results indicate that high-income households may bear a larger share of the total tax incidence, because high-income households purchase more branded beverages relative to low-income households who purchase more lower-cost generic drinks. In contrast, Zhen et al. (2010) and Lin, Smith, and Lee (2010) find that low-income households would pay a slightly larger share of a CSB beverage tax.

Should We Do It?

Research suggests that beverage taxes, even when relatively large—40%—will have only modest effects on weight and the incidence of overweight and obesity within one year. However, over a longer time horizon, greater declines in obesity could be achieved as American's get out of the habit of consuming CSBs. Zhen et al. (2010) find that consumption of CSBs is habit forming, but not more so than milk. Whether or not calories from other foods, such as cookies, chips, or other "junk food," will fill the void left from decreasing consumption of CSBs is still largely unknown. Future research should examine consumer substitutions between junk beverages and foods.

There is no question that a tax on CSBs will raise billions of dollars in tax revenue. If this money is used to help fund other obesity-reduction programs such as consumer nutrition education, the tax may be more effective than being used as a way to increase the monetary cost of consumption alone. One concern is that a large tax may hurt very low-income households, particularly those that struggle to afford enough to eat and rely heavily on CSBs as a cheap source of calories. Rising prices, even for beverages that do not meet nutritional needs other than calories, may have unintended negative effects on nutrition, particularly among low-income households.

Unlike second-hand smoke, the externality of obesity is primarily reflected through increased Medicare and Medicaid expenses. CSBs can be consumed in moderation as part of a healthful diet. A tax on all consumption penalizes those who drink these beverages in moderation.

Given that on an average day nearly 90% of the population consumes some amount of CSBs, we wonder about the political economy of a large excise tax. How likely will such large taxes be passed when over 90% of the population consumes some amount of CSBs? Attempts to pass a large CSB tax in New York State

have failed twice, but per-can taxes have recently passed in Washington and Baltimore. Time will tell whether such taxes will be repealed or whether they will gain in popularity and acceptability.

It is important to remember that any tax on a specific food or group of foods can only address one small aspect of the obesity epidemic. Excessive weight is determined by caloric intake and caloric expenditure. Diet choices are the result of a complex set of household and individual decisions, reflecting not only economic factors but also social and cultural norms. Physical activity, the other side of the energy balance equation, is not likely to respond to changes in food prices. Thus, taxing CSBs may be one part of a multi-sectoral approach to tackling the problem.

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BEHAVIORAL ECONOMICS: A NEW HEAVYWEIGHT IN WASHINGTON?

Sean B. Cash and Christiane Schroeter

JEL Classifications: I12, I18, C9

Economists are hardly a rare sight in Washington, D.C. but the toolbox of beltway economists has become a little bit fuller during recent years. The insights of behavioral economics have increasingly moved from research journals and classrooms into policy discussions and the popular media. The topic's rapid ascendance into the public sphere is evident in workshops hosted by federal agencies, a best-selling book on the application of behavioral economics, and op-ed pieces in major newspapers.

Neoclassical or traditional economics is based on models about how people should behave when acting in their own best interests. Empirical observations are then fit to these models. In contrast, behavioral economics has been based primarily on observations of how people do behave. This new stream of thought has focused in large part on how individual behaviors deviate from the predictions of more traditional economic approaches. To accomplish this, behavioral economics utilizes a set of tools drawing on approaches from both psychology and economic decision models. Much of the literature in behavioral economics boils down to two main results. The first is that people use heuristics, or rules of thumb, to make choices in a wide variety of settings. Second, these heuristics often lead to errors, in the sense of outcomes that are suboptimal from the viewpoint of a self-interested decision maker. These errors, however, are generally predictable through both observation and understanding of the decision rules employed.

Dieting is a useful example to illustrate the differences between the two approaches. Many people do not think their future health is based on their present food choices. A traditional economics approach, based on assumptions of perfect information and maximization of utility or personal well-being, would explain this behavior as being evidence of people not valuing their future much. After all, dieting involves giving up some enjoyment today in order to have a better tomorrow. While discounting of future outcomes is certainly an important part of the story, it does not fully explain individual behavior. When asked, many people would say they do care about their future health more than their actions seem to indicate and that they actually would like to make better food choices. By their own reckoning though, they are failing to meet their goals. Behavioral economics seeks to explain the phenomena that would cause these individual shortcomings. Such errors might have played an important role during the recent obesity crisis, which is a large part of why behavioral economics became such a hot topic in Washington.

Could Behavioral Economics Improve Health-Promoting Policies?

Diets that are suboptimal from a health point of view may still reflect rational choices, as people may willingly give up some of the joys of a supersized plate of nachos today for a little of tomorrow's good health. But one needs to look no further than the existence of a multi-billion dollar weight loss industry for evidence that these are not deliberately chosen outcomes for many people. By our own standards, many of us would strive to make different choices from the ones we do in real life.

What heuristics might help explain such errors? Status quo bias may play a large role. People tend to stick with their current course of action, particularly when a change is costly. This is true whether the costs are paid in money or mental effort. When it comes to food choices, research has shown that we also rely heavily on subtle external cues or nudges that influence what and how much we eat (Thaler and Sunstein, 2008).

Rather than calculating the expected health outcomes, impact on appetite, and enjoyment of eating another mouthful of our food, we tend to eat until our plates are empty. In lab experiments with soup bowls that were refilled automatically without the knowledge of the participants, behavioral researchers determined that individuals ate 73% more than from a normal bowl (Wansink, 2006). Instead of searching through a restaurant menu for the meal that best balances our hunger and dietary desires, we are more likely to order items that are prominently placed on the menu—but only if someone at our table did not order the same item. In short, the framing of our options influences the choices we make.

How does all this relate to the business of government? Such findings suggest there may be large payoffs to making small changes depending on how options are presented. If employers change the default options for new employees to participate in a retirement plan unless they opt out, people save more than if the default is to not contribute unless you opt in. This default option does not restrict anyone's freedom of choice regarding savings, and can lead not just to greater individual savings but also lower costs to social assistance programs. Similarly, research has shown that people tend to make healthier food choices when asked to choose in advance than they often do in the "heat" of a restaurant visit or grocery-shopping trip, where external cues or sensory input are more likely to favor energy-dense or attractively packaged foods. If food assistance programs required participants to choose foods in advance, they might similarly make choices that lead to healthier diets.

Changing the position of items on a restaurant menu or in a take-away food display can alter the type as well as amount of foods purchased and consumed without limiting the individual food choice. This focus on influencing individual outcomes towards social goals has come to be known as choice architecture and using such behavioral nudges to improve outcomes has been termed libertarian paternalism. The approach is libertarian in that it can shift individual behavior without limiting freedom of choice, but it is paternalistic in that it inevitably involves some judgments about what those best outcomes should be. Thaler and Sunstein (2008) suggest that the paternalistic elements are most appropriate and politically acceptable when they reflect the outcomes that people want for themselves.

Cass Sunstein, a legal scholar and leading proponent of behavioral economics, is now the Administrator of the Office of Information and Regulatory Affairs, the unit in the Office of Management and Budget that is in charge of reviewing and approving the major regulatory actions of all other agencies. In this position, commonly referred to as the "Regulatory Czar," he has the opportunity to utilize his knowledge of behavioral economics when evaluating the efficacy and value of a wide variety of government actions. With specific regard to obesity, these insights may shed light onto both the opportunity to exploit heuristics for low-cost improvements to our diets and the limitations of new food policies that seek to influence rational choice.

The Limits of Menu Labeling

One of these new food policies is the mandate regarding menu labeling. This policy addresses the call for more information about the foods we are consuming. Since 2007, chain restaurants in New York City have posted the calorie content of each food item next to its price on menu boards. During the fall of 2008, California started requiring menu labeling in restaurants with more than 20 outlets. However, studies have shown that increasing nutrition information alone may not be efficient in promoting healthier food choices. While providing calorie information might have some small positive effects on the food choices of some dieters, it might affect others negatively by leading them to increase their calorie consumption.

In the neo-classical economic framework, individuals should use the menu labeling information to choose a healthy meal that will maximize their future well-being. However, behavioral economists point out three reasons why improving access to information might not promote healthier food choices. First, individuals tend to overeat due to self-control problems and menu labeling is not able to address this issue. Second, this information provision could actually distract an individual, since people have only a limited attention span to digest information. Thus, consumers might not have the ability or time to compare menu label information. Third, dietary information could produce perverse effects on calorie consumption, such as promoting higher calorie intake. A subset of consumers might over-estimate calorie contents and thus seek low-calorie food and beverage options in order to lose weight. However, by viewing the accurate nutrient information in restaurants, these dieters might recognize their over-estimation and adjust their food choice to a higher-calorie meal.

Downs, Loewenstein, and Wisdom (2009a) showed that such perverse outcomes are not just theoretical possibilities. They collected sales receipts of consumers who left either a coffee shop or two outlets of a

hamburger restaurant in New York. In addition, the researchers provided the suggested calorie intakes per day or per meal to randomly selected individuals entering these three restaurants. This information was intended to help diners make use of the posted calorie information (Downs, Loewenstein, and Wisdom, 2009b). Sales receipts showed that this information led to an unwanted effect on some consumer's calorie consumption, since dieters significantly increased their calorie intake relative to nondieters.

Big Changes at Low Cost?

Various results from behavioral economic experiments can help to shape low-cost yet effective health policies. Such studies have observed children and students in lunchrooms, consumers in grocery stores, or families in a laboratory setting. These findings suggest that fairly simple and inexpensive changes can lead to substantial differences in dietary behavior. Moreover, even small changes in diets can yield meaningful effects if sustained over long periods of time.

A particularly promising line of research centers on the impulse purchases of chips, desserts, and candy that often occur at the check-out of lunchrooms or grocery stores when waiting in line for the cash register. In order to promote healthy food choices, restaurants, cafeterias, and supermarkets could replace these high-calorie food options with a variety of fruits. Just and Wansink (2009) highlight some of the opportunities for positive change in school lunchrooms. When school cafeterias placed fruit at eye level at the check-out and candy at more obscure places, the consumption of fruit significantly increased while consumers purchased less candy. In addition, offering a variety of low-calorie foods will further increase the consumption of these food items. Thus, a salad bar could be moved to increase its accessibility. In addition, the presentation of healthier food choices might be improved by adding more lights or changing the displays. High-calorie foods should not be eliminated completely from the menu, given that these items typically form an important source of revenue for the food service providers and retailers, and removal of these items may cause students to rebel.

Ehmke et al. (2008) analyzed family decision processes related to food consumption and exercise. Parents with higher body mass indices (BMIs) tend to give their children more money to spend on junk food. In the lunchroom setting, this problem could be addressed by restricting the use of prepaid debit cards to healthier foods (Just and Wansink, 2009). At home, families should focus on the negative effects of their current lifestyle, which means giving something up in their current unhealthy lifestyle in order to achieve a "culture of health." Behavioral research suggests that this "culture of health" is easier accomplished by giving up unhealthy lifestyle choices instead of focusing on adding in more healthy ways of life (Ehmke et al. 2008).

Promise and Pitfalls of Behavioral Economics

Nudges look like promising tools in the fight on obesity. These behavioral economic approaches might be relatively cheap, flexible, and easy to implement, as they are often based on simple tweaks of existing food programs (Just and Wansink, 2009). These actions might impose some cognitive but no material cost to the consumer (Thaler and Sunstein, 2008).

Clearly, there are pitfalls of behavioral economic instruments. Nudges are not mandates and they will never lead to 100% compliance among consumers. There will always be individuals who continue to choose a high-calorie food option over the healthier alternative. Placing the high-calorie food at some disadvantage in the marketplace might lead to a significant reduction in its consumption but it will not eliminate its consumption. The only way to achieve full compliance among consumers is to eliminate the high-calorie food items from the marketplace all together (Just and Wansink, 2009; Thaler and Sunstein, 2008). But given that such mandates are both politically unlikely and involve real restrictions in consumer freedom, choice-preserving nudges are very attractive tools.

There are also some concerns that experimental results may not translate into effective practices and results, as most of these behavioral economic studies only observe the impact of manipulating one single meal. It might be possible that consumers will compensate for their observed food choice later during the day by consuming more or fewer calories (Downs, Loewenstein, and Wisdom, 2009b). While cafeteria studies have shown that the amount of healthy foods sold in that setting can be increased by rearranging the sales line, we still do not know much about what types of consumers are changing their behavior more readily. Thus, the responses may be muted for at-risk groups which would be of most interest when designing health policy options. Specific experiments that are targeted towards at-risk groups could be conducted in lab settings, but

one might argue that consumers may behave differently outside of this closed environment.

Reducing obesity rates, particularly among children, has become an important part of the policy agenda in Washington, D.C. Policymakers interested in finding solutions to improve food policy have been focusing on behavioral economics. In April 2010, the Economic Research Service of the U.S. Department of Agriculture held a two-day conference on how behavioral economics can improve federal food policy. This fall, the agency will announce the funding of a university-based research center on behavioral and experimental economics methods. These activities show that the expectations for behavioral economic tools in finding constructive solutions are high, as the potential payoff to public health is large.

Indeed, these high expectations have even begun to cause concerns among some of the leading practitioners of behavioral economics. In a recent *New York Times* column, Loewenstein and Ubel (2010) caution policy makers against relying on behavioral economics instead of facing “painful but more effective solutions rooted in traditional economics.” They argue it will still be necessary to implement some additional changes to the agri-food system in order to achieve public health goals. Even if nudges alone are not enough to trim our waistlines and health care budgets to the desired level, they may nonetheless be an important ingredient in the recipe for a healthier society.

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