

20. The Obesity Epidemic--What it Means for Agriculture

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Abstract/Summary

Many people have concluded that there is a major obesity problem in the United States. Some people have also suggested that agricultural policy is one of the causes of obesity. This paper looks at issues associated with obesity including how it is measured for individuals, how prevalent it is in the country, how it has changed over time and what some have suggested are causes of obesity. In addition, agricultural policies are reviewed and connections to the obesity problem explored along with potential implications for U.S. agricultural producers.

The Obesity Epidemic—What it Means for Agriculture

By

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Abstract

The recent rise of obesity in the United States is of great concern. Some people have suggested that agricultural policy is one of the causes of obesity. This paper examines issues associated with obesity including how it is defined, its prevalence, the change over time, and different factors contributing to the “cause” of obesity. In addition, agricultural policies are reviewed related to their impact on obesity. Finally, the paper discusses the potential implications for U.S. agricultural producers.

Introduction

Two main issues make this a relevant and timely topic to be considered in an agricultural setting. First, many people are alarmed by what they perceive to be an obesity problem. As a consequence, they are looking for who or what caused the problem. (It is never a good idea to be selected as the cause of a problem!!!) Some look at agriculture, or government policy towards agriculture as one of the root causes of the problem. The following quote illustrates this kind of thinking. The quote comes from the Manhattan Mercury May 27, 2009, reprinted from the Boston Globe.

"The continuation of the status quo (in farm programs) has massive implications, from driving out small farmers precisely when Americans are demanding healthy local produce, to mindless production of processed foods fueling the nation's obesity epidemic."

A second reason for looking at obesity right now is that health care is a major focus of the current administration. One of the biggest concerns facing the health care system is how it will be paid for. Therefore, it is quite important to make sure that everyone understands the workings of agricultural policy and its relationship to obesity. Given the current situation, it is possible that people might look at agricultural policy as both a cause of the obesity problem and a source of funds with which to help pay for health care (and therefore obesity-related illnesses) for the nation.

The Wall Street Journal reported on May 12, 2009 that senate leaders were considering a new federal tax on soda and sugary drinks to help pay for the overhaul of the nation's health care system. The article states that proponents of the tax cite research showing that consuming sugar-sweetened drinks can lead to obesity, diabetes and other ailments. They say that the tax would lower consumption, reduce health problems and save medical costs, and that at least a dozen states already have some type of taxes on sugary beverages. In response to this article, a letter to the editor suggested the following.

"Instead of a tax on soda and other sugary drinks, it would be more efficient to eliminate the federal corn subsidies that encourage farmers to produce much more corn than the market would otherwise dictate. We can reallocate those subsidy expenditures to health care, allow corn syrup supplies to drop and prices of the related foods and drinks to rise. Hopefully, higher prices would deter consumers from buying these junk foods without the waste of excise tax collections."

This topic even appears in comic strips.

TUESDAY, JUNE 30, 2009



Concerns about the obesity epidemic are widespread, as illustrated by coverage on the NBC Today show on 7/2/09. There was discussion of the obesity problem and toward the end of the discussion participants agreed that they did not know what the solutions were, but concluded they were extremely discouraged and worried about the situation. One participant suggested that “the food system is broken—we have plentiful, but bad food—and the system is controlled by a few big companies.” The participant concluded by raising the issue of whether or not the U. S. could remain a world power if we (the people in the U. S.) are this unhealthy!

Descriptions of the epidemic

According to the World Health Organization (WHO), obesity is defined as “abnormal or excessive fat accumulation that may impair health” (WHO 2006). Obesity is ultimately a result of a simple accounting problem: energy intake is greater than energy output. Food is the source of energy, and it is measured in calories. An energy imbalance within the body results in either weight loss or gain. Approximately 3,500 calories of surplus energy, through increased calorie consumption (eating more) or decreased energy expenditure (exercising less), is equivalent to one pound (0.46 kg) of adipose tissue (McArdle, Katch and Katch 1999).

Obesity is measured by Body Mass Index (BMI), which is defined as the ratio of the individual’s weight in kilograms to their height in meters squared (kg/m^2) (WHO 2006; US DHHS 2001; NIH 1998). An individual is classified as being overweight when their BMI is greater than or equal to 25 and is obese when their BMI is greater than or equal to 30. The measurement’s popularity is based on the fact that it is easily obtainable (i.e., only height and weight measurements are needed) and is highly correlated with adiposity (amount of fat tissue in the body) (Hubbard 2000).

While the BMI is used extensively as a measure of obesity, it is not perfect. The disadvantage of using BMI is that it is a rough estimation of a person’s body composition (WHO 2006; Cawley and Burkhauser 2006). For example, BMI overestimates the abundance of adipose tissue (i.e., fatness) among those individuals that are muscular (US DHHS 2001; Prentice and Jebb 2001). As a result, the BMI measurement would classify some physically fit individuals (e.g., professional athletes) as being overweight or obese. For this reason, its predictive power for determining obesity in individuals is

suspect (Cawley and Burkhauser 2006). On the other hand, in 1990, Smalley *et al.*, conducted a study to test the accuracy of the BMI measurement by comparing individuals defined as being obese by BMI standards with those determined to be obese by measurements of body fat. Results indicated that BMI only correctly estimated 44.3% of obese men and 55.4% of obese women. In other words, many truly obese men and women are classified as being non-obese, which means that the BMI may severely underestimate the prevalence of the obesity. The BMI measurement can also result in false positives. As mentioned above, the BMI does not distinguish between muscle and body fat. In the Smalley *et al.* study, false positives represented 9.9% of non-obese men and 1.8% non-obese women. Furthermore, the BMI measurement does not indicate the regional fat distribution within the body nor does it measure fitness or heart rate, which are three important factors related to disease and mortality (Hubbard 2000). The severity of the health concern associated with excess adipose tissue depends on the type of adipose tissue accumulated within the body. Accumulation of visceral adipose tissue (i.e., tissue that is located around the organs) is considered to be more of an immediate health concern than subcutaneous adipose tissue (i.e., tissue located under the skin) (Albu, Kovera and Johnson 2000).

Although BMI is not perfect, the increase in the number of people registering as overweight and obese with this measure is quite alarming. In the US, 2 out of 3 adults are overweight or obese! Obesity is a major concern for public health officials. The proportion of the population that is overweight/obese is one indicator used to assess the nation's health status by the US Department of Health and Human Services (US DHHS 2000). The prevalence of obesity has risen rapidly in recent years. Data collected from several National Health and Nutrition Examination Surveys (NHANES) is depicted in Figure 1. Based on the figure, the prevalence of obesity in the US has increased dramatically from 1960 to 2004, with the prevalence of obesity in men increasing from 10.7% to 30.2% and from 15.7% to 34.0% in women.

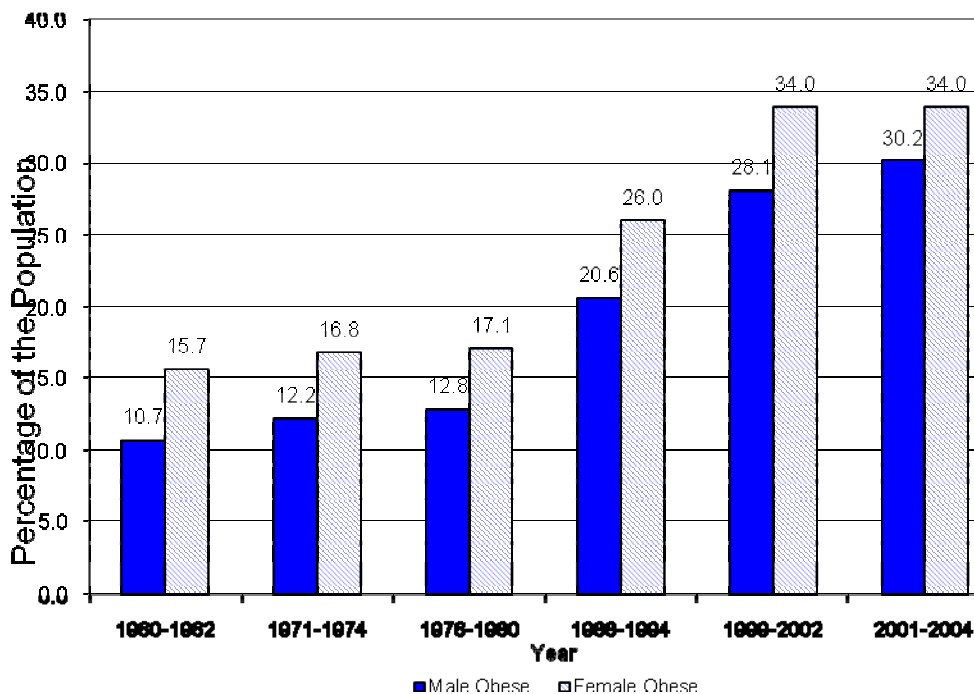


Figure 1: Age-Adjusted Prevalence of Obesity (BMI ≥ 30) for ages 20-74 years.

Source: NCHS (2006)

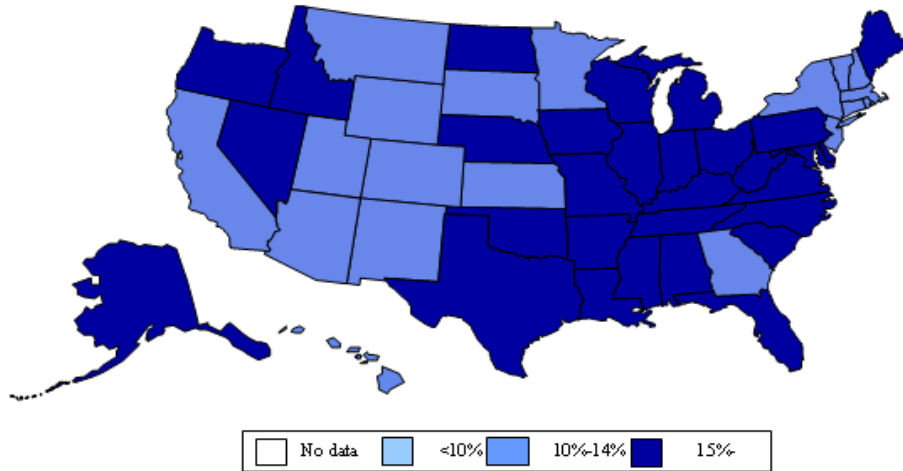


Figure 3: Obesity* Trends Among U.S. Adults BRFSS, 1996 *BMI=30 or ~30lbs. overweight for 5'4" person

Source: CDC Behavioral Risk Factor Surveillance System

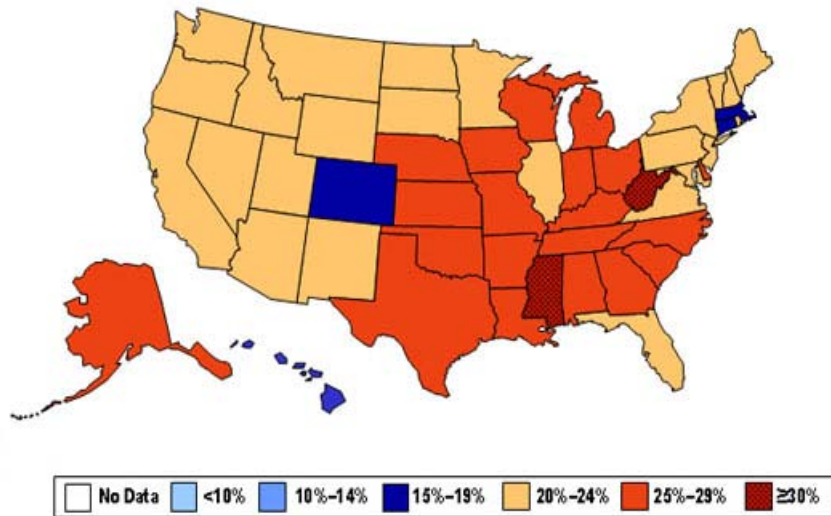


Figure 4: Obesity Trends Among U.S. Adults BRFSS, 2006 *BMI=30 or ~30lbs. overweight for 5'4" person

Source: CDC Behavioral Risk Factor Surveillance System

Obesity, Health Conditions and Economic Costs

Numerous scientific studies have explored the effects of obesity on human health. According to the literature, morbidity for a variety of health conditions increases as BMI increases. These health conditions include high blood pressure, high cholesterol, heart disease, stroke, type 2 diabetes, gallbladder disease, osteoarthritis, sleep apnea, depression, and some types of cancers (endometrial, breast, prostate, and colon) (WHO 2003; US DHHS 2001).

The concern surrounding the increasing prevalence of obesity focuses on the risk for developing these health problems and the economic costs associated with them. There are both direct and indirect costs related to obesity and its health conditions. Direct costs consist of preventive, diagnostic, and treatment services related to obesity, while indirect costs include morbidity and mortality costs. The CDC defines morbidity costs as the value of income lost due to decreased productivity, restricted activity, absenteeism and bed days. Mortality costs represent the loss in future earnings due to premature death. In terms of personal and societal loss, the indirect costs may have a greater impact than the direct costs.

A landmark study of the medical cost associated with overweight and obesity in the US was conducted by Finkelstein, Fiebelkorn and Wang in 2003. In their study, they developed estimates for medical costs based on primary data sets from the 1998 Medical Expenditure Panel Survey and the 1996 and the 1997 National Health Interview Survey. From their results, they estimated that 9.1% of the total US medical expenditures in 1998 were attributed to overweight and obesity; which translates into \$78.5 billion dollars (\$92.5 billion in 2002 dollars). Approximately half of these expenses were paid by Medicare and Medicaid insurance programs. In 2003, the estimated medical expenses attributed to obesity alone, was \$75 billion (Loureiro). The most recent estimates from Finkelstein, Togdon, Cohen and Dietz are that the medical costs of obesity could have risen to \$147 billion per year by 2008. Obesity now accounts for 9.1% of medical spending, up from 6.5% in 1998 due largely to the fact that obesity rates grew 37% between 1998 and 2006. Across all payers, their research indicates that medical spending was \$1,429 (42%) greater for obese people than spending for normal-weight people in 2006.

While a great number of individuals are quite alarmed and concerned about the huge increase in the number of obese people, there are some who question how seriously health and death rates are influenced by being obese. Some studies have found that only the morbidly obese were at increased risk of death. The problem in studying relationships between obesity and death rates and health problems is that most of the studies identify that obesity and health problems are associated with each other, but that does not prove that obesity is the cause of the health problem. It may be that other factors are the direct cause. In many obesity studies, other factors that may contribute to the development of these diseases (smoking, genetics, exercise) are not taken into consideration. This suggests a need for additional research that identifies the causes of the many diseases associated with being obese.

Causes of the Obesity Epidemic

Scientists are working hard to determine the specific causes of the obesity “epidemic”. The topic of obesity is a major issue in world health circles and professionals from many disciplines have been involved. Nutritionists, psychologists, biologists, economists, food scientists, and health care professionals are just some of the people interested in learning more about the causes of obesity in order to help inform citizens and formulate policies that will lead to a healthier lifestyle. While at the most basic level, obesity is caused by a disruption in energy balance, the reasons for this are many.

Drewnowski and Darmon reported that scientific research suggests that obesity is caused by the following: excessive consumption of protein, starch, sugar, and fat; by caloric and noncaloric sweeteners; by meals and snacks; by beverages and by solid foods; by eating in fast-food and in full-service restaurants, as well as by eating at home. Only vegetables and fruit have not been linked to higher obesity rates as yet. This list, while extensive, is not exhaustive. Other things that contribute to obesity include brain activity (both regulating feelings of hunger and the rewarding aspects of eating tasty food), the cost of food, food environment, urban sprawl, a growing market for convenience snacks and meals, an increase in sedentary activities, higher intake of fats and sugars, larger portion sizes, and changes in technology are just some of the things that have been linked to the rise in obesity throughout the world. Specifically, in the U.S. a majority of the blame is often attributed to fast food, a busy lifestyle with little or no time to prepare food, and the lack of physical activity in our regular routines. In addition, and of interest to agriculture are the references to agricultural policies contributing to the obesity epidemic. The next sections will review the history of agriculture policy and discuss the connections between agriculture policy and obesity.

Policy implications for Agriculture

With the major focus changes of the current administration, debate is likely to intensify regarding farm program legislation. Large looming deficits in the federal budget will again raise issues about the benefits and costs and the need for farm programs. Some believe that U.S. farm subsidies are necessary for the survival of farms while others argue that they should be reduced or eliminated. Some think they are not targeted properly, with too little support for small farmers yet large subsidies for large agribusinesses that should no longer qualify for subsidies. Likewise, some contend that U.S. farm subsidies have benefits that extend beyond farmers, while others maintain that those subsidies have negative impacts for farmers and the general public. This section of the paper will list the common economic arguments for farm programs and address issues relevant to obesity. The goal of this process is to separate fact from fiction and help those interested in the Farm Bill debate make informed decisions regarding future U.S. agricultural policy.

Farm Program History

Farm subsidies--as we think of them today--were first passed as part of the Roosevelt New Deal legislation in 1933. The most common justifications offered by supporters of U.S. farm programs have traditionally included saving the family farm, supporting rural communities, providing a cheap food supply, maintaining the environment, and competing with large agribusinesses and subsidizing countries. The most commonly used rationale for farm subsidies is saving the family farm. Although farm programs have changed over time, this rationale to save the family farm with subsidies still resonates today.

The Agricultural Adjustment Act of 1933 subsidized farmers by supporting selected agricultural commodity prices at 100 percent parity, which was a purchasing power ratio indexed to 1910 through 1914 farm prices and expenses. The parity price concept is problematic as the base period was arbitrarily selected to correspond to a brief period of high commodity prices, referred to as the "golden period" of agriculture. In addition, the parity index ignores all the efficiency gains that have occurred since 1910-14.

Beginning in the 1950s, changes were continuously made to farm programs in an effort to reduce commodity surpluses that resulted from programs that supported prices above market clearing levels. As the surpluses increased, so did the cost to the U.S. government. Consequently, the government made

efforts to reduce the surpluses through reduced price supports, production controls, and land retirement programs. In addition, to reduce government held commodity stocks, export subsidy programs were established to "sell" surplus U.S. commodities in foreign markets.

The program mechanisms used to reduce farm commodity surpluses were largely ineffective--resulting in a shift to direct payments as a method to supporting farmers. For over two decades, the primary direct payment mechanism was the target price-deficiency payment program. Under this program, the government would pay farmers the difference between the target price for a commodity (which is set by the government) and the market price. Those payments were based on historical production, and mandated that farmers only grow what they had historically produced.

These traditional farm programs worked in a domestic economy, but high price supports and massive land retirement priced the United States out of world markets and encouraged increased production overseas. This backfired as U.S. agriculture became more and more global. Today, no major sector of the U.S. economy is more export dependent than agriculture. The American farmer idled land, farmed the rest less efficiently, put grain in storage, and watched the rest of the world increase production and gain market shares. That's the history lesson to 1996.

Recent Farm Bills

The 1996 Farm Bill (Freedom to Farm) was a watershed act for U.S. agricultural policy. The major difference between Freedom to Farm and previous farm bills is that it introduced payments to farmers that are not coupled to market prices and specific production decisions. Fixed payments, based on historical acreage bases and yields, are made to farmers regardless of market prices and the crop planted (if any). The only restriction placed on planting decisions is that fruit and vegetables cannot be planted on program acreage. The program has changed such that the American farmer has the flexibility to farm the marketplace rather than the government program.

The 2002 Farm Bill continued the popular planting flexibility of Freedom to Farm through direct (fixed) payments. The marketing loan program of the 1996 Farm Bill was also continued, though at revised loan rates. In addition, a third safety net tool was provided with the counter-cyclical payment program. This program mimics the target-price/deficiency payment system of the 1990 Farm Bill, except for the new counter-cyclical payments being decoupled from current production. The introduction of the counter-cyclical payment, along with continued emphasis of the marketing loan program, effectively changed the market-oriented direction of the 1996 Farm Bill.

While one can debate how much the 2008 Farm Bill continues the market-oriented policies first established in 1996 farm Bill, there is little question that the bill continued the substantial subsidies for producers of program commodities. In addition to continuing the three farm safety net programs of the 2002 Farm Bill (direct payment program, counter-cyclical payment program, and marketing loan program), the 2008 Farm Bill added two other support programs with the Average Crop Revenue Election (ACRE) and the Supplemental Revenue Assistance (SURE) programs. These two new programs are designed to provide revenue protection instead of only supporting price. Over the last two decades, federally subsidized crop insurance products have provided additional support to U.S. farmers.

Throughout most of the time period, U.S. agriculture has been characterized by chronic surpluses and low market prices. Government programs designed to alleviate the problem often exacerbated it. While

burdensome to the government (and therefore taxpayers), the chronically low market prices did benefit U.S. consumers, providing the cheap food supply rationale for farm subsidies.

Cheap Food Supply

One of the most popular justifications farm subsidy advocates offer for continuing to subsidize agriculture is that U.S. consumers spend less on food than any other nation. Since peaking at a high of 25.2% in 1933, figure 5 shows the percentage of disposable personal income spent on food in the U.S. has steadily dropped to 9.6% in 2008 (USDA-ERS). Over that period of time, real disposable personal income has experienced a 11.1 fold increase while the amount of money spent on food has increased only 4.4 times. When compared to other countries in terms of the amount of money spent on food as a percentage of all household expenditures, U.S. consumers easily spend the lowest amount (Table 5). Although U.S. consumers spend a smaller share of all household expenditures on food, it must be noted that total household expenditures are significantly higher in the U.S. than the other countries listed in table 5.

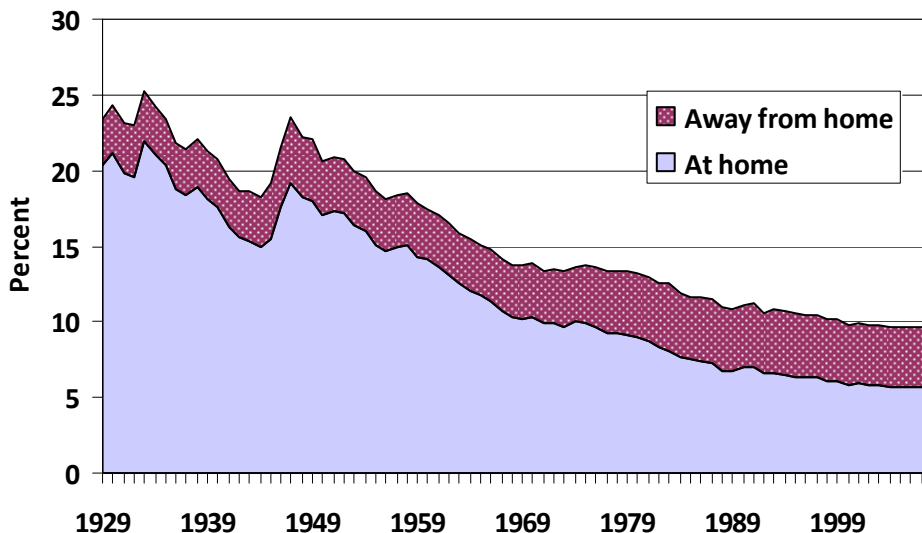


Figure 5. Percentage of Disposable Income Spent on Food in the U.S.

Source: USDA-ERS. 2008. *Food Expenditures by Families and Individuals as a Share of Personal Disposable Income*.

Are farm subsidies responsible for the fact that U.S. consumers spend relatively less on food than other countries? Two recent papers address this question. Miller and Coble evaluated the impact that U.S. farm subsidies had on the proportion of disposable income spent on food. The study concluded that from 1960-1999, government payments to farmers were not statistically significant in determining the percentage of disposable income spent on food. Rather, disposable income, productivity, and the farm-to-retail spread of food commodities had a statistically significant impact on the proportion of disposable income spent on food.

Table 1. Share of Household Final Consumption Expenditures Spent on Food by Selected Countries, 2007.

Country	Food Share of Household Expenditures (%)	Household Consumption Expenditures	
		Total (\$)	Food (\$)
United States	6.9	32,251	2,223
United Kingdom	8.6	27,272	2,351
Canada	9.2	23,993	2,203
Germany	11.4	21,832	2,497
France	13.7	23,184	3,176
Japan	14.6	18,737	2,742
Mexico	24.2	5,579	1,348
India	32.4	536	174
China	34.9	882	308
Philippines	37.3	1,136	424
Pakistan	45.7	634	290

Source: USDA-ERS, 2008 *Expenditures on Food, by Selected Countries, 2007*.

An article by Babcock looks at the issue in a different manner, but reaches the same conclusion. Babcock focuses on the price spread of a raw commodity (corn) and a finished retail product (pork). Using values from the article, corn accounts for approximately 10.64% of the retail price of pork. Thus, if commodity prices would increase by 5% if government payments were eliminated, the price of pork would increase by only 0.53%. Since the cost of the raw ingredient is generally a small share of the price of a finished food product, the price of the raw ingredient would have to increase significantly in order for the price of retail food to increase appreciably.

Based on these two points, the argument that farm subsidies provide a cheap food supply to U.S. consumers does not hold up. The argument is especially misplaced with commodities such as milk and sugar that are beneficiaries of price supports and supply controls that keep the prices U.S. consumers pay above world equilibrium prices. Such policies are especially burdensome on the poor, who spend a higher portion of their disposable income on food.

Although the cheap food supply argument has little to no merit, it does refute an argument that has been made recently: that the cheap food resulting from farm subsidies are one of the causes of obesity

in the U.S. If farm subsidies do not result in a cheap food supply as demonstrated above, then the subsidies cannot be a root cause of obesity.

Fruit and Vegetables

In recent Farm Bills, nutrition and food assistance interests have played a key role in developing a coalition to pass the bills. However, the willingness of some of these groups to be supportive of commodity programs in the Farm Bill to meet their own interests may be waning. For example, some in the nutrition arena are beginning to question why the U.S. is subsidizing food and feed grains and not “more nutritious” fruits and vegetables.

Similarly, although the fruit and vegetable industry has not received subsidies through the traditional farm programs, they have lobbied for other kinds of support in recent years. Since 1996, one way the industry has been supported is through planting restrictions. The restriction mandates that farmers who are enrolled in the farm program cannot plant fruits and vegetables on base acres. This provision in recent farm bills effectively keeps many farmers from producing fruits or vegetables since they would give up commodity program payments to do so.

The fruit and vegetable industry has also successfully lobbied for monetary support in recent years as well. In December 2004, the Specialty Crop Block Grant Program was passed as part of the *Specialty Crop Competitiveness Act of 2004*. The program authorized USDA to provide block grants to states with the goals of “increasing fruit, vegetable, and nut consumption and improving the competitiveness of United States specialty crop producers.” The block grant program was authorized \$44.5 million dollars for each fiscal year from 2005 through 2009.

The 2008 Farm Bill was the first farm bill to include a Horticulture and Organic Agriculture title. In addition to increasing funding for the Specialty Crop Block Grant Program (\$466 million over 10 years), the 2008 Farm Bill also provided funding for several other programs for fruit and vegetable producers as well. Additional programs in the Horticulture and Organic title include assistance for food safety and pest and disease management (\$377 million over 10 years), expansion of the Farmers’ Market Promotion Program and direct producer-to-consumer marketing (\$33 million), and assistance to support organic farmers (\$22 million). While funding for the Horticulture and Organic title is small relative to the Commodity title of the 2008 Farm Bill, it does mark a shift in resources in farm bill funding. The question going forward will be whether fruit and vegetable producers will be able to maintain or increase that support.

Use of Sugars in US Diets

Use of sugar in soft drinks has been suggested as a source of excess energy intake which can lead to obesity. Farm policies again have been blamed for the use of high fructose corn syrup in foods. Beghin and Jensen examined how US farm policies have affected the consumption of sugar in the US. They conclude that government policies have raised the price of sugar and decreased the price of corn. As a result, high fructose corn syrup is a cheaper alternative than sugar. They conclude that there are two facts suggesting a relatively weak link between the farm policies and resulting consumption today. First,

the farm value share of sweeteners in foods is relatively small (below 5%). As an example, they state that the corn content of high fructose corn syrup represents 1.6% of the value of shipments of soft drinks by manufacturers. And, this share has decreased over time. Secondly, they examined sugar consumption in other countries with different agricultural policies. They found that countries with different or no commodity programs experience similar increases in consumption of added sugar. They suggest that other country-specific effects, both economic and cultural are obviously influencing the use of sugar and the rates of obesity. They conclude that the current link between US consumption of added sugars and farm policy is tenuous, although historically the link was stronger.

Summary and Conclusions

Obesity is a significant problem with serious health consequences not only for the individuals, but for the entire health system and society. The causes for obesity appear to be numerous and range widely, most of them likely contributing in some way to the problem. Farm programs have been accused of contributing to the obesity problem by producing energy dense foods cheaply. This paper argues that the cheap food supply argument has little or no merit, and thus it refutes the argument that the cheap food resulting from farm subsidies are one of the causes of obesity in the U.S. We would instead argue that cheap food has been produced efficiently by market forces in the United States, and those foods have become one of the choices for consumers. Furthermore, farm programs have become largely decoupled from production, so that farmers can pursue the market. In addition, in recent years, farm programs have begun to be more supportive of fruit and vegetable producers.

In the free market system in the United States, consumer sovereignty is often considered an important part of the freedoms that individuals enjoy. As such, individuals have the right to choose which items they eat, and how much. The producers of food then attempt to produce food efficiently to satisfy the consumer's choices. The U. S. economic system has been extremely successful in producing abundant food cheaply. Healthier foods tend to cost more, and obesity has been linked to energy dense foods that are cheaper. Encouraging consumers to eat healthier, yet more expensive foods, when they prefer more energy dense, cheaper foods is difficult. Solving the obesity problem in the United States presents an enormous challenge that requires continued effort.

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