# Chapter 2
## Supersize It

## ■ Chapter Overview

Americans are getting heavier, and because these weight gains have been disproportionately great among people who were already heavy, obesity in America has more than doubled over the past 40 years. More than 30 percent of Americans now have a body mass index (BMI, a measure of weight relative to height) in excess of 30, the level at which doctors say a person passes from overweight to obese. These developments (which are also seen in many other nations) are well understood in terms of some fairly simple changes in demand and supply.

## ■ Descriptive Analysis

During the first half of the 20th century, Americans also put on weight, although because they had been malnourished and thus underweight at the beginning of the century, this rise in average weights was actually healthy. The early weight gains were prompted by two developments: the move from active employments (in manufacturing and agricultural jobs) to sedentary jobs, which decreased caloric expenditure; and the decline in the price of food, which (due to the law of demand) induced people to increase their caloric intake.

The more recent weight gains, in addition to being less healthy, also appear to have different causes. A small part of the explanation for them is due to reduced caloric expenditures: Americans are spending less time and energy on ordinary household chores. Far more important, however, is the fact tat we are eating far more packaged, prepared foods than before.

Due to major changes in food processing technology, the time cost involved in preparing meals has fallen dramatically. This has reduced the full cost (money plus time cost) of food, leading to the consumption of significantly more calories. The result has been expanding waistlines. The technological innovations in food processing that have caused this include vacuum packing, flash freezing, improved preservatives and flavorings, and, of course, the microwave. Much food preparation now is done outside the home by manufacturers who specialize in that activity and then ship the packaged, prepared food to the consumer to be eaten at home. Because the fall in time costs of consuming the prepared foods greatly exceeds the higher monetary costs of the prepared foods, the net effect is lower total costs and higher caloric intake.

The impact of lower time costs in food preparation can be illustrated with the aid of Figure 3-1, below. The consumer's monetary budget constraint for consuming food and other goods is shown by the line MM'. His original time constraint in consuming food and other goods is shown by the line TT'. As drawn each constraint is binding over some range of consumption bundles, so that the overall constraint faced by the consumer is given by the kinked line MBT'. Technological change that lowers the cost of consuming food causes the time constraint to rotate to TT*, yielding a new overall constraint given by MB'T*.

Persons who originally had been on the constraint segment MB, to the left of B, will find the new technology to be irrelevant: they were originally constrained by their income but not by their time in consuming food, and so their behavior will not change (and they will not gain weight). But for people who had been on the constraint segment BT', the technological change reduces the full cost of consuming food and they will consume more food (and presumably put on weight).

(If food was an inferior good, people initially along BT' might reduce their consumption of food in response to the new constraint. But the income elasticity of demand for food, although low, is still positive, so we can reject the possibility of lower food consumption is response to the reduction in the full cost of consuming it.)

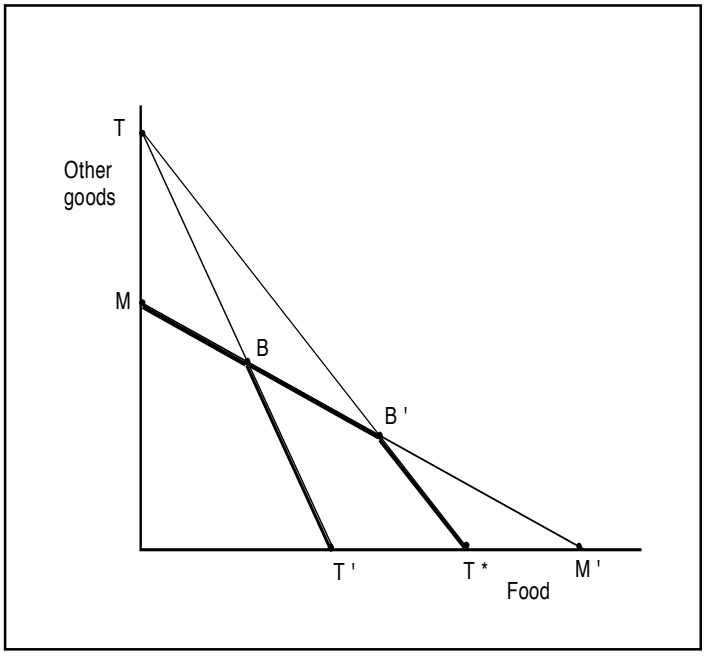


*Figure 2-1* The Impact of Lower Time Costs on the Full Cost of Food

The most likely impetus for this technological revolution in food processing is the workforce decisions of women. Beginning about 40 years ago, women began entering the workforce at such an accelerated rate that their labor force participation rate nearly doubled. Moreover, they have moved into occupations and professions (such as law and medicine) in which annual earnings are much higher than in the traditional fields of female employment. On both counts, the opportunity cost of women's time has been rising, thus increasing the demand for labor-saving conveniences, such as prepared foods. The food industry has responded just as economics would predict.

A final element of this story illustrates a theme we see time and again in the examination of public issues. Over the same period that Americans have been gaining weight, taxes on cigarettes have risen sharply, and the number of places where it is lawful to smoke has shrunk significantly. On both counts, the full cost of smoking has been rising, and one consequence of this is that smoking has been on the decline in the U.S. It is well known that people have a tendency to eat more when they stop smoking and this very fact seems to be showing up in the national statistics on body weight: Where the full costs of smoking have risen the most, so too has the incidence of obesity. In effect, people are being induced to substitute eating for smoking. Despite the adverse health effects of the resulting weight gains, the *net* health trade-offs here are likely positive, given the highly lethal effects of smoking. Still, this development reminds us that although people's behavior can easily be understood by examining the incentives they face, sometimes it is tough ahead of time to determine what all of those incentives are likely to be.

## ■ Answers to End of Chapter Questions

1. In metric terms, the formula for body mass index is

$$B = W/H^2$$

where

B = body mass index

W = weight in kilograms

H = height in meters

This results in the following calculations:

| | | | | |
|---|---|---|---|---|
| Quarterback | = | $99.79/(1.91)^2$ | = | 27.5 |
| Running back | = | $97.52/(1.80)^2$ | = | 30.1 |
| Wide receiver | = | $88.45/(1.85)^2$ | = | 25.8 |

So the quarterback and the wide receiver are both officially overweight, while the running back is obese (albeit, not by much). Muscle mass and frame (skeletal) size are two factors to take into account. One might also consider the person's physical activity level when thinking about how healthy or unhealthy a given BMI might be. Presumably, college football players rate highly on all three.

2. The surcharges raise the full cost of using tobacco, and thus would be expected to induce some people to stop using it to avoid the surcharges. An obesity surcharge (based, for example, on BMI) would be expected to have the same effect. A small number of insurance companies have been experimenting with pricing plans that taken into account weight-related factors.

3. Some localities have banned the consumption of sugared soft drinks in public schools and there is even discussion of imposing excise taxes on such beverages. The politics of taxes and regulations on the consumption of food are more difficult than for smoking, because although only 20 percent of the adult population smokes, 100 percent of the adult population consumes food. Hence, taxes and behavioral restrictions impinge on a much larger fraction of voters. There are also enforcement issues with the behavioral restrictions: it is more costly to determine if a person is obese or is eating a "high calorie" food in public than it is to determine if that person is smoking in public.

4. The number of meals consumed should rise relative to the number of calories consumed, exactly the pattern observed in the data.

5. Married women should have gained weight relative to other people.

6. The answer depends on whether all of the costs of the accidents fell on the people who caused them. If they did, then because they voluntarily "choose" to have those accidents (i.e., drove in ways that yielded the higher accident rates), we can be confident that the decline in the price of the automobile made us better off. If none of the fatalities were among bystanders, and if people were fully informed about the risks of driving, then we could be confident that this was the outcome. If either of these conditions was unsatisfied, we cannot.