Pricing Effects on Food Choices

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ABSTRACT Individual dietary choices are primarily influenced by such considerations as taste, cost, convenience and nutritional value of foods. The current obesity epidemic has been linked to excessive consumption of added sugars and fat, as well as to sedentary lifestyles. Fat and sugar provide dietary energy at very low cost. Food pricing and marketing practices are therefore an essential component of the eating environment. Recent studies have applied economic theories to changing dietary behavior. Price reduction strategies promote the choice of targeted foods by lowering their cost relative to alternative food choices. Two community-based intervention studies used price reductions to promote the increased purchase of targeted foods. The first study examined lower prices and point-of-purchase promotion on sales of lower fat vending machine snacks in 12 work sites and 12 secondary schools. Price reductions of 10%, 25% and 50% on lower fat snacks resulted in an increase in sales of 9%, 39% and 93%, respectively, compared with usual price conditions. The second study examined the impact of a 50% price reduction on fresh fruit and baby carrots in two secondary school cafeterias. Compared with usual price conditions, price reductions resulted in a four-fold increase in fresh fruit sales and a two-fold increase in baby carrot sales. Both studies demonstrate that price reductions are an effective strategy to increase the purchase of more healthful foods in community-based settings such as work sites and schools. Results were generalizable across various food types and populations. Reducing prices on healthful foods is a public health strategy that should be implemented through policy initiatives and industry collaborations. J. Nutr. 133: 841S–843S, 2003.

KEY WORDS: price • food choice • nutrition intervention • eating behavior

The prevalence of obesity and overweight has increased dramatically over the past two decades (1–4). The current obesity epidemic is caused by an environment that promotes excessive food intake and discourages physical activity (5,6). Environmental influences on eating behavior include the changing nature of the food supply, increased reliance on foods away from home, food advertising, marketing and promotion and food pricing (5). The role of fats and sugar in the food supply and dietary intake trends is discussed elsewhere (7). The present report focuses on food marketing practices and pricing strategies.

Foods away from home

Foods away from home captured 40% of total food spending in 1995 (8). “Home” and “away from home” foods are defined based on where the foods are obtained, as opposed to where they are eaten. Foods at home are those purchased at a retail store, a grocery store, a convenience store or a supermarket and prepared for home consumption (8). Foods away from home include those obtained from fast food establishments, schools, restaurants, other public places and vending machines. Away from home foods are typically ready-to-eat and consumed “as is,” and the consumer has less control over portion size and nutritional content (8).

It is well documented that portion sizes for foods purchased at fast food places and restaurants have increased sharply over the past two decades (9). Prepackaged foods purchased in grocery and convenience stores are also being marketed in larger sizes (5,10). For example, in the 1950s, Coca-Cola was marketed in 6.5-oz single-serving bottles. The 12-oz can became the single-serving soft drink size in the 1970s. In 2000 the 20-oz bottle was the typical single-serving size, a 250% increase from the 1950s. Fast food restaurants market supersized sandwiches such as the Big Mac (216 g; 570 kcal); supersized French fries (198 g; 610 kcal) and 42-oz soft drinks (11). Candy bars and potato chips that used to be prepackaged in 1-oz servings are now marketed in 2- to 3-oz single-serving packages (10). Bagels and muffins that used to be 2 to 3 oz are now typically 4 to 7 oz (10).

Larger packages and larger serving sizes may encourage greater consumption at any one meal or eating episode through a variety of physiological or cognitive mechanisms (12). People may underestimate their intake as they purchase larger packages or are offered larger servings at restaurants. Experimental research shows that larger packages of familiar...
brand products encourage the consumption of greater quantities, in part due to perceived lower food cost (12). In naturalistic settings, larger packages are frequently priced less per ounce compared with smaller packages, so this perception is in fact correct. For example, the cost per ounce for soft drinks purchased at a convenience store is $0.05 per ounce for a 12-oz serving but only $0.023 per ounce for a 42-oz serving. This research also suggests that people will consume a greater quantity of food or beverage from a “supersize” serving portion compared with a small portion, especially if the price per ounce is less (5,12).

Individual food choices

Individual food choices are influenced by a wide variety of environmental and individual variables. Three main dimensions related to food choices are taste, perceived value (which includes price and portion size) and perceived nutrition (13,14). Foods vary along each of these evaluative dimensions. Individuals also vary in terms of the importance placed on each dimension (13–15). For example, individuals of lower socioeconomic status may place greater importance on perceived value, whereas those who are mainly concerned about health and nutrition may place greater importance on the nutritional quality of foods (15). In general, people may possess knowledge about healthful food choices, but when considered in tandem with the choice dimensions of price and taste, they may choose the tastier and cheaper, but less nutritious, food. An important question for public health promotion efforts in the area of healthful food choices is, “Can people be influenced to purchase and consume more healthful foods if the foods are increased in attractiveness through lowering prices?”

Price reduction intervention studies

Price reduction intervention strategies to increase the purchases of healthful foods were examined in a series of studies by French et al. (16–20). CHIPS (Changing Individuals’ Purchase of Snacks) examined the effect of a range of price reductions and point-of-purchase promotions on sales of lower fat vending machine snacks at 12 work sites and 12 secondary schools in Minnesota (16). All vending machines at each of the sites were stocked with lower fat snacks (≤11% of the machine inventory). Prices on lower fat snacks were reduced relative to the higher fat snacks by 10%, 25% and 50%.

The percentage of lower fat snacks sold under each price reduction condition is shown (Fig. 1). Price reduction was associated with a significant increase in percentage of lower fat snack sales. When prices were reduced by 10%, 25% and 50%, the percentage of lower fat snack sales increased by 9%, 39% and 93%, respectively. Promotion had a small but significant independent effect on percentage of lower fat snack sales. Overall, snack sales volume also significantly increased in the 25% and 50% price reduction conditions. Average monthly profits per machine did not significantly differ by price reduction condition.

Reducing snack prices in vending machines showed that small price reductions can be an effective means to encourage the selection of lower fat snacks by the consumer. The generalizability of this finding to food types other than prepackaged high fat snacks was examined in a second study (18). This study examined the effects of price reductions on purchases of fresh fruit and vegetables in two secondary school cafeterias. An important question was whether the price reduction strategy would be effective among an adolescent population, a population that stereotypically perceives fresh fruits and vegetables as less attractive food choices (21,22).

The price reduction targeting fruits and vegetables was implemented in two secondary school cafeterias. One school was located in a primarily white, middle-income suburban area, whereas the other school was located in an urban area with a mixed ethnic and socioeconomic population. Fresh fruit and baby carrots were targeted for 50% price reductions.

![FIGURE 1](https://example.com/fig1.png)

**FIGURE 1** Low-fat snack sales as a function of price. From French et al. (18).

![FIGURE 2](https://example.com/fig2.png)

**FIGURE 2** Fruit sales as a function of price. From French et al. (16).

![FIGURE 3](https://example.com/fig3.png)

**FIGURE 3** Carrot sales as a function of price. From French et al. (18).
Results showed that during the price reduction period, sales of fresh fruit increased four-fold, from 14 items per week to about 63 items per week (Fig. 2), and sales of baby carrots increased two-fold, from 37 packets per week to 77 packets per week (Fig. 3). Sales returned to baseline levels with the reinstatement of usual prices.

The financial feasibility of lowering prices as a strategy to promote healthier food choices is a legitimate concern. In the absence of government or other subsidies, large increases in sales volume might be necessary to offset decreases in profits resulting from price reductions on targeted foods. One strategy that has been proposed is to raise prices of popular high fat energy-dense foods to generate revenues that could then be used to subsidize price reductions on healthier foods. This strategy was recently pilot-tested in a single high school during an entire school year (19). Seven foods were targeted during the intervention: three popular high fat foods (French fries, cookies and cheese sauce) and four lower fat foods (fresh fruit, low fat cookies, low fat chips and cereal bars). Prices ranged from $0.35 to $1.00. Prices on the higher fat foods were raised by approximately 10% and prices on the lower fat foods were reduced by approximately 25%. Price changes were implemented at the start of the school year and continued through the end of the year. Sales data were collected from the school food service point-of-sale cash register data. Results showed that estimated pooled revenues from the seven foods were within 5% of revenues estimated for usual price conditions.

These school-based data suggest that a strategy that implements small price increases on lower fat foods and modest price reductions on lower fat foods is potentially financially feasible as a long-term strategy to promote healthful food choices. Altering the hierarchy of food prices is a way to influence the economics of food choice. The economic strategy merits further study using a broader range of foods and settings. The success of this or other pricing strategies may be limited to controlled settings such as work site and school cafeterias, in which food choices are somewhat limited and the population is a “captive audience.” However, the pricing strategy holds promise as a powerful means to influence food choices. Further work is merited to examine the effects of simultaneous price increases and decreases on food revenues and sales volume.

Price incentives can be an effective intervention strategy to influence individual food purchases. Price reductions had consistent and strong effects on purchasing patterns of targeted foods in work site and school cafeteria settings. These results were generalizable across diverse foods such as prepackaged snacks and fresh fruits and vegetables. Food choices were consistent across adolescent and adult populations and across diverse socioeconomic groups.

These studies have implications for the marketing of low nutrient–dense foods as opposed to more healthful foods. Specifically, removing price incentives for “supersize” portions on high fat, high energy foods might be an effective strategy to limit the purchase and consumption of low nutrient–dense foods by the consumer. The effect on food choices of price increases and decreases of various magnitudes also merits further study. An important consideration is the effect of pricing strategies on food choices at the individual versus the population level. Pricing effects could be quite different on individual food choices in a cafeteria setting versus at the population consumption level. At the population level, through policy changes, pricing strategies potentially could be used to encourage fruit and vegetable consumption through government price subsidization or to influence food choices among participants in government-sponsored food assistance programs. Clearly, more research is needed to better understand the potential effects of various pricing strategies on individual and population food choices.

LITERATURE CITED