

# Understanding Fruit and Vegetable Choices

## Economic and Behavioral Influences

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Agriculture Information Bulletin Number 792-1

October 2004

Increasing Americans' consumption of fruits and vegetables has been a mainstay of Federal dietary guidance for more than a decade. USDA's Food Guide Pyramid recommends 2-4 servings of fruit and 3-5 servings of vegetables daily. As a member of the 5-A-Day public-private partnership, USDA partners with other government agencies and private sector groups to promote the health benefits of fruits and vegetables to consumers.

Fruits and vegetables are leading sources of several essential nutrients such as vitamins A and C, potassium, and folate. In addition, diets rich in fruits and vegetables are associated with decreased risk of chronic disease. Now, with obesity the most prevalent nutrition-related health problem in America, the role of fruits and vegetables in helping Americans maintain a healthy weight, or lose excess weight, is receiving attention.

Eating more fruits and vegetables is common weight-control advice. Generally, fruits and vegetables have fewer calories per serving than most foods, making them a good substitute for higher-calorie foods. Most are high in dietary-fiber, which promotes a feeling of fullness and may make it easier for individuals to limit their calorie intake.



These are biologically plausible reasons to believe that eating more fruits and vegetables will help control or reduce weight, but what of the evidence? Several studies suggest an association between fruit and vegetable consumption and healthy weight status, but a conclusive causal link has not yet been established. Using national

food consumption data collected by USDA in 1994-96, ERS economists Lin and Morrison found eating more fruit to be associated with a lower body mass index (BMI), a measure used by health experts to assess body weight in relationship to height. This was true for both adults and older children. For vegetables, however, there was no consistent relationship. Lin and Morrison speculate that one explanation may be the vegetable choices consumers make. Nutritionists recommend a variety of vegetables, including regular servings of deep-yellow and dark-green vegetables prepared with limited amounts of fats and sugars. In contrast, the most popular vegetable choice of most Americans is fried potatoes.

A CDC-commissioned review of dietary intervention studies supports the belief that appropriate choices of vegetables, as well as fruits, can be the key to their weight-control benefits. This review concluded that when interventions that

promoted higher-fiber, more filling fruit and vegetable choices, along with weight reduction advice, it did seem to be helpful. Variyam and Callahan found that in a national sample of adults, those aware of the 5-A-Day program were less likely to be overweight. The study did not track what these people actually ate, so we can't assess the extent to which fruit and vegetable intake plays a role. Nevertheless, the 5-A-Day program has restricted its promotional efforts to fruits and vegetables with limited added calories from fat and sweeteners, so some inferences may be drawn.

While these studies do not prove a cause-and-effect relationship, making the fruit and vegetable choices recommended by the Food Guide Pyramid and the 5-A-Day Program certainly seems likely to help consumers with their weight control efforts, while also providing nutritional benefits. This positive message comes at a time when fruits and vegetables are increasingly available in convenient forms. The growth of international trade means increasing availability of a wide range of fresh produce on a year-round basis. In addition, value-added products such as bagged, pre-washed spinach and salad or "snack-pack" baby carrots and celery sticks now provide consumers with convenient preparation and take-out options.

Has this combination of nutrition promotion, trade expansion, and marketing innovation resulted in increased produce consumption? Sadly, USDA food supply data indicate that although produce consumption has increased, it still fails to match recommendations. For vegetables, total consumption is higher, but the choices consumers make do not match recommendations—too many fried potatoes and too few servings of deep green and yellow vegetables.

### *Why, despite public promotion of their health benefits and expanded purchasing options, have consumers not responded more to efforts to increase fruit and vegetable consumption?*

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#### **Would you like fries with that? Potatoes lead vegetable choice**



Pyramid-based serving  
per capita per day

|                                    | 2002 food<br>supply <sup>1</sup> | Recommended |
|------------------------------------|----------------------------------|-------------|
| Dark green, leafy                  | 0.18                             | 0.6         |
| Deep yellow                        | .21                              | .8          |
| Legumes                            | .23                              | .6          |
| Other starchy<br>(mainly potatoes) | 1.29                             | .8          |
| Other vegetables                   | 1.80                             | 1.3         |
| Total vegetables*                  | 3.71                             | 4.0         |

\*May not add due to rounding.

<sup>1</sup>Source: U.S. Department of Agriculture, Economic Research Service, Food Supply Data Series provides annual estimates of the amount of food available for human consumption in the United States. These figures exclude inedible portions and adjusts for spoilage and waste.

tion? The series of research reports summarized in this packet examines economic, social, and behavioral factors influencing consumers' fruit and vegetable choices.

The cost of fruits and vegetables is a commonly cited reason why consumers don't eat more of these healthy foods. This is somewhat surprising, since rising incomes and low food prices mean that Americans now spend less of their income on food than ever before—10.1 percent of disposable personal income in 2002 versus 20.5 percent in 1950. Using national data on household food purchases, Reed et al. found numerous affordable options among both fresh and processed fruits and vegetables whereby consumers could meet Food Guide Pyramid recommendations for less than \$1 per day.

Nevertheless, income-constrained consumers may not make purchasing fruits and vegetables a high priority. Blisard et al. found that not only do low-income households spend less on fruits and vegetables than other households, they are also less likely than higher-income households to respond to an increase in income by spending more on these foods. Tellingly, education has a more important effect on purchases of fruits and vegetables than does income, suggesting knowledge of the nutritional importance of these foods

may be the critical factor influencing consumer choice. In another recent ERS study, Lin et al. found that consumers with more nutrition knowledge also made more healthful choices, choosing more dark-green and deep-yellow vegetables and tomatoes—and fewer fried potatoes—than other consumers.

This evidence of the value of information supports investment in nutrition education and promotional campaigns such as 5-A-Day. However, other personal and lifestyle characteristics also play a role, and their influences may enhance or negate information effects. Stewart et al. found that household characteristics such as the presence of children were important in whether the household ate the varied mix of produce recommended by health authorities. The household's ethnic background was also important, with Asian and Hispanic households more likely to eat a variety of vegetables. Both these findings remind us that eating is a social behavior, and the good intentions created by nutrition information are more likely to be acted upon if they are compatible with household habits and tastes. Promotional advice that provides flexible strategies for accommodating a range of preferences and lifestyles may be more effective than nutrition information alone.

The most important food-related lifestyle change of the past two decades is probably the increase in consumption of food prepared away from home, whether eaten in restaurants or as take-out or home-delivered meals. But when Americans order their restaurant or take-out meals, fruits and most vegetables seldom make the list. USDA data indicate that while food prepared away from home makes up about a third of the average American's daily caloric intake, it accounts for less than ½ a serving of fruit, and 1¼ servings of vegetables.

If Americans continue to eat more foods prepared away from home and continue to eat fewer fruits and vegetables when they do, this could have a paralyzing effect on campaigns to increase fruit and vegetable consumption. Lin examined how demographic trends, increasing nutrition knowledge, and the shift to more food prepared away from home might affect future fruit and vegetable consumption patterns. While increasing nutrition knowledge is expected to raise fruit and vegetable consumption, increased consumption of food away from home could nullify these gains.

These findings present a clear challenge to those seeking to promote fruit and vegetable consumption. Successful produce promotions must get consumers to choose fruits and vegetables when eating food prepared away from home.

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Recently, restaurants and fast-food establishments have placed more marketing emphasis on healthful menu options such as salads and fresh-cut fruit. Several of these products appear to be popular with consumers, in comparison to previous industry attempts to market “healthy choices” that did not succeed in the marketplace.

As the research briefs in this series illustrate, many behavioral and economic factors lead to the consumer's decision whether to eat fruits and vegetables. Understanding these factors will help the food industry develop and market fruit and vegetable products that offer consumers convenience, flexibility, and options when eating out. But in the end, consumer preference drives the marketplace. To the extent that a better understanding of factors influencing fruit and vegetable consumption leads to more effective consumer education and promotion strategies, the market should respond, making it ever-easier for consumers to find appealing ways to eat their “5-A-Day.”

### Further Reading

Blisard, N., H. Stewart, and D. Jolliffe. *Are Fruit and Vegetable Expenditures by Low-Income Households Responsive to Changes in Income?*

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Lin, B-H., and R.M. Morrison. “Higher Fruit Consumption Linked with Lower Body Mass Index,” *Food Review* 25(3), Jan. 2003, pp. 28-32.

Lin, B-H. *Fruit and Vegetable Consumption: Looking Ahead to 2020*.

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Putnam, J., J. Allshouse, and L. Kantor. "U.S. Per Capita Food Supply Trends: More Calories, Refined Carbohydrates, and Fats," *Food Review*, Dec. 2002.

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