

Consumer Demand for Fruit and Vegetables: The U.S. Example

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Abstract: Fruit and vegetable consumption has been shown to be an important part of any diet leading towards good health. Factors such as income, aging of a population, market promotion, and consumer awareness of the importance of produce, contribute to increased fruit and vegetable consumption.

Introduction

Fruit and vegetables consumption increases and the composition of products consumed changes as nations become wealthier. For example, fruit and vegetables consumption in the United States has increased over the past two decades along with the Nation's prosperity. Higher incomes provide consumers with freedom to make purchasing decisions based on factors other than meeting basic caloric needs. Increased consumption in the United States has been influenced by several factors, including increased domestic production, product convenience, technological improvements that maintain the quality of fruit for greater periods of time and modify produce to meet consumers preferences, and greater availability and diversity of products through trade. Americans have also increased their consumption of fruit and vegetables as they try to maintain healthier lifestyles.

Background

Fruit and vegetables consumption has been shown to be an important part of any diet leading towards good health. In low-income countries, where meeting caloric requirements is the priority, vegetables, especially starches such as tubers, roots, and legumes make up the bulk of the diet. Consumption is based on locally and seasonally available foods, since people cannot afford expensive imports or the necessary storage

facilities for perishable products. Food consumption patterns change, however, as incomes rise. As discussed in earlier chapters, with higher incomes, it is common for people to include more meats and animal products in their diets, and change the types of produce they consume to include more perishable fruit and vegetables. As illustrated in table F-1, between 1961 and 1998, per capita fruit and vegetables availability increased in countries across all income levels. However, per capita availability for low-income countries is about half the amount of middle-income countries, and less than half of high-income countries.

Fruit and vegetables consumption is positively correlated with income levels, with per capita supply (which can be considered as a measure of consumption) being the highest in high-income countries (table F-1). In high-income countries, a wider selection of products is available as a result of increased variety produced domestically and through trade. In this report, U.S. demand for fruits and vegetables is used to illustrate the impact of income and other factors on produce demand.

In the United States, fruit and vegetables consumption has grown over the past two decades as Americans respond to diverse factors. New fruit and vegetable items are available in the markets today that many Americans did not even know existed 20 years ago. Some fruit and vegetables, such as peaches, grapes, asparagus, and melons, have become available in the market during seasons that they are not domestically produced, thanks to improvements in transportation and imports from other countries. Americans have also

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Table F-1—Global fruit and vegetable supply

	1961	1965	1970	1975	1980	1985	1990	1995	1998
	<i>Kg/Capita/Year</i>								
Low-income countries	78	78	79	81	80	81	81	86	86
Middle-income countries	120	127	132	140	154	155	161	164	170
High-income countries	147	156	178	184	193	204	214	222	223

Source: FAO.

increased their demand for fruit and vegetables as they have become interested in healthier lifestyles. When purchasing fruit and vegetables, many consumers are looking for convenience in the products they choose.

Trends in Fruit and Vegetable Consumption

Fruit and vegetables (including melon) consumption in the United States averaged 741 pounds per person annually during 1997-99, 25 percent above 1977-79. Much of the increase is a result of higher vegetable and melon consumption, mostly fresh vegetables and processed potatoes in the form of french fries (fig. F-1). Vegetable consumption increased more rapidly than fruit, rising 24 percent over this period, compared with 8 percent for fruit. Per capita consumption is calculated as the residual of domestic production adjusted for trade and stocks.

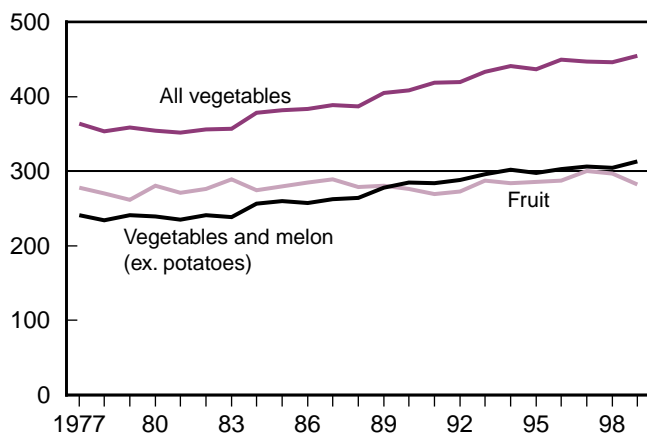
Since the mid-seventies, Americans have changed their consumption preferences. Consumers are eating more fresh and frozen vegetables and fruit and less canned produce (figs. F-2 and F-3). Since the seventies, fresh selections and quality in produce aisles of grocery stores have increased, improving consumers' choices.

As a result, fresh vegetable and melon consumption increased 33 percent and fresh fruit consumption increased 26 percent.

Fresh potatoes accounted for the largest share of fresh vegetable consumption. While the consumption of fresh potatoes has remained stable between 1977-79 and 1997-99, their share of total fresh vegetable consumption has declined as other vegetables' share of the total rose. Consumers are varying their diet of fresh vegetables, increasing their demand for asparagus, broccoli, cauliflower, carrots, onions, and lettuces other than iceberg, among others.

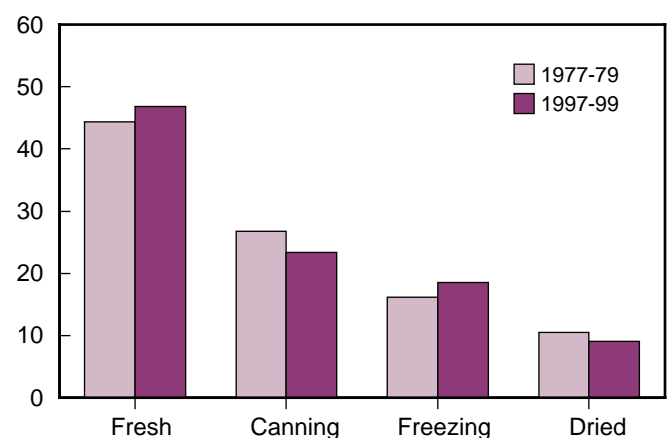
Bananas were the number one fresh fruit consumed in 1997-99, with consumption increasing over the 20 years since 1977-79. Unlike most other fresh produce that is popularly consumed in the United States, bananas are not grown domestically, and Americans (excluding Hawaiians) must rely exclusively on imports. The other leading fresh fruits, apples and oranges, are domestically produced. While fresh apple consumption has been on the rise, fresh orange consumption has declined. Americans are turning to other fresh fruit, such as grapes, pears, and strawber-

Figure F-1
Per capita U.S. fruit and vegetable consumption
Pound (farm weight)



Source: Economic Research Service, USDA.

Figure F-2
U.S. vegetable and melon consumption
Percent

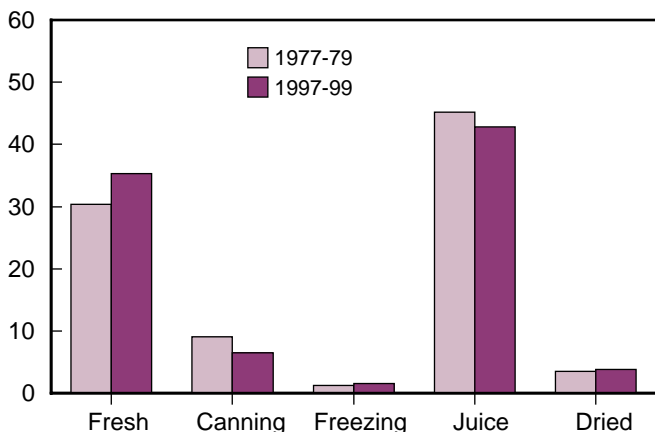


Source: Economic Research Service, USDA.

Figure F-3

U.S. fruit consumption

Percent



Source: Economic Research Service, USDA.

ries, partially because they are now available in the market for longer periods of time than in the past.

Although fruit and vegetables consumption has been growing over the past two decades, the average American is still not consuming the recommended daily servings, as suggested by USDA's food pyramid or the '5 A Day for Better Health²' program. The USDA food pyramid, designed as a guideline for healthy eating, suggests individuals should consume at least 2 servings of fruit and 3 servings of vegetables every day. (A serving of fruit is equivalent to 1 medium size fresh fruit, one-half cup of chopped, cooked, or canned fruit, or three-quarter cup juice; a serving of vegetables is equivalent to 1 cup raw leafy vegetables, one-half cup other vegetables cooked or raw, or three-quarter cup juice. These serving guidelines vary, depending on recommended caloric intake based on sex and age, USDA/ARS.)

According to the 1994-96 Continuing Survey of Food Intake of Individuals, conducted by USDA's Agricultural Research Service (ARS), only 23 percent of Americans consumed the recommended servings³ of fruit and 41 percent the recommended servings of vegetables. The survey also showed that higher income

² The 5 A Day program is sponsored by The Produce for Better Health Foundation and the National Cancer Institute to promote increased consumption of fruit and vegetables by educating consumers about their health benefits.

³ Recommended servings are based on the food pyramid. Dry beans and peas are classified as vegetables in the survey, while in the food pyramid they are also classified under the meat group as are nuts, because they provide a source of protein. Melons are grouped with fruit.

people were more likely to meet the recommended servings of fruit and vegetables, with the proportion of those meeting the recommended requirements declining as income declines. Interestingly, a greater percentage of men than women, 20 years old and over, met the guidelines set for vegetables; the reverse was observed for fruit.

Factors Affecting the Demand for Fruit And Vegetables in the United States

Much of the yearly fluctuation in consumption data can be attributed to yearly changes in the level of production due to weather or the quantity of acres planted to a crop. International trade has been successful in leveling out consumption fluctuations. During serious domestic production shortages, however, higher prices as a result of reduced domestic supply can drive down consumer demand for a product despite the availability of comparable or substitutable imported produce. An example of the effect of production on consumption data is shown in figure F-1. The decline in fruit consumption in 1998 and 1999 reflects reduced production and higher prices due to poor growing conditions in major production regions of the United States.

Consumers Increasingly Demanding Convenient Fruit and Vegetables

Convenience is an increasingly important factor for consumers when selecting fruit and vegetables. As a result, most Americans consume produce in processed forms. In 1997-99, 52 percent of vegetable consumption was canned, frozen, or dried products; 43 percent of fruit was consumed as juice. While there are many vegetables processed, tomatoes accounted for about 70 percent of canned consumption, and potatoes accounted for about 70 percent of frozen consumption. Orange juice accounted for 63 percent of juice consumption. Processed forms of consumption often utilize a greater quantity of a commodity to get an equal serving size to fresh. Since more of a product is needed to produce a processed product, it results in higher per capita utilization of a good. This is not necessarily equivalent to higher servings of the commodity.

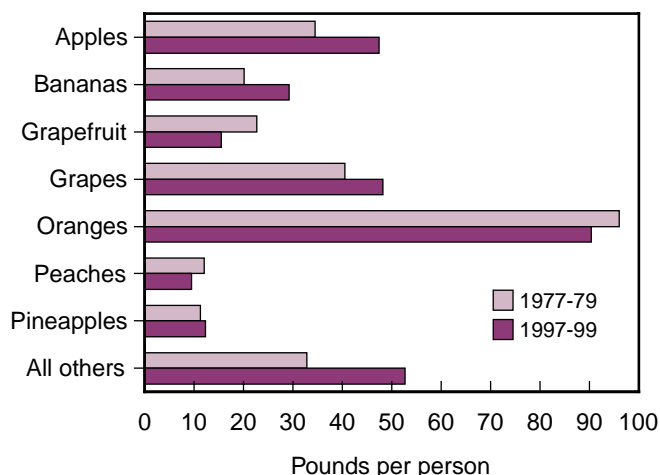
Because convenience is such an important factor to Americans, the most popular fresh fruit are often the most convenient to eat. Americans consume more bananas than any other fresh fruit. Bananas are popular because they are inexpensive and they are easy to eat. Apples are also easy to eat fresh, and grapes are

easy to eat fresh or as raisins. Some fruit are consumed more in processed form than as fresh. Oranges are the number one fruit consumed by Americans, and the most convenient way of consuming oranges is as juice, accounting for 86 percent of orange consumption in 1997-99 (fig. F-4). Other fruit are also increasingly being consumed in the juice form. The fastest growing variety is apple juice, with juice consumption exceeding fresh as the number one use of apples in the late nineties.

The most popular vegetables are also consumed in their most convenient forms, which often includes some processing. Potatoes are consumed mostly as french fries and tomatoes are consumed in their canned form (fig. F-5). The introduction of fresh-cut vegetables has increased consumption of several different products. The consumption of two major fresh-cut products, baby-cut carrots and bagged salads, has grown tremendously. These products were new to the markets in the late eighties and have since become a mainstay on the produce shelves in the grocery stores. They provide a more convenient way for consumers to eat fresh produce than the traditional way lettuce and carrots are marketed.

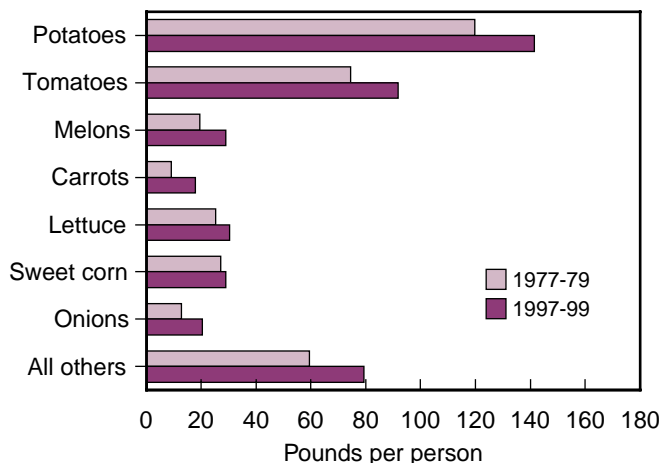
Consumption of frozen produce has also increased over the past two decades, mostly because they appeal to consumers since they are easy to cook and the frozen form of a commodity is available out of season. Frozen product consumption has risen rapidly, increasing 44 percent for vegetables and 36 percent for fruit. Fruit and vegetables are pre-cut and peeled and

Figure F-4
Major fruits consumed in the United States



Source: Economic Research Service, USDA.

Figure F-5
Major vegetables and melon consumed in the United States



Source: Economic Research Service, USDA.

ready for cooking, reducing the time needed to prepare a meal. Frozen vegetables are a much larger market than frozen fruit because they are used as side dishes to meals or increasingly as the main course. Frozen vegetables, packaged with seasonings and sometimes meat, offer attractive and quick meal alternatives to busy consumers. Frozen fruit items consist mostly of berries, apples, peaches, and cherries, and mostly are used for making desserts. Frozen fruit still comprise the smallest portion of fruit consumption.

Technology Makes Fresh Products More Appealing

The demand for fresh products has increased as packing and shipping technology has improved. With improvements in shipping, handling, and plant breeding, fruit and vegetables can now be shipped long distances and over greater lengths of time and still maintain appearance and quality. Plant breeding has also produced new varieties of traditional fruit, such as seedless grape and tangerine varieties favored by consumers, increasing demand for these products.

Improved storage facilities provide for year round availability of various commodities. For example, controlled atmosphere storage for apples has resulted in maintaining the fruit crisp until the next crop is harvested. As a result, high quality fresh apples are available year round, increasing fresh apple consumption beyond the fall and early winter seasons.

Concern for Health Increases Consumption

Health issues have also become an increasingly important factor in consumer preferences for produce in recent years. Publicity surrounding scientific studies showing the beneficial values of various fruit and vegetables has been a boom to certain commodities. The growth in broccoli, grape, and berry consumption demonstrates the effect of such publicity on an industry. Health issues alone, however, may not be sufficient to increase consumer demand, especially as the number of studies covering more produce increases. For example, while the grapefruit industry succeeded in receiving endorsements from the American Heart Association, the American Cancer Society, and the March of Dimes to include in their promotions, demand for grapefruit, both fresh and as juice, has declined since 1976-78. Similarly, the cranberry industry grew rapidly after the fruit was found to reduce urinary tract infections. Consumption of cranberry juice, the major use of cranberries, appears to have leveled off in the past 2 years. It appears that while health claims can initially increase demand for a product, they alone may not be sufficient to further expand consumer demand.

The aging of the baby boom population and the increase in the life expectancy of Americans has boosted demand for fresh produce. Studies have demonstrated that spending on fresh fruit and vegetables is higher for households with middle-age and older members (Cook, 1990; Nayga, 1995; Reynolds 1990). Individuals in these age groups tend to increase their consumption of fresh fruit and vegetables because of the reported health benefits of these commodities, and because they have more income to spend on the often more expensive fresh products.

Imported Produce Expands Consumers' Selection

International trade has played a major role in changing consumer demand for fruit and vegetables. Fresh fruit consumption has grown partly as a result of the greater availability of out of season imports. Traditionally, during the winter months, only citrus, bananas, and apples were available in the supermarkets. Since the mid-eighties, however, improved transportation and increased production in Southern Hemisphere countries has made certain fruit, previously unavailable in the United States, now common. Summer fruit such as

grapes, peaches, and plums, mostly from Chile, are being sold in U.S. markets, providing alternatives for consumers. As a result, consumers have substituted imports, especially grapes and pears, for traditional winter fruit such as oranges and grapefruit.

Also through trade, new varieties of tropical produce not grown in the United States have become popular. With an increasingly diverse population in the United States, many people desire the fruit and vegetables they consumed in their native countries. As a result, tropical fruit imports, such as mangoes and papayas, have increased, especially in the nineties. As the general population becomes familiar with these products, demand continues to grow and the product becomes a regular item in the market. A recent example of this is mangoes. The increased popularity of mangoes over the last decade has resulted in imports increasing 184 percent between 1990-91 and 1998-99. Although there are some places in the United States that can produce tropical fruit, imports will be necessary to meet the growing demand.

Imports have also increased for commodities already produced in the United States, creating a more stable supply for consumers. For example, Mexican tomato imports have become an important source of winter tomatoes in the domestic market. In recent years, the fresh tomato market has received a new source of competition, this time from Canada. Canadian greenhouse tomatoes are in the market largely during the spring and fall and compete with Florida and Mexican tomatoes.

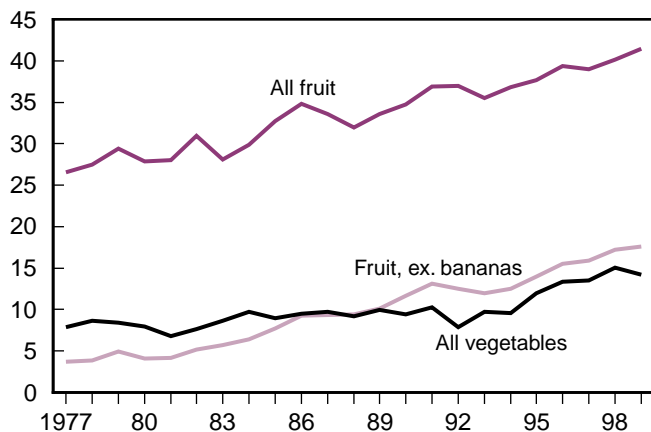
A similar situation has occurred in the citrus market with the import of the tangerine variety, clementines. The increase in clementine imports, mostly from Spain, takes place at the same time that the U.S. citrus market is at its peak. Even though clementines are often higher priced than domestic tangerines and oranges, the popularity of the clementine continues to rise. U.S. consumers like clementines because they are easy to peel and especially because they are seedless.

Imported fruit and vegetables are becoming an increasingly important component of the U.S. diet. Vegetable imports as a share of domestic consumption averaged 14 percent in 1997-99 (fig. F-6). Fruit imports averaged 40 percent of consumption. Fruit consumption, however, is heavily dependent on banana imports. Excluding bananas, the import share of domestic fruit consumption dropped to 14 percent. Fresh fruit

Figure F-6

Imports as a share of fresh fruit and vegetable consumption

Percent



Source: Economic Research Service, USDA.

imports (excluding bananas) as a share of domestic production grew about 8 percent a year between 1977 and 1999. The rising importance of nonseasonal and tropical fruit in the American diet is largely responsible for the growth.

Conclusion

U.S. demand for fruits and vegetables has been influenced by income growth, and other supply-side and demand-driven factors. Not only has the domestic supply benefited from advances in production technology, but also from access to a wider range of sources around the world. Consumers can expect a wider array of produce on the grocery store shelves and lower to stable prices for traditionally consumed commodities as shipping and handling techniques improve, reducing loss. The continued research find-

ings about the health benefits of fruit and vegetables have kept produce consumption in the limelight, encouraging more consumption. The aging of the affluent baby boomers, with their desire to maintain health, has also resulted in higher consumption of fruit and vegetables.

As incomes continue to grow in developing countries, demand for fruit and vegetables are expected to increase. With increased globalization and the associated changes in lifestyles, demand for produce in developing countries will likely be shaped by the same factors that have affected U.S. demand for these products. As in the United States, availability, affordability, convenience, and health concerns will probably influence future consumption of fruit and vegetables across the world.

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