United States Department of Agriculture

FTS-328-01

September 2007

A Report from the Economic Research Service

www.ers.usda.gov

Increased U.S. Imports of Fresh Fruit and Vegetables

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Contents

Approved by USDA's World Agricultural Outlook Board

Abstract

U.S. imports of fresh fruit and vegetables have increased substantially, particularly since the 1990s. Dominant suppliers are the North American Free Trade Agreement region for fresh vegetables, the Southern Hemisphere countries for off-season fresh fruit, and equatorial countries for bananas. The strong growth in the volume and variety of fresh produce imports has allowed U.S. consumers to eat more fruit and vegetables and enjoy year-round access to fresh produce.

Keywords: USDA, ERS, Canada, Chile, Mexico, NAFTA, Southern Hemisphere, fresh fruit imports, fresh vegetable imports, produce consumption, Chinese garlic imports.

Acknowledgments

The authors received helpful comments from many USDA staff: John Dyck, Gary Lucier, Agnes Perez, Daniel Pick, Susan Pollack, and Greg Pompelli, Economic Research Service; Shari Kosco, Foreign Agricultural Service; Enrique Ospina, Agricultural Marketing Service; and John Love, World Agricultural Outlook Board. The authors also appreciate the editorial and production assistance of Sharon Lee and Anne Pearl.

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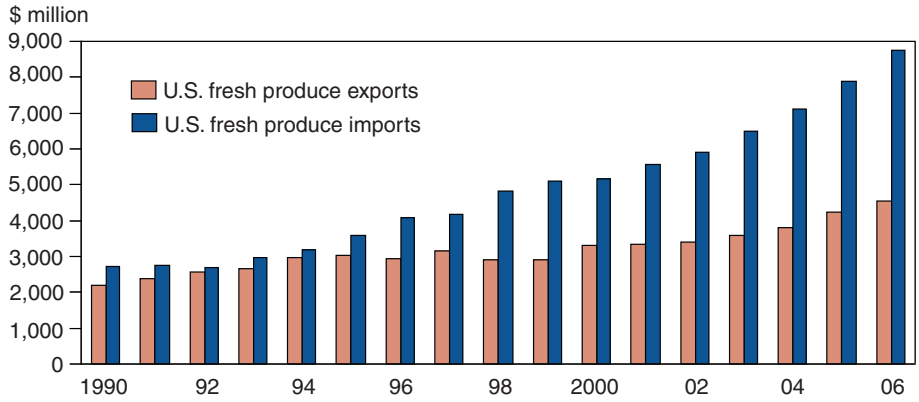
Introduction

Rising consumer incomes, international trade agreements, and improved technology have led to substantial growth in the volume and variety of U.S. fresh fruit and vegetable imports. Between 1990-92 and 2004-06, annual U.S. imports of fresh fruit and vegetables surged from $2.7 billion to $7.9 billion (nominal dollars throughout the report), with the share of total U.S. imports for agriculture rising from 11.5 percent to 13.3 percent. U.S. exports of fresh produce also rose but less rapidly. As a result, the United States has increasingly become a net importer of fresh produce (fig. 1). This report examines the evolving structure of U.S. fresh produce trade to provide insights into changes in this rapidly growing area of U.S. agricultural trade in 1990-2006.[1]

[1]For a review of world trade in fruit and vegetables, see (Huang, 2004).

Figure 1
Imports outpace exports in U.S. fresh produce trade



Source: Prepared by USDA, Economic Research Service, using data from USDA, Foreign Agricultural Service, *FASOnline* U.S. Trade Internet System: www.fas.usda.gov/ustrade/. The database containing U.S. agricultural trade draws on data from the U.S. Census Bureau, U.S. Department of Commerce.

Overview

While production, marketing, and distribution of fresh fruit and vegetables are similar, there are important differences between the two segments for U.S. trade. The average value of U.S. fresh fruit imports in 2004-06 was nearly equivalent to that of fresh vegetables (including fresh melons), at $4 billion and $3.9 billion, respectively. Average fresh fruit exports in 2004-06, at $2.5 billion, however, exceeded fresh vegetable exports of $1.7 billion. Thus, net imports of fresh fruit were about $1.5 billion, considerably less than net fresh vegetable imports of $2.25 billion (table 1).

U.S. fresh produce trade is dominated by a few regions. Fresh vegetable imports from the North American Free Trade Agreement (NAFTA) region (Mexico and Canada), at over $3.2 billion, comprise the single largest trade flow among regions of U.S. fresh produce trade. U.S. fruit trade is more diverse than vegetable trade in terms of foreign trade partners. Whereas fresh vegetable trade is largely concentrated within NAFTA and Asia—95 percent of exports and 84 percent of imports—fresh fruit trade with those regions is less significant—85 percent of exports and 28 percent of imports.

Because fresh produce is highly perishable and seasonal, geography has traditionally played a major role in the global trade patterns of fresh produce. Now, phytosanitary (plant health) measures to prevent the spread of pests or diseases have increasingly become a critical factor in determining trade partners. The U.S. Department of Agriculture's (USDA)

Table 1
Major trade flows of U.S. fresh fruit and vegetables (2004-06 average, nominal dollars)

Produce	Value	Destination of exports						
		European Union	NAFTA	Asia[1]	Southern Hemisphere[2]	Banana-exporting countries[3]	Others	Total
	$ million	*Percent*						
Exports:								
Fresh fruit	2,540	6.1	44.8	40.1	2.8	1.7	4.5	100
Fresh vegetables	1,657	2.2	83.8	10.8	0.3	0.1	2.8	100
		Origin of imports						
		European Union	NAFTA	Asia[1]	Southern Hemisphere[2]	Banana-exporting countries[3]	Others	Total
	$ million	*Percent*						
Imports:								
Fresh fruit	3,995	2.8	26.5	1.1	32.3	35.6	1.7	100
Fresh vegetables	3,922	2.7	82.8	1.6	4.1	6.7	2.1	100

[1]Including East, Southeast, and South Asia.
[2]Southern Hemisphere countries (Argentina, Australia, Brazil, Chile, New Zealand, South Africa, and Peru).
[3]Banana-exporting countries (Colombia, Costa Rica, Ecuador, Guatemala, Honduras, and Panama).
Source: Prepared by USDA, Economic Research Service, using data from USDA, Foreign Agricultural Service, *FASOnline*.

Animal and Plant Health Inspection Service (APHIS) plays a central role in assuring the health of commodities imported by the United States.

To safeguard agricultural and natural resources from the risks associated with the entry, establishment, and spread of plant pests and noxious weeds, APHIS regulates the importation of fresh produce with phytosanitary certificates, importation rules, and inspections. Under authority of Title 7 Code of Federal Regulations (CFR) 319.56, APHIS requires written permits for imported fresh produce (USDA, APHIS, 2007). The regulations also include detailed foreign quarantine notices for fruit and vegetables. For example, grapes from countries where the Mediterranean fruit fly are present are subject to cold treatment as described in CFR 319-2d.

Phytosanitary restrictions may be one of several reasons the United States has relatively few suppliers for imports of fresh produce. Other reasons include such things as cost of production, transportation costs, and climate factors, as well as product demand. Marketing orders, administered by committees of industry handler and grower representatives, with oversight by USDA's Agricultural Marketing Service (AMS), may also affect imports. Under the Agricultural Marketing Agreement Act of 1937, Section 8e, imports of commodities for which domestic marketing orders are in effect can be required to be in compliance with the same or comparable regulations on grade, size, quality, or maturity issued in the marketing order. Presently, 30 active Federal marketing orders cover fruit, tree nuts, and vegetables in the United States (USDA, AMS, 2007).

U.S. Fresh Fruit Imports

The main sources of U.S. fresh fruit imports are banana-exporting countries and the Southern Hemisphere and NAFTA regions (table 1). The banana exporters—Colombia, Costa Rica, Ecuador, Guatemala, Honduras, and Panama—are the largest providers of fresh fruit to the United States. These countries together supply 36 percent of total U.S. fresh fruit imports, with bananas making up more than three-quarters of the fresh fruit value shipped by these equatorial countries to the United States. Southern Hemisphere countries—Argentina, Australia, Brazil, Chile, New Zealand, South Africa, and Peru—supply 32 percent of U.S. fresh fruit imports. The NAFTA region supplies 27 percent of U.S. fresh fruit imports.

Bananas, grapes, and tropical fruit (including pineapples, mangoes, papayas, and guavas) accounted for nearly two-thirds of the value of U.S. fresh fruit imports in 2004-06, with bananas alone representing a 44-percent value share of the combined imports for these three major fruit products (table 2). The structure of the U.S. fresh fruit import mix, however, has changed substantially, particularly since the 1990s—grape and tropical fruit imports have grown faster than banana imports (fig. 2).

For decades, bananas have been the number one fresh fruit consumed in the United States and the leading U.S. fresh fruit import. The volume of banana imports increased steadily until it peaked in 1999, but, since then, it has remained mostly flat. The value share of bananas in the U.S. fresh fruit import mix, however, has declined continuously since 1990—from nearly 60 percent in 1990-92 down to 28 percent in 2004-06. The changing status of banana imports signifies a new chapter in the history of U.S. fresh fruit imports. More varieties than ever before of fresh fruit have entered the trade. One major example is the rising imports of tropical fruit, mainly pineapples, mangoes, and papayas.

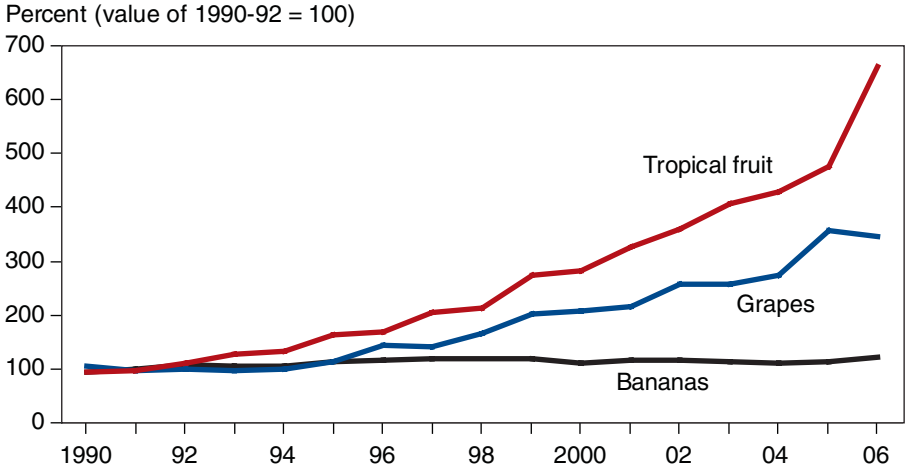
Table 2
Major suppliers of U.S. fresh produce imports

Commodity	Average value 2004-06	Major suppliers
	$ million	
Fresh fruit	3,995	
Bananas	1,146	Ecuador (24%), Guatemala (23%), Costa Rica (22%)
Grapes	865	Chile (71%), Mexico (26%)
Tropical fruit	594	Costa Rica (43%), Mexico (32%)
Other fruit	1,390	
Fresh vegetables	3,834	
Tomatoes	1,121	Mexico (73%), Canada (24%)
Peppers	701	Mexico (71%), Canada (18%)
Cucumbers and gherkins	363	Mexico (79%), Canada (19%)
Other fruit	1,649	

Source: Prepared by USDA, Economic Research Service, using data from USDA, Foreign Agricultural Service, *FASOnline*.

Figure 2

Rapid import value growth of nontraditional fresh fruit



Source: Prepared by USDA, Economic Research Service, using data from USDA, Foreign Agricultural Service, *FASOnline.*

Imports of tropical fruit have grown rapidly since the 1990s; their import value share more than doubled between 1990-92 and 2004-06—from 7 percent to 15 percent. Pineapples, once a favorite fruit for processing, have been increasingly marketed for fresh consumption with the emergence of popular sweet variety pineapples, particularly since the 1990s. Costa Rica has been the dominant supplier (82-percent market share in 2004-06) for U.S. fresh pineapple imports because of the development of a sweet variety by Del Monte.

Imports of other tropical fruit, such as mangoes and papayas, also have risen strongly, boosted in part by an increasingly ethnic population in the United States and the research and promotional efforts by industry organizations, such as the newly established National Mango Board (USDA, ERS, May 2007). Mexico has been the leading import supplier of both mangoes and papayas, with an import market share of 56 percent for mangoes and 76 percent for papayas. Since 2000, however, other countries, such as Brazil, Peru, Ecuador, and Belize, also have increased their share of the growing U.S. import market for tropical fruit. Mangoes from India were recently issued an import permit for the first time in history, although they are required to be irradiated and prices could be many times higher than Mexican mangoes. U.S. commercial production of tropical fruit, which is limited by climate restrictions to mainly Hawaii for pineapples and papayas and Florida for mangoes, has declined almost steadily since 2000 because of weather and other factors.

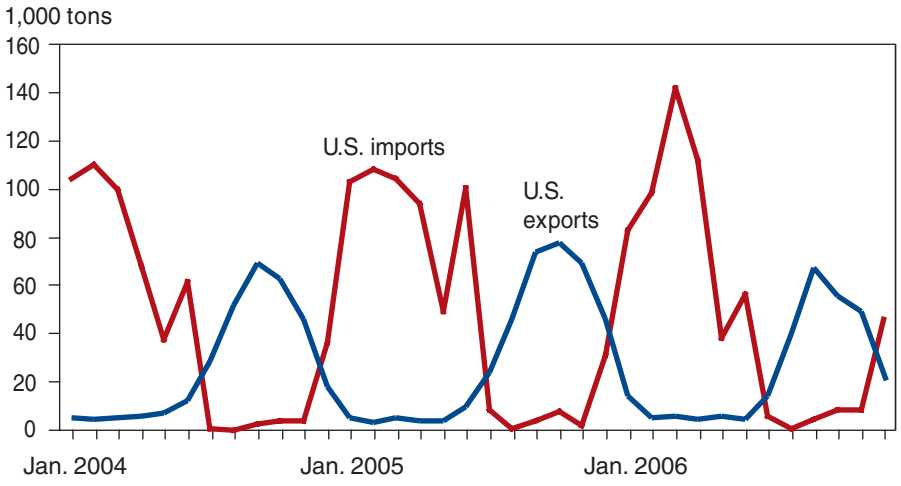
The value share of fresh grapes in the U.S. fresh fruit import mix also rose—from 16 percent in 1990-92 to 22 percent in 2004-06. Between these periods, the import volume of fresh grapes rose 61 percent, while the volume of domestic production increased 16 percent. U.S. trade in fresh grapes, a temperate-climate fruit, illustrates the growing importance of imports to fill the gap for off-season demand in the U.S. fresh produce market. Most grape imports enter the United States during the winter, while domestically produced fresh-market grapes are sold during the summer and

early fall. As a result, U.S. consumers enjoy fresh grapes year round. In the summer, the United States becomes an exporter of fresh grapes (fig. 3). Chile accounted for 71 percent of the value of total U.S. fresh grape imports in 2004-06, while Mexico was the second largest supplier, accounting for 26 percent. Fresh grapes from Mexico supply the U.S. market during the period when Chilean grape shipments drop off and before the largest volume of U.S.-produced grapes, from California's San Joaquin Valley, enter the market.

The value share of total U.S. fresh fruit imports for other deciduous fruit (apples, pears, and peaches) remained steady in the past two decades—ranging from 6 percent to 8 percent for most of the years—with imports from Chile, New Zealand, and Argentina (the top three suppliers). Peach imports are counterseasonal to domestic production, while apple and pear imports mostly come early and late in the season when domestic supplies are light. Apple and pear imports, in general, also help fill in supply gaps resulting from adverse weather as well as make available varieties that are different from those domestically produced. Between 1990-92 and 2004-06, the import volume of these deciduous fruit grew substantially, with 32 percent for peaches, 41 percent for apples, and 60 percent for pears. Thus, increasing imports have expanded U.S. consumers' access to a variety of these deciduous fruit year round. At the same time, the production volume of domestic fresh deciduous fruit was fairly stable (such as apples and pears) or declined slightly (such as peaches).

Real import prices, approximated by import unit value deflated by the Consumer Price Index, remained relatively stable for most of the major imported fruit. An exception was fresh grapes for which real import prices increased after 1995 but with a less stable trend since the beginning of this decade (fig. 4).

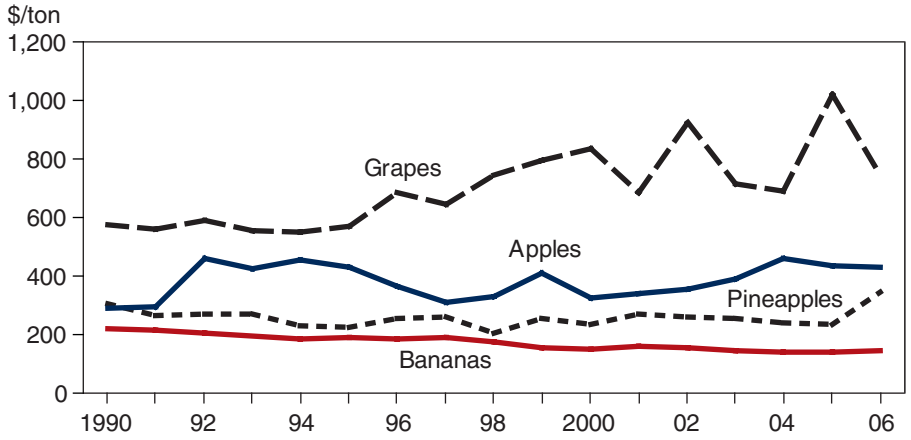
Figure 3
Seasonality of U.S. grape trade: Winter imports, summer exports



Source: Prepared by USDA, Economic Research Service.

Figure 4

Real prices[1] for major imported fresh fruit



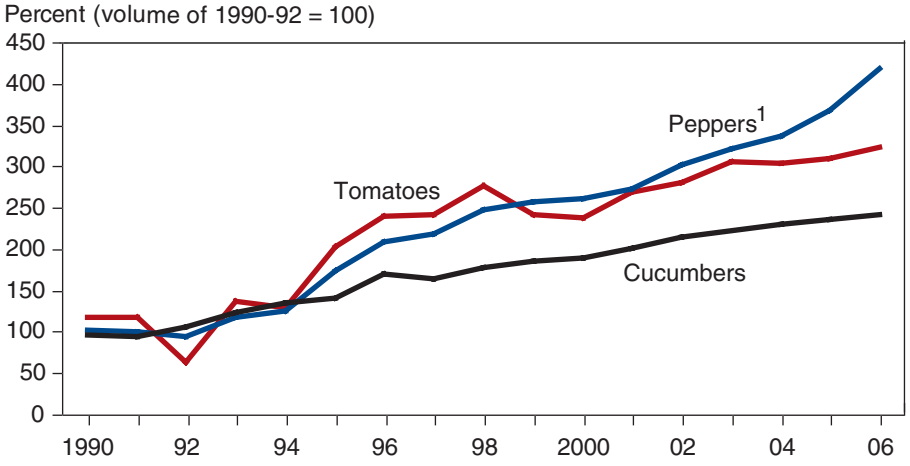
[1]Import unit value deflated by Consumer Price Index.
Source: Prepared by USDA, Economic Research Service, using data from USDA, Foreign Agricultural Service, *FASOnline* for import unit value, and Consumer Price Index from Bureau of Labor Statistics, U.S. Department of Labor.

U.S. Fresh Vegetable Imports

Three fresh vegetables accounted for nearly 60 percent of the total value of U.S. fresh vegetable imports during 2004-06: tomatoes (29 percent), peppers (18 percent, mostly bell peppers throughout this report), and cucumbers (10 percent). In 1990-92, these three vegetables already represented nearly half of the total value of U.S. fresh vegetable imports, with 26 percent for tomatoes, 15 percent for peppers, and 7 percent for cucumbers. Thus, the structural shifts in U.S. fresh vegetable imports were less dramatic than those of fresh fruit. Import volume, however, grew substantially between these two periods, threefold for tomatoes, nearly fourfold for peppers, and twofold for cucumbers (fig. 5). At the same time, domestic production also increased. For example, the volume of fresh tomato production rose about 9 percent between the periods. As with seasonal fresh fruit imports, increasing imports of these products makes it possible to satisfy consumer demand for fresh vegetables year round. The real import prices of these major vegetables were relatively stable but with a slightly upward trend for cucumbers since 2000 (fig. 6).

NAFTA partners supply most U.S. fresh vegetable imports (fig. 7). During 2004-06, Mexico accounted for 64 percent of the total value of U.S. fresh vegetable imports, while Canada accounted for 19 percent. Mexico has been the dominant supplier for U.S. fresh vegetable imports for several decades, and, since the establishment of NAFTA, imports from that country have further increased. During 2004-06, Mexico's share in the U.S. import market was 73 percent for tomatoes, 71 percent for peppers, and 79 percent for cucumbers.

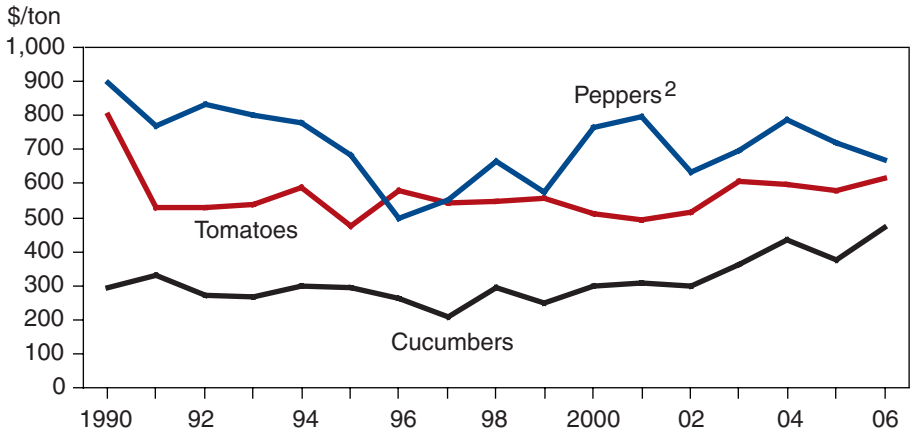
Figure 5
Steady growth for the top three U.S. vegetable imports



[1]Mostly bell peppers.
Source: Prepared by USDA, Economic Research Service, using data from USDA, Foreign Agricultural Service, *FASOnline*.

Figure 6

Real prices[1] for major imported fresh vegetables



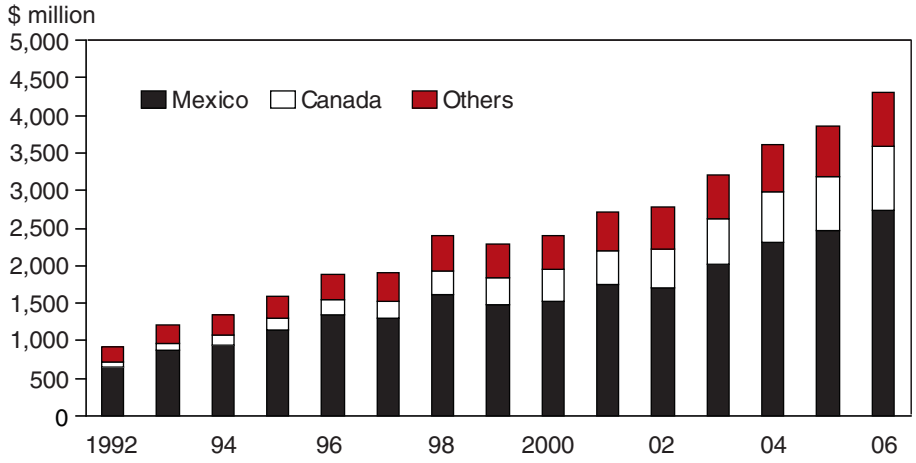
[1] Import unit value deflated by Consumer Price Index.

[2] Mostly bell peppers.

Source: Prepared by USDA, Economic Research Service, using data from USDA, Foreign Agricultural Service, *FASOnline* for import unit value, and Consumer Price Index from Bureau of Labor Statistics, U.S. Department of Labor.

Figure 7

NAFTA partners are the main suppliers of U.S. fresh vegetable imports



Source: Prepared by USDA, Economic Research Service, using data from USDA, Foreign Agricultural Service, *FASOnline.*

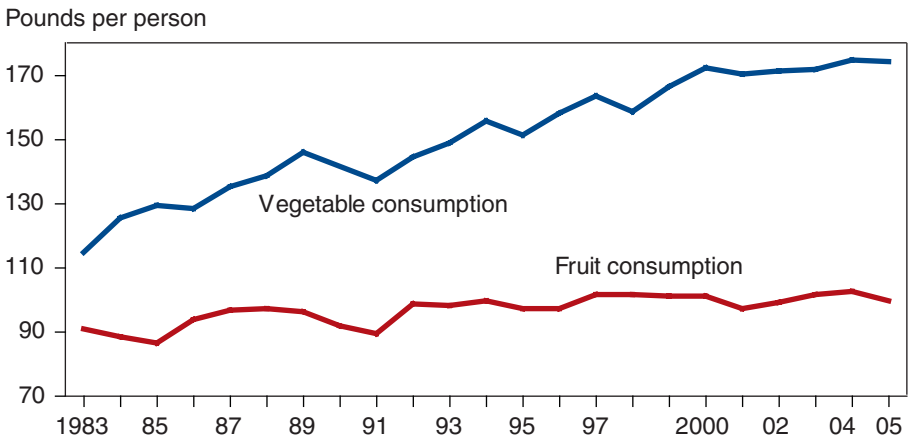
Canada's rising profile in the U.S. fresh vegetable import market marks a dramatic shift. Once a supplier of mainly potatoes, Canada has become the second largest foreign supplier of fresh tomatoes, peppers, and cucumbers. Canada supplied the U.S. import market with 24 percent (value share) of tomatoes, 18 percent (value) of peppers, and 19 percent (value) of cucumbers during 2004-06; by contrast, Canada supplied 2 to 4 percent of each of those vegetables in the early 1990s (USDA, FAS, 2007). Canada's broad application of greenhouse technologies in production and availability of low-cost natural gas, especially in Ontario and British Columbia, substantially enhanced Canada's ability to export vegetables to the United States.

Rising Share of Imports in U.S. Fresh Produce Consumption

The rising imports of fresh fruit and vegetables play a critical role in the increased U.S. consumption of fresh produce (fig. 8). By farm-weight basis, the average American annually consumed (as approximated by per capita disappearance) 13 pounds more of commercially grown fresh fruit and 50 pounds more of fresh vegetables (excluding potatoes, sweet potatoes, and mushrooms) in 2003-05 than in 1983-85. Between these two periods, fresh fruit consumption increased from 88.7 pounds to 101.2 pounds, and fresh vegetable consumption rose from 123.2 pounds to 173.5 pounds (tables 3 and 4). At the same time, imports have taken an increased role in overall U.S. fresh produce consumption (fig. 9). About 44 percent of U.S. fresh fruit consumption and 16 percent of fresh vegetable consumption came from imports in 2003-05, up from 31 percent and 9 percent in 1983-85, respectively. Imports accounted for about half of the growth in consumption of fresh fruit and a quarter of the growth in consumption of fresh vegetables.

Figure 8

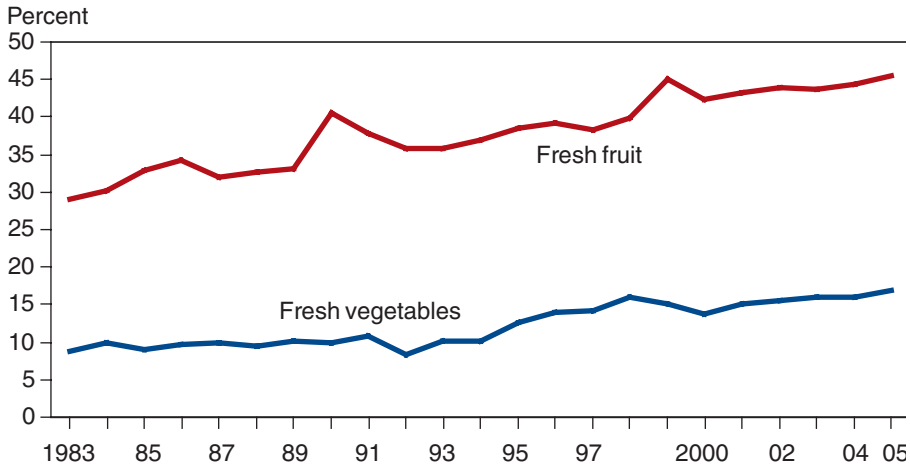
Increasing U.S. per capita fresh produce consumption[1]



[1]Excludes potatoes, sweet potatoes, and mushrooms.
Source: Prepared by USDA, Economic Research Service.

Figure 9

Increasing import presence in U.S. fresh produce consumption



Source: Prepared by USDA, Economic Research Service.

Fresh Fruit

During the past two decades, the growth in U.S. per capita fresh fruit consumption came mainly from tropical fruit (pineapples, mangoes, and papayas), grapes, strawberries, avocados, tangerines, cherries, and blueberries. Per capita consumption of traditional fruit (bananas, apples, oranges, peaches, and pears), although increasing somewhat in the 1980s, decreased thereafter. Meanwhile, import share of overall U.S. fresh fruit consumption greatly expanded. Between 1983-85 and 2003-05, the import share of U.S. fruit consumption increased from 2.3 percent to 15.5 percent for citrus and from 41.2 percent to 53 percent for noncitrus fruit (including bananas). Between 1993-95 and 2003-05, the import share of fruit consumption for the top three fresh fruits consumed by the average American, excluding bananas, also increased: apples (from 6 percent to 7.1 percent), oranges (from 1 percent to 4.2 percent), and grapes (from 38.5 percent to 54.8 percent).

Table 3
Fresh fruit: Per capita disappearance and import share

Fresh fruit	Per capita disappearance			Import share		
	1983-85	1993-95	2003-05	1983-85	1993-95	2003-05
	Pounds			*Percent*		
Total fresh fruit	88.7	98.4	101.2	30.7	37.0	44.4
Citrus	24.0	24.8	22.8	2.3	5.8	15.5
Noncitrus	64.7	73.6	78.5	41.2	47.5	53.0
Bananas	22.3	27.2	25.7	99.9	99.8	99.7
Apples	18.0	19.0	17.6	6.2	6.0	7.1
Oranges and temples	12.8	13.0	11.4	1.4	1.0	4.2
Grapes	6.2	7.2	8.0	27.4	38.5	54.8
Strawberries	2.8	3.9	5.5	1.2	4.3	6.3
Peaches and nectarines	5.9	5.5	5.0	3.2	6.7	10.5
Pineapples	1.6	2.0	4.6	38.2	53.8	85.4
Grapefruit	6.4	6.1	3.6	0.3	1.9	3.6
Lemons	2.3	2.7	3.1	1.6	2.6	7.6
Avocados	1.8	1.4	3.0	2.2	13.2	48.9
Pears	2.8	3.4	3.0	6.3	14.1	19.0
Tangerines and tangelos	1.9	2.0	2.7	5.5	8.2	26.0
Mangoes	0.4	1.0	2.0	87.3	100.0	100.0
Limes	0.5	1.0	2.0	37.3	90.4	100.0
Plums and prunes	1.6	1.3	1.2	4.8	15.7	22.9
Papayas	0.2	0.3	0.9	7.2	56.6	90.9
Cherries	0.6	0.4	0.9	1.9	3.6	6.0
Blueberries	0.2	0.3	0.5	20.7	25.2	43.7
Kiwifruit	0.1	0.5	0.4	13.6	53.9	70.3
Apricots	0.1	0.1	0.1	4.7	8.2	10.9
Cranberries	0.1	0.1	0.1	0	0.2	0

Source: Prepared by USDA, Economic Research Service.

Because of climate, consumption of tropical fruit, which have little or no commercial production in the United States, has long depended on imports. For many other fresh fruit, the import share of U.S. consumption has increased since the 1990s, even for major domestically produced fruit, such as apples and oranges and, to a lesser degree, peaches and pears. In particular, the share of imported grapes (a typical seasonal product) has substantially increased in the U.S. market. Also, U.S. consumption of some highly perishable fruit, such as strawberries and blueberries, has increasingly been supplemented in the off-season by imports since the late-1990s. In fact, berries—among the most fragile of all produce and not long ago very much a seasonal item—now are available nearly year round, thanks to extended domestic seasons and imports.

Fresh Vegetables

Even more than for fresh fruit, per capita U.S. consumption of fresh vegetables substantially increased over the past two decades. The increases were broad based—onions, tomatoes, romaine and other leaf lettuces, sweet corn,

Table 4
Fresh vegetables: Per capita disappearance and import share

Fresh vegetable	Per capita disappearance			Import share		
	1983-85	1993-95	2003-05	1983-85	1993-95	2003-05
	Pounds			*Percent*		
Total fresh vegetables (excluding potatoes, sweet potatoes, and mushrooms)	123.2	151.9	173.5	9.3	11.0	16.3
Potatoes	48.1	49.6	45.3	3.2	5.2	6.1
Asparagus	0.4	0.6	1.1	17.0	48.1	66.2
Broccoli	2.4	4.0	5.7	0.4	3.1	8.9
Carrots	6.6	11.6	8.8	9.4	5.5	7.8
Cauliflower	1.7	1.9	1.5	3.5	2.4	5.1
Celery[1]	7.0	7.1	6.2	0.6	2.2	3.1
Sweet corn	6.3	7.7	9.2	0.4	0.5	1.9
Bell peppers	3.6	6.2	6.8	22.9	17.1	29.5
Onions	13.0	17.3	20.8	8.3	11.3	11.2
Tomatoes	14.2	16.4	20.1	24.0	24.2	35.2
Cabbage	8.5	8.8	8.0	3.5	2.7	3.9
Spinach	0.6	0.7	2.0	0	1.4	3.9
Cucumbers	4.5	5.4	6.3	36.1	38.1	49.3
Artichokes	0.6	0.6	0.6	25.2	35.5	58.9
Snap beans	1.3	1.5	1.9	8.2	6.9	10.7
Eggplant[1]	0.5	0.5	0.8	32.6	37.0	44.3
Radishes	0.5	0.5	0.4	11.3	29.6	31.5
Garlic[1]	1.0	1.8	2.6	16.2	22.0	43.6
Lettuce, head	23.7	23.9	21.3	0.5	0.6	1.7
Lettuce: Leaf/romaine	1.1	5.5	11.4	0	0.6	1.2
Squash	2.6	3.8	4.5	19.9	26.5	41.5
Watermelon	13.1	14.8	13.4	7.4	7.0	14.3
Cantaloup	7.6	8.7	10.3	12.2	23.2	32.3
Honeydews	1.9	1.9	2.1	9.3	24.1	27.0

[1]Includes processing.

Source: Prepared by USDA, Economic Research Service.

bell peppers, cucumbers, broccoli, squash, garlic, snap beans, spinach, asparagus, and more. By contrast, however, per capita consumption of the top two fresh-market vegetables consumed by Americans—potatoes and head (iceberg) lettuce (substituted for by romaine and other leaf lettuces)—decreased. To a much lesser degree, likely because of substitution by other vegetables, the per capita consumption of carrots, cabbage, celery, and cauliflower also declined after the 1990s.

Although most fresh vegetables consumed by Americans are still domestically produced, imports substantially increased in share of consumption over the last two decades—from 9.3 percent in 1983-85 to 16.3 percent in 2003-05. Even for vegetables with declining per capita consumption, such as potatoes and head lettuce, the import share of consumption increased over the past two decades—from 3.2 percent to 6.1 percent for potatoes and from 0.5 percent to 1.7 percent for head lettuce. In addition, although per capita consumption of carrots, cabbage, celery, and cauliflower declined after the 1990s, import shares increased. Thus, since the 1990s, the import share of U.S. fresh vegetable consumption has increased almost across the board. In particular, import share has risen for tender warm-season vegetables that enter the United States during the winter and early spring when domestic supplies are limited. Major vegetables in this category include tomatoes (import share rising from 24.2 percent in 1993-95 to 35.2 percent in 2003-05), peppers (from 17.1 percent to 29.5 percent), and cucumbers (from 38.1 percent to 49.3 percent).

One exception to the rising import share of U.S. fresh vegetable consumption is onions—ranked third in 2003-05 in per capita consumption (following potatoes and head lettuce). Onion demand has increased since the 1970s, with the increasing popularity of fast-food hamburger chains that featured onions on burgers and onion rings as side orders. Since then, with the popularity of salad bars, salsa, and away-from-home foods, onion demand has continued to increase. Furthermore, onions, low in calories and a good source of dietary fiber, are attractive to today's health-conscious consumers. Despite increases in per capita consumption for several decades, the import share of American onion consumption, after more than doubling its share from 5.5 percent in 1980 to 12.5 percent in 1991, remained mostly in the range from 10 percent to 12 percent because domestic production also increased.

Impact on U.S. Production and Prices

To satisfy the rising demand for fresh fruit and vegetables, U.S. production held steady or increased over the past 15 years. Aggregate production volume of 10 major fresh vegetables rose 19 percent between 1990-92 and 2004-05 (USDA, ERS, July 2006). For fresh noncitrus fruit production, volume increased by 16 percent (USDA, ERS, October 2006). For the most part, imports have grown to satisfy increasing consumption, rather than to replace domestic production. One notable exception has been garlic in California (see box).

Although real prices of imported grapes and cucumbers have tended to rise, prices for imported apples have tended to fall and prices of other major fresh produce imports have remained roughly the same since 1990 (see figs. 4 and 6). Thus, volume has increased while prices in general have remained stable, and consumers have gained access to significantly more produce without paying higher prices.

Effects of Chinese Garlic Imports on U.S. Garlic Industry

Consumption of garlic, used primarily as a food-flavoring agent and condiment, soared, especially in the 1990s. U.S. per capita consumption of garlic increased from 1 pound in 1983-85 to 1.8 pounds in 1993-95 and 2.6 pounds in 2003-05. Imports, mainly from China, provided for those increases: The import share of consumption rose from 16.2 percent to 22 percent and 43.6 percent during the same periods (see table 4). Although garlic accounts for 1 to 2 percent of total U.S. fresh vegetable imports by value, rising imports from China have substantially changed the U.S. garlic industry since the early 1990s. Garlic exports from China, the world's leading garlic producer, have grown so much and so rapidly that they have prompted trade disputes with the United States and other countries.

China has many advantages in garlic production. The country has available labor and every type of growing region, resulting in exports of relatively low-priced fresh garlic year round. Other suppliers of U.S. garlic imports, such as Mexico and Argentina, supply garlic during the U.S. off-season—Mexico ships to the United States largely during the spring and early summer, and Argentina ships during the winter. Chinese garlic production, by contrast, is year round and overlaps the marketing window of U.S. producers, most of whom are in California. As a result, Chinese garlic imports put substantial competitive pressure on U.S. fresh garlic producers. China's expanding share of the U.S. garlic import market also comes at the expense of Argentina and Mexico. Between 1990-92 and 2004-06, Mexico's market share plunged from 50 percent to 16 percent by value, while Argentina's dropped from 23 percent to 9 percent.

In 1993, because of a sudden surge in Chinese fresh garlic imports, California growers formed the Fresh Garlic Producers Association and filed a dumping suit with the U.S. Department of Commerce, eventually winning their case. In 1994, the Commerce Department applied a 376-percent tariff on Chinese garlic exporters, claiming they were dumping their product on the U.S. market. As a result, China's share in the U.S. garlic import market dropped from 43 percent in 1993 to less than 1 percent for the rest of the 1990s. Since 2000, however, demand for lower priced Chinese garlic has increased, resulting in greater import volume and a rising share of the U.S. import market. Chinese garlic as a share of U.S. import value rose from 10 percent in 2001 to 78 percent in 2006.

Domestic U.S. garlic acreage and production, after about two decades of strong and sustained growth, peaked in 1999 at 40,000 acres but have since declined. Between 2001-03 and 2004-06, acreage dropped from 34,333 acres to 30,340 acres, and production decreased from 592 million pounds to 498 million pounds. After battling with Chinese garlic imports for more than a decade, U.S. garlic producers appear to have capitulated in the garlic competition; instead of keeping Chinese garlic out of their market, now they are seeking other crops to replace garlic. In addition, California growers now use flavor, rather than price, as the focus of its marketing campaign. U.S.-grown garlic reportedly has a more robust flavor than Chinese garlic. As a result, despite an influx of cheaper imports, the value of the U.S. garlic crop totaled $169 million during 2004-06, up 4 percent from 2001-03.

Except for garlic, China is a minor supplier to the United States—China accounted for 1.5 percent of the total value of U.S. fresh vegetable imports, with 88 percent of that being garlic in 2004-06. While U.S. producers of other fresh vegetables do not face direct competition from Chinese imports, they do face competition from Chinese products in other markets, primarily in Japan. However, China's food safety, quality, and pesticide use in vegetables have been an issue with Japan, particularly since the 1990s (Huang and Gale, 2006).

Key Factors in the Rapid Growth of U.S. Produce Imports

The rapid growth of U.S. fresh fruit and vegetable imports is the result of a number of institutional and economic factors. Consumer preferences have changed while income has risen. At the same time, advanced technology and trade agreements have played important roles in facilitating access to markets, breaking through old constraints, such as climate, location, and growing season.

Strong Demand for Year-Round Supply of Fresh Produce

With increasing incomes, consumers now spend more on fresh produce. Better shipping and handling methods have extended the shelf life and improved the appearance of produce from other countries, filling the gaps where U.S. domestic production is too small or off-season. In addition, health issues have increasingly influenced consumer preferences for fruit and vegetables. According to the 2005 *Dietary Guidelines for Americans*, jointly issued and updated every 5 years by USDA and the U.S. Department of Health and Human Services (HHS), Americans need to eat at least 2 cups of fruit and 2.5 cups of vegetables daily (USDA and HHS, 2005). Industry associations actively promote increased fruit and vegetable consumption by educating consumers about the nutritional aspects of certain products—such as avocados, blueberries, cranberries, and, more recently, mangoes—and providing advice on ways to incorporate them into one's daily diet. Demand for imported fresh produce is stimulated by the increasing size and diversity of ethnic populations and consumers' quest for new taste experiences. As a result, imported fresh produce has been combined with domestic production to provide U.S. consumers with more fruit and vegetable varieties year round.

One classic example of the year-round supply of fresh produce imports is the flow of products coming into the United States from Southern Hemisphere countries. These countries—with their summer during the Northern Hemisphere's winter—play a vital role in making fresh produce available year round in the United States and take advantage of the seasonal differences to expand their markets and meet a growing consumer demand. During 2004-06, Southern Hemisphere countries accounted for 74 percent of U.S. imports of grapes, 83 percent of apple imports, 79 percent of kiwifruit imports, 73 percent of pear imports, and nearly all imported stone fruit (peaches, nectarines, apricots, cherries, and plums). Chile provides 77 percent of U.S. fresh fruit imports from the Southern Hemisphere. Nearly half of U.S. fresh fruit imports from Southern Hemisphere countries are grapes, with 96 percent provided by Chile.

Another example is imports of tender warm-season fresh vegetables during the winter and early spring. Southern Florida is virtually the only domestic outdoor growing area that can reliably produce these warm-season vegetables in commercial volume throughout the winter. But even in Florida, hard freezes remain an annual threat to winter crops. As a result, winter imports

of vegetables help to stablize the U.S. market against production shortfalls due to freezes, heavy rain, and the impact of hurricanes on developing winter crops.

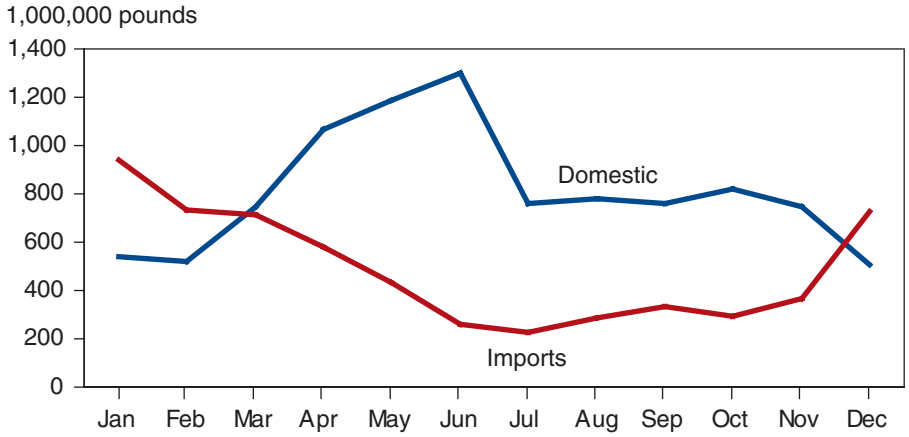
Hardier cool-season vegetables, such as lettuce, broccoli, spinach, and celery, can withstand fluctuating winter temperatures that prevail in the desert southwest of California and Arizona and the Rio Grande Valley of Texas. Consequently, a smaller share of cool-season crops is imported during the winter and spring than that of warm-season crops, such as tomatoes, peppers, and cucumbers (Lucier et al., 2006). Figure 10 illustrates the shipment patterns for bell peppers. Bell pepper import volume begins to surge in November, peaks in January, and then drops continuously until July. Conversely, domestic bell pepper shipments rise after March, peak in June, and remain steady until bottoming out in December.

Greater Fresh Produce Trade Within NAFTA

The U.S. fresh produce trade is flourishing within the NAFTA region, stimulated by elimination of most trade barriers among the United States, Canada, and Mexico. NAFTA took effect on January 1, 1994, incorporating provisions of the 1989 U.S.-Canada Free Trade Agreement. Between 1990-92 and 2004-06, U.S. fresh fruit imports from Mexico and Canada had growth nearly fourfold, from $268 million to nearly $1.1 billion, mainly contributed by imports from Mexico. U.S. fresh vegetable imports from Mexico and Canada also grew nearly fourfold, from $853 million to $3.2 billion, with Mexico being the dominant supplier but Canada, from a much lower base, having a much faster rate of growth.

While both Canada and Mexico target the United States almost exclusively as their export market for fresh produce, a clear distinction can be made between U.S. trade with Canada and U.S. trade with Mexico.

Figure 10
Imports and domestic bell pepper shipments are largely complementary



Source: Prepared by USDA, Economic Research Service, using average 2003-05 data from USDA, Agricultural Marketing Service, Fresh Fruit and Vegetable Shipments.

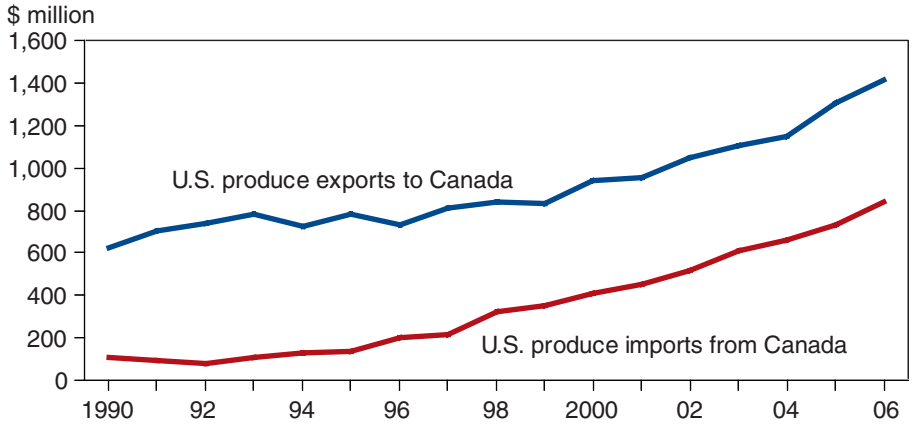
U.S. Trade with Canada

The United States has steadily maintained its role as a net exporter in both fresh fruit and vegetables with Canada, whose colder climate and shorter growing season make it a strong market for U.S. produce. Canada accounted for 23 percent of the total value of U.S. fresh fruit exports and 78 percent of U.S. fresh vegetable exports during 2004-06 (fig. 11). This trend has held even though Canada has emerged over the last decade as an important supplier of greenhouse-grown vegetables to the United States. During 2004-06, Canada held 19 percent of the U.S. fresh vegetable import market, with tomatoes, peppers, and potatoes representing nearly two-thirds of the total value of U.S. fresh vegetable imports from that country. In comparison, Canada is a small supplier of U.S. fresh fruit imports—a 3-percent market share—mainly cranberries (mostly for processing into juice) and, to a much lesser degree, apples.

U.S. Trade with Mexico

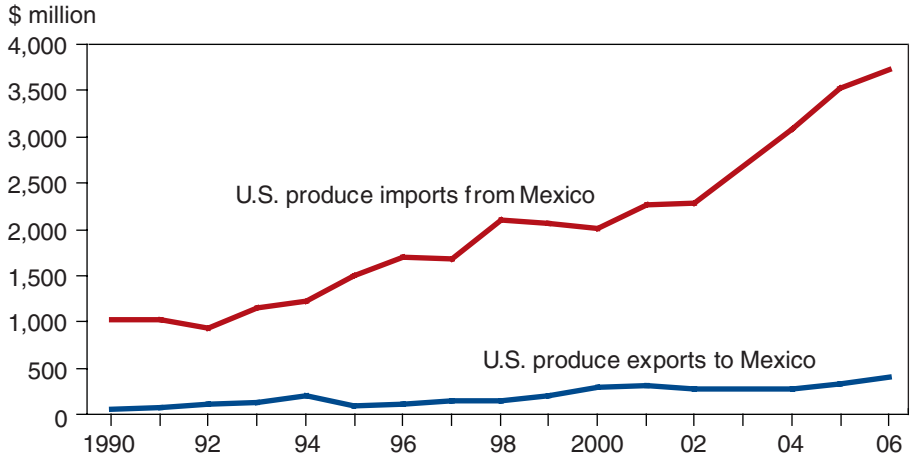
The vibrant Mexican produce industry has taken advantage of NAFTA and improved production, investments, and marketing to increase fresh produce exports to the United States. The strong export growth of Mexican produce is also aided by successful phytosanitary negotiations. For example, after Mexico gained year-round access for its avocados to be shipped to 47 U.S. States in 2005 (California, Florida, and Hawaii were off limits to Mexican avocados until February 1, 2007, because of phytosanitary reasons), Mexico became the dominant supplier for U.S. avocado imports, accounting for 51 percent of the U.S. market by weight, compared with Chile's 43 percent in 2005. Both Mexico and Chile ship their avocados during California's off-season. The value of U.S. fresh fruit imports from Mexico swelled from nearly $218 million in 1990-02 to $939 million in 2004-06, while fresh vegetable imports surged from $775 million to nearly $2.5 billion. In comparison, Mexico is a relatively small market for U.S. fresh produce exports despite rapid growth over the past decade, with a 9-percent market share ($232 million) of U.S. exports for fresh fruit and a 6-percent share ($99 million) for fresh vegetables in 2004-06 (fig. 12).

Figure 11
U.S. fresh produce trade with Canada



Source: Prepared by USDA, Economic Research Service, using data from USDA, Foreign Agricultural Service, *FASOnline*.

Figure 12
U.S. fresh produce trade with Mexico



Source: Prepared by USDA, Economic Research Service, using data from USDA, Foreign Agricultural Service, *FASOnline*.

Technology Developments Advance Perishable Produce Trade

Remarkable technological innovations in production, storage, packaging, and transportation over the last two decades enabled fresh fruit and vegetables to be shipped to consumers globally in a timely manner and at an affordable price. A typical example is the introduction of the controlled atmosphere techniques in maritime transport around 1980. With these techniques, perishable foods, such as fresh produce, are shipped in an atmosphere in which oxygen, nitrogen, carbon dioxide, temperature, and humidity are maintained at optimal levels to preserve food quality during shipment.

These technologies allow year-round global availability of a greater variety of fresh fruit and vegetables, overcoming seasonality and smoothing price fluctuations. Thus, fresh produce suppliers, such as Chile and Mexico, have increasingly taken advantage of strong U.S. demand and seasonal gaps, with a resulting increase in U.S. imports. In recent years, the trend has been for imports to come from even greater distances, including Africa and other South American countries. However, geographic distance, which affects transport costs, is still a factor. The two foremost suppliers of U.S. fresh produce, excluding bananas—Chile and Mexico—have export advantages of both seasonal difference and relative proximity to the United States.

Despite new innovations, substantial phytosanitary problems in many parts of the world prevent countries from trading with the United States. For example, APHIS generally uses a bilateral "positive list" approach, excluding all commodities from all sources except for individual products from specific sources approved for import. The import protocols to meet the strict U.S. phytosanitary standards usually require exporting countries to make substantial public and private investments. For example, an import protocol to decrease the likelihood of the Mediterranean fruit fly's entering the United States usually requires an importing country to conduct frequent field surveys and requires producers to build special packinghouses.

Conclusions

Since the early 1990s, overall U.S. consumption of fresh produce has risen continuously, while imports have satisfied an increasing share of this demand. For most products, imports have supplemented domestic production with the notable exception of garlic. U.S. consumers have benefited from imports because prices for most imported fresh produce have been relatively stable. Thus, imports have allowed consumers to eat more fruit and vegetables and enjoy year-round access to fresh produce.

The United States relies on distinct subsets of suppliers. Mexico and Canada have gained by way of NAFTA, the Southern Hemisphere countries supply off-season fresh fruit, and equatorial countries provide banana imports. Besides season/climate differences, labor costs may be lower in other countries for labor-intensive commodities like fresh produce. Transport and packaging technologies have improved, but phytosanitary considerations still limit potential imports. Consumer demand for greater variety of fresh produce has gone hand-in-hand with year-round availability of fresh fruit and vegetables and with an increase in the number of people who can afford them.

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