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Changing Distribution Patterns in the U.S. Fresh Produce Industry: Mid/Late-70s to Mid/Late-90s

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SECTION 1

Introduction

The fresh fruit and vegetable production and distribution system has been one of the most dynamic food marketing channels in the U.S. agricultural economy over at least the past 15 years. Major structural shifts have occurred in virtually every sector.

Prompted by encouragement from federal and state agencies and national health organizations, per capita consumption of nearly all major commodities has increased, and marketers have responded aggressively to this greater consumer demand. Retail space allocated to fresh fruits and vegetables has expanded. The number of products typically carried in stores and their duration in the year when these products are available also have increased. Fueling these developments, wholesalers now offer a considerably wider range of value-added products and services. Producers, too, have developed new, more flavorful varieties and have sought more efficient methods of distribution in an effort to keep up with higher demand and to gain a competitive edge.

Overarching all these changes is increasing firm consolidation at all levels, changing the structure of the industry and the way individual firms do business.

Study Goals and Objectives

The overall goal of this report was to estimate and describe the current product flows in the conventional fresh produce marketing channels in the mid-late 1990s. By doing so, the report provides information useful to understanding the changing structure of the fresh produce industry as we approach the year 2000.

SECTION 2

Methodology

The research upon which this report was based was carried out with a distinct two-part method. First, product flows and changes in operating practices in the U.S. fresh fruit and vegetable channels were estimated using secondary data from a number of principal sources. Data series from several agencies of the U.S. government, including the Department of Agriculture, the Bureau of the Census and the Bureau of Labor Statistics provided most of the historical time series. Other traditional sources of information on the fresh produce industry included academic literature, various trade magazines and directories.

In addition, the Cornell/Produce Marketing Association *FreshTrack* industry research project contributed industry data unavailable until recent years. Although not a complete census of produce industry operators, this project has extensively surveyed the four major sectors of the industry—grower shippers, wholesalers, retailers and food service operators—and assembled two years of primary, structural, operational and performance data from individual firms. The authors believe this new information constitutes the largest and most contemporary data source available on the fresh produce industry.

Were compiled these data from many different sources and because not all years correspond precisely, it is not possible to provide these estimates for a single year. Therefore, the authors chose to describe the fresh produce system for an “average” year in the mid- to late-1990s. At each level in the system, the authors used the most recent data available at the time of publication were used.

SECTION 3

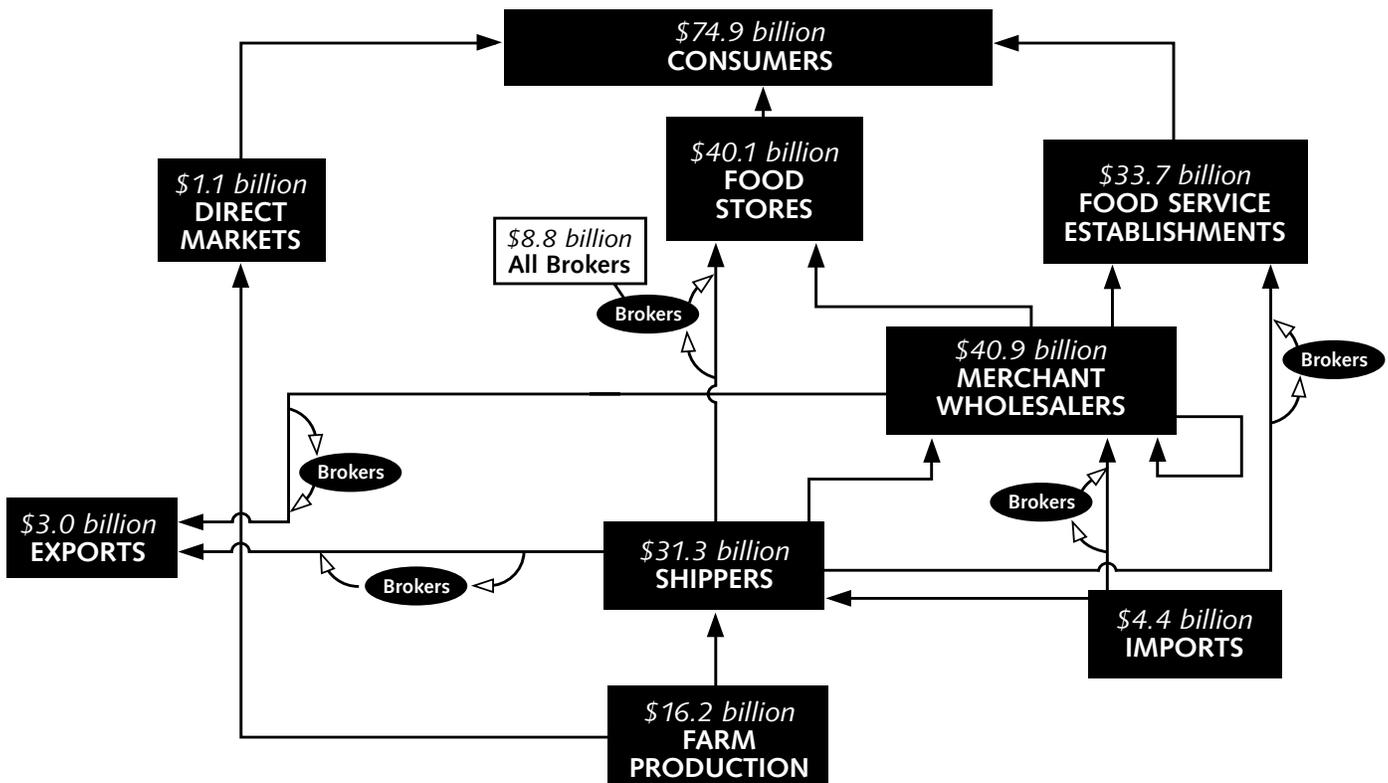
The Fresh Produce Distribution System

The volumes and values of fresh fruits and vegetables flowing through the distribution channels have grown significantly in recent years. These changes create both challenges and opportunities for participants in various parts of the system and influence virtually the entire system. Figure 3.1 is a simplified schematic of the marketing channels through which fresh produce flows. The figure depicts the channels through which fresh fruits and vegetables may move between farmer and consumer. Further, the authors ascertained approximate values of the fresh fruits and vegetables flowing through these channels in the mid- to late-1990s.

The sections below elaborate the trends and information exhibited in Figure 3.1. In a real sense, Figure 3.1 serves as a roadmap for the rest of the report. The subsequent sections describe each of the major marketing channels, exhibited as boxes in the figure. In each section, this report briefly describes structural trends and discuss the steps used to estimate produce sales flows. The report begins with farm production information and trace the flow of fresh produce through to retail sales and per capita consumption.

FIGURE 3.1

U.S. Fresh Fruits and Vegetables Marketing Channels, Mid- to Late-1990s



Farm Production

Under the definition of the U.S. Bureau of the Census, a farm is “a place which produced and sold, or normally would have produced and sold, \$1,000 or more of agricultural products.” This very broad definition includes a multitude of small or part-time farms frequently selling directly to the consumer. The census also reports operations in different states and in non contiguous counties as separate farms, which underreports the size of most of the primary producers. The census also does not distinguish between farms producing for the fresh market versus those growing for processing.

However, given these constraints, the census provides exhaustive data that can be used to determine direction of current trends. For example, two pieces of information gleaned from recent census years are the continuing overall decline in fruit and vegetable farm numbers and concurrent increase in fruit and vegetable sales and an increase in farm size.

Number of Fruit and Vegetable Farms and Market Value of Production¹

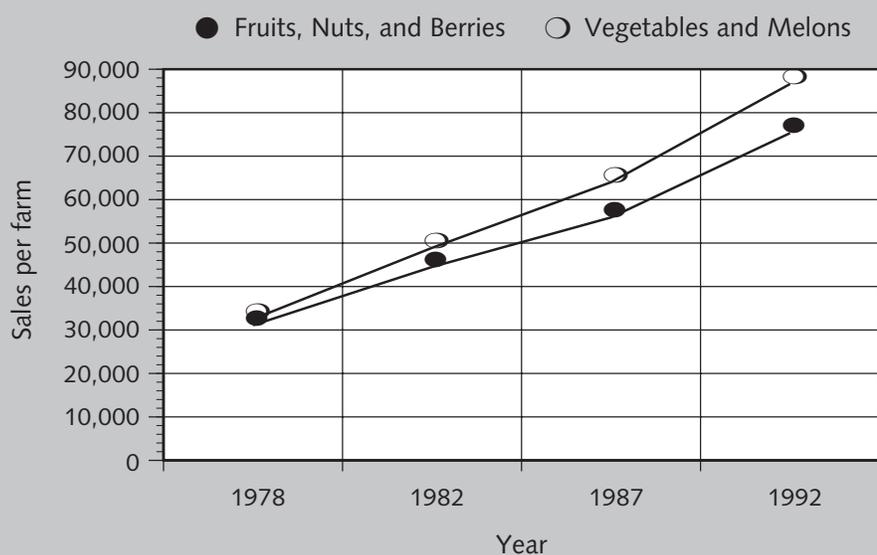
	Fruit, Nut and Berry Orchards	Vegetable and Melon Farms	Fruit, Nut and Berry Sales ²	Vegetable and Melon Sales ³
			-\$1,000-	-\$1,000-
1978	139,765	82,250	4,344,222	2,677,764
1982	123,663	69,109	5,506,247	3,379,270
1987	120,434	60,819	6,738,302	3,894,682
1992	116,207	61,969	8,753,439	5,366,129

¹ includes fruits and vegetables for fresh and processed production

² from fruit, nut and berry farms

³ from vegetable and melon farms

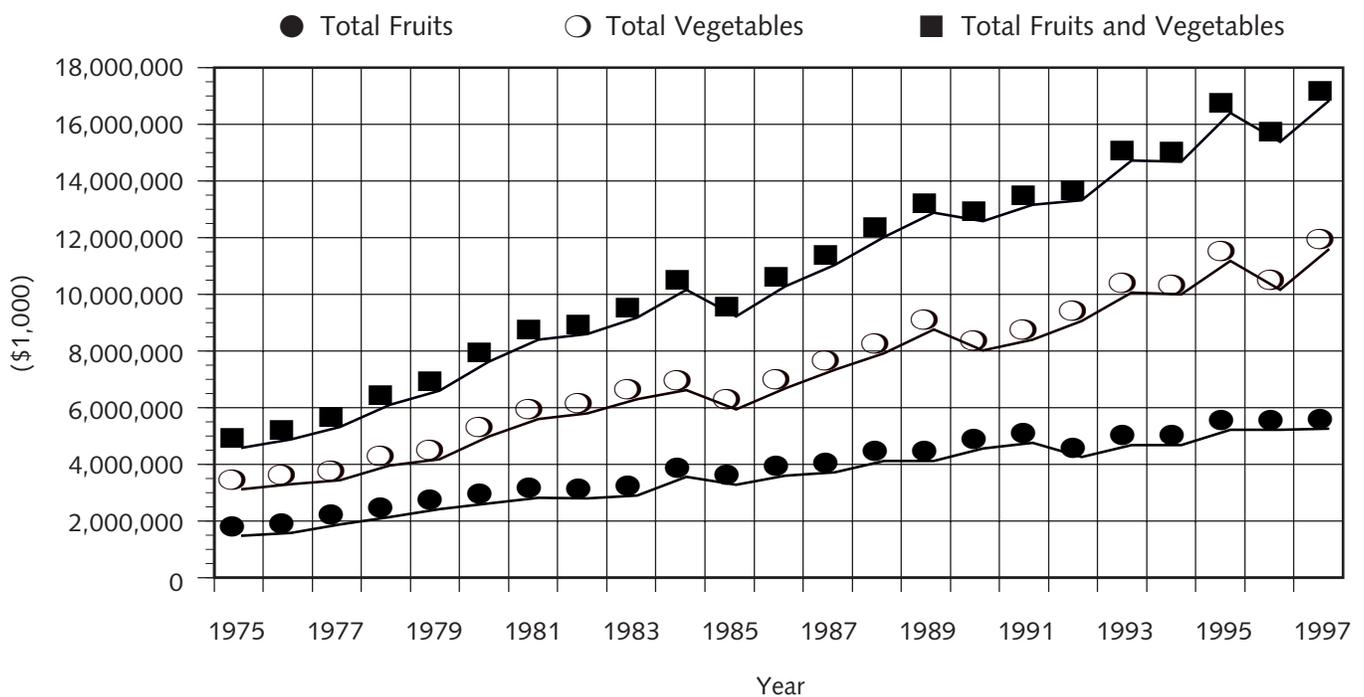
Source: U.S. Department of Commerce, *Agricultural Census*, various years.



Source: U.S. Department of Commerce, *Agricultural Census*, various years

FIGURE 3.2

Value of Annual Production of Fruits and Vegetables for Fresh Use, 1975–1997



Source: USDA, Annual Summaries of Non-Citrus Fruits and Nuts; Citrus Fruits; and Vegetables

The lead agency for gathering and reporting data on farm production is the U.S. Department of Agriculture. Numerous changes in reporting policies for fresh fruits and vegetables have occurred in the agency over the past 20 years, but at this writing, in the mid- to late-1990s, USDA reported farm level data on 37 fresh fruits and 32 fresh vegetables and melons. For further estimation, three-year averages were used to smooth out variations in individual production years. In this section, farm gate values were collected to describe the flow of fresh produce produced at farm or grower level.

The value of total fresh produce production has increased over the past 20 years and is illustrated in Figure 3.2, which graphs the yearly value of production for fresh fruits and fresh vegetables from 1975 to 1997.

The annual average value of production, using a three-year average, for all fruits and vegetables for fresh use in 1995-1997 in the United States was \$16.2 billion (Table 3.1). During this time, fresh fruit represented 32 percent of the total value, and vegetables and melons accounted for the other 68 percent. In the past 20 years, since 1975-1977, the value of fresh fruit and vegetable production in the U.S. has increased 329 percent. The top three fruits in value of production in the mid- to late-1990s were apples (\$1,329 million), strawberries (\$723 million) and oranges (\$654 million). The top three vegetables were head lettuce (\$1,207 million), tomatoes (\$1,035 million) and potatoes (\$898 million).

TABLE 3.1

Value of Annual Production of Fruits and Vegetables for Fresh Use: 1975-1977, 1985-1987 and 1995-1997 Averages

	1995-1997	1985-1987	1975-1977		1995-1997	1985-1987	1975-1977
Non-citrus fruits^{1,4}		<i>-\$1,000-</i>		Vegetables and melons^{3,4}	<i>-\$1,000-</i>		
Apples	1,329,496	759,219	451,737	Artichokes	65,000	NA	12,397
Apricots	15,065	12,323	3,344	Asparagus	120,435	93,462	33,049
Avocados	251,686	165,731	79,014	Beans	162,678	NA	80,912
Bananas	5,202	2,923	847	Beets	6,261	1,201	6,315
Bush berries				Broccoli	410,865	182,653	42,811
<i>Blueberries</i>	70,447	29,622	8,539	Brussels sprouts	20,437	NA	12,635
<i>Raspberries</i>	3,724	1,361	1,051	Cabbage	261,583	181,063	127,487
<i>Strawberries</i>	723,407	425,351	147,045	Cantaloupes	389,784	197,232	109,335
<i>Other berries</i>	1,243	445	238	Carrots	397,126	206,503	112,635
Cherries	171,544	82,600	43,008	Cauliflower	194,301	161,234	42,157
Cranberries	14,584	16,037	5,636	Celery	259,890	199,808	130,812
Dates and figs	22,522	19,600	8,732	Corn	390,671	203,693	118,165
Grapes	551,560	323,868	184,992	Cucumbers	179,284	104,720	52,903
Kiwifruit	14,523	19,885	NA	Eggplant	17,310	NA	7,221
Mangos and Guavas	2,811	2,750	NA	Escarole and endive	13,714	NA	15,003
Nectarines	73,101	69,945	31,124	Garlic	199,517	NA	15,582
Papayas	18,015	10,001	6,178	Honeydew melons	92,997	65,493	24,254
Peaches	278,898	205,697	161,335	Lettuce			
Pears	157,246	121,375	53,505	<i>Head</i>	1,207,325	786,863	414,881
Pineapples	64,975	50,936	NA	<i>Leaf</i>	266,618	NA	NA
Plums	96,522	86,910	42,479	<i>Romaine</i>	183,037	NA	NA
Prunes	5,790	6,622	9,599	Mushrooms	621,310	430,973	133,002
Miscellaneous	143,552	80,865	33,229	Onions	621,233	426,720	228,967
Total non-citrus	\$4,015,913	\$2,494,066	\$1,271,632	Peppers	524,922	226,450	86,926
Citrus fruits²				Potatoes	897,708	625,573	453,534
Grapefruit	202,669	239,393	71,980	Radishes	15,434	14,393	NA
Lemons	239,480	186,136	53,881	Spinach	56,980	14,135	12,092
Limes	3,856	20,657	5,966	Squash	33,378	27,090	NA
Oranges	653,636	503,143	180,382	Sweet potatoes	203,862	131,928	111,557
Tangelos	6,868	12,019	7,131	Tomatoes	1,034,955	783,833	407,086
Tangerines	100,310	64,057	20,455	Watermelons	313,992	179,966	91,372
Temples	4,615	9,085	8,092	Miscellaneous	1,813,130	1,303,701	397,888
Total citrus	\$721	\$1,034,491	\$347,887	Total vegetables and melons	\$10,975,737	\$6,503,687	\$3,280,977
Total fruits	\$5,227,883	\$3,529,249	\$1,640,655	Total fruits, vegetables and melons	\$16,203,620	\$10,195,558	\$4,921,632

¹ U.S.D.A., Economic Research Service, *Non-citrus Fruits and Nuts, Annual Summary, 1974-1997*² U.S.D.A., Economic Research Service, *Citrus Fruits, Annual Summary, 1974-1997*³ U.S.D.A., Economic Research Service, *Vegetables, Annual Summary, 1974-1997*⁴ U.S.D.A., Economic Research Service, *Farm Cash Receipts, 1974-1997*

TABLE 3.2

Value of Annual Imports of Fruits and Vegetables for Fresh Use: 1975-1977, 1985-1987 and 1995-1997 Averages

	1995-1997	1985-1987	1975-1977		1995-1997	1985-1987	1975-1977
Non-citrus fruits	-\$1,000-			Vegetables	-\$1,000-		
Apples	94,969	65,280	13,868	Asparagus	66,109	15,360	2,111
Apricots	2,040	1,248	21	Beans	29,384	13,234	1,974
Avocados	22,077	1,914	348	Beets	1,550	112	19
Bananas	1,189,198	765,118	281,283	Brussels sprouts	3,855	4,180	236
Bush berries				Cabbage	8,573	3,345	974
<i>Blueberries</i>	12,828	6,626	1,886	Carrots	25,841	12,624	2,737
<i>Raspberries</i>	14,374	15,368	1,425	Cauliflower	129,969	2,335	98
<i>Strawberries</i>	42,421	10,658	5,945	Celery	8,360	2,059	127
<i>Other berries</i>	22,168	6,236	1,150	Corn	4,409	1,535	47
Cantaloupes	108,325	36,718	15,895	Cucumbers	114,975	70,351	12,400
Cherries	3,480	1,837	74	Eggplant	19,404	8,490	2,089
Dates and figs	12,572	113	13	Escarole and endive	5,357	6,563	1,143
Grapes	353,764	181,394	12,381	Garlic	25,496	15,970	6,083
Guavas and mangoes	114,735	27,552	4,788	Head lettuce	12,089	4,767	395
Honeydew melons	48,383	19,965	3,089	Okra	11,354	4,949	1,052
Kiwifruit	23,352	13,720	NA	Onions	138,341	48,542	10,759
Papayas	24,210	546	115	Peas	33,853	21,632	3,716
Peaches	32,341	22,078	1,428	Peppers	238,429	81,708	14,459
Pears	37,207	19,758	2,387	Potatoes	202,630	39,674	2,517
Pineapples	60,869	18,093	4,849	Radishes	7,974	4,068	806
Plums	18,427	10,413	580	Squash	80,402	27,187	3,703
Watermelons	45,912	15,725	7,048	Tomatoes	590,551	225,011	96,013
Others	25,471	7,045	5,551	Others	193,119	117,318	24,316
Total non-citrus	2,305,122	1,247,405	364,665	Total vegetables	1,952,026	731,015	187,775
Citrus fruits							
Grapefruit	1,344	250	2,396				
Lemons	5,013	3,549	16				
Limes	9,034	4,633	1,841				
Oranges	50,845	10,785	8,021				
Tangerines	1,537	5,371	NA				
Others	26,169	367	309				
Total citrus	93,981	24,955	12,582				
Total fruits	2,399,102	1,272,360	377,246	Total fruits and vegetables	4,351,128	2,003,375	565,022

Source: U.S.D.A., Economic Research Service, *Foreign Agricultural Trade of the United States*, Calendar Year Summary, 1974-1997

TABLE 3.3

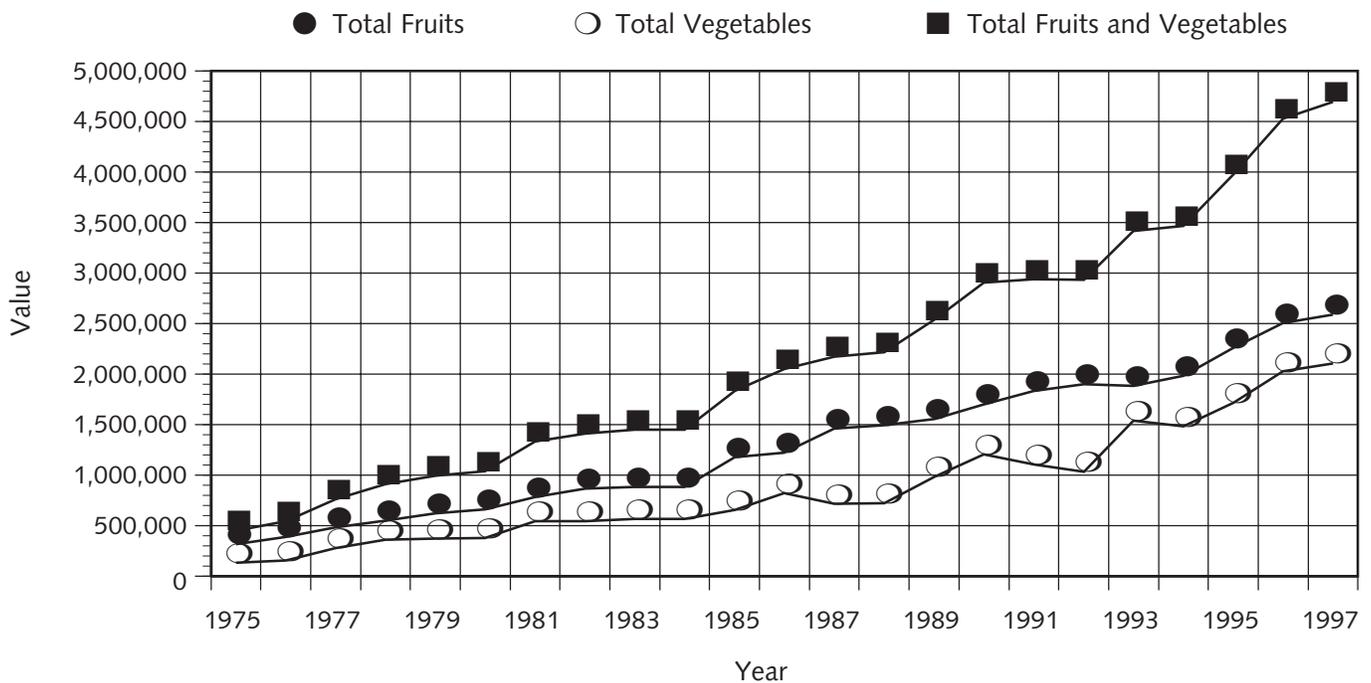
Value of Annual Exports of Fruits and Vegetables for Fresh Use: 1975-1977, 1985-1987 and 1995-1997 Averages

	1995-1997	1985-1987	1975-1977		1995-1997	1985-1987	1975-1977
Non-citrus fruits		-\$1,000-		Vegetables and melons		-\$1,000-	
Apples	388,685	97,133	44,949	Artichokes	2,494	NA	NA
Avocados	10,825	12,542	NA	Asparagus	56,404	15,821	4,403
Bush berries				Beans	22,520	3,499	2,415
<i>Blueberries</i>	8,921	4,907	NA	Broccoli	89,101	12,761	NA
<i>Strawberries</i>	91,333	21,781	7,681	Brussels sprouts	2,941	411	NA
<i>Other berries</i>	6,212	4,925	6,191	Cabbage	17,816	1,782	5,715
Cantaloupes	25,515	4,871	NA	Carrots	45,944	10,760	6,411
Cherries	137,615	29,059	5,331	Cauliflower	66,417	8,662	NA
Cranberries	8,178	NA	NA	Celery	48,165	15,856	12,509
Dates and figs	11,988	NA	NA	Corn	22,565	6,690	NA
Grapes	300,277	95,685	55,092	Cucumbers	15,939	2,504	2,735
Guavas and mangoes	19,382	NA	NA	Eggplant	4,744	NA	NA
Honeydew melons	24,772	12,152	7,362	Garlic	11,338	3,344	2,463
Kiwifruit	8,739	18,158	NA	Head lettuce	153,265	40,361	30,794
Papayas	17,772	5,436	7,271	Mushrooms	21,107	2,777	NA
Peaches	76,363	16,100	11,539	Onions	74,556	19,779	22,709
Pears	79,601	18,353	11,275	Peas	7,433	NA	NA
Pineapples	4,890	NA	NA	Peppers	49,202	7,569	6,597
Plums	56,513	21,113	9,428	Potatoes	81,623	14,890	50,576
Watermelons	32,024	3,545	3,708	Spinach	10,790	NA	NA
Others	5,853	11,280	3,196	Tomatoes	110,934	39,208	30,786
Total non-citrus	1,315,460	377,041	173,022	Others	85,109	33,820	28,151
Citrus fruits				Total vegetables	1,000,315	240,495	206,445
Grapefruit	244,489	132,576	61,975				
Lemons	119,345	93,863	77,415				
Limes	2,185	1,519	744				
Oranges	326,885	219,728	114,596				
Tangerines	13,455	7,111	4,074				
Temples	14,203	6,242	NA				
Others	5,340	5,980	223				
Total citrus	725,903	467,020	259,028				
Total fruits	2,041,363	844,060	432,050	Total fruits and vegetables	3,041,678	1,084,555	638,495

Source: U.S.D.A., Economic Research Service, *Foreign Agricultural Trade of the United States*, Calendar Year Summary, 1974-1997

FIGURE 3.3

Value of Imports of Fresh Fruits and Vegetables, 1975-1997

Source: USDA, *Foreign Agricultural Trade of the United States*

Imports and Exports

Most fresh fruit and vegetable imports and exports are handled by produce shippers, wholesalers, or dedicated importers and exporters whose primary form of business is in global fresh produce trading. *The Blue Book, 1997*, an extensive industry credit directory, lists 753 firms that export fresh produce and 660 firms that import fresh produce. Of these, 203 of the 753 list themselves primarily as exporters and 278 of 660 primarily as importers.

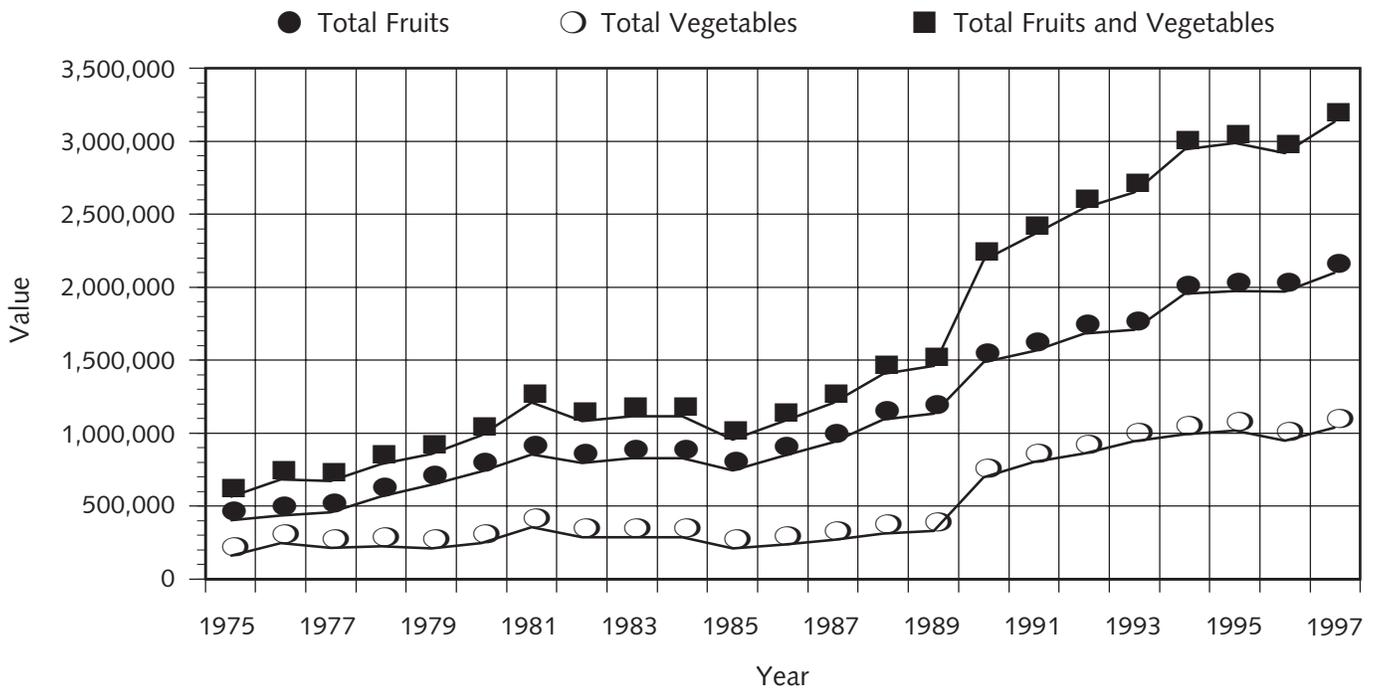
Values of both imports and exports of fresh fruits and vegetables have risen over the past two decades. From values of less than \$1 billion dollars in 1975, imports of fresh fruits and vegetables rose to \$4.4

billion (Table 3.2) by the mid- to late-1990s and exports of fresh produce for the same period rose to \$3.0 billion (Table 3.3). In the mid- to late-1990s, the leading fresh produce imports were bananas (\$1.2 billion), tomatoes (\$591 million), and grapes (\$354 million). The leading fresh produce exports during the mid- to late-1990s were apples (\$389 million), oranges (\$327 million) and grapes (\$300 million). The annual values of imports and exports are illustrated in Figures 3.3 and 3.4 respectively.

Retailers and food service handlers rarely have the management time or the expertise to source global produce themselves. Therefore, values for produce imports enter the system primarily at the shipper and wholesaler levels. Little data are available describing what portion of imports wholesalers or shippers

FIGURE 3.4

Value of Exports of Fresh Fruits and Vegetables, 1975-1997



Source: USDA, *Foreign Agricultural Trade of the United States*

purchase. However, an examination of *Blue Book 1997* companies revealed that 63 percent of importers also included shipping activities while the remaining 37 percent of importers included wholesaling activities. Using this relationship, the \$4.4 billion of imports were assigned as purchases to the following: shippers — \$2.8 billion (63 percent of imports); wholesalers — \$1.6 billion (37 percent of imports).

Exports leaving the United States marketing channels exit primarily from shipper levels, however, many wholesalers also export produce. *FreshTrack* data report export levels as percentages of sales for both shippers and wholesalers and are presented in those sections respectively.

Shipping Point Marketing Firms

Movement from shipping points into the various channels of distribution is complex. Information from the *FreshTrack* project reveals more complexity than perhaps was observed 40 years ago (Manchester, 1964) because of higher demands from consumers and more marketing functions needed to satisfy these demands.

To arrive at the total value of all fresh produce sent into the U.S. fresh produce distribution system by shipping-point marketing firms, several calculations and approximations are required. Essentially, the value of all packing, handling and selling charges must be determined and added to the farm value of fresh produce, as reported above. To these values, it is necessary to add the shippers' portion of imports and

add the handling and selling charges to these amounts to arrive at shippers' total sales. Exports reported by shippers then must be subtracted to arrive at the value of all produce marketed in the United States.

Shipping-point sales data, or free-on-board sales (f.o.b.) are difficult to estimate for several reasons. First, the industry employs a wide variety of mechanisms to transfer its merchandise from farm to shipping point. In some cases, the farm producer is integrated vertically into the sales company. This particular firm type known as a grower-packer-shipper is the dominant model in the produce industry. Other producers are more independent. They may transfer their commodities to a secondary entity to cool, sort, grade and pack the commodity and subsequently, these packages are sold to a wholesale or retail customer by a third entity, the shipper. The packing and selling charges vary considerably, depending on the type of organizational structure that prevails.

Secondly, the USDA does not collect comprehensive information on the separate packing and selling charges for each individual commodity for which they collect production data. However, they do maintain records on a limited number of selected commodities. From these data, from estimates of packing and selling charges from other studies (How, 1991) and from personal conversations with individual packers and shippers, the researchers have estimated that the average packing and selling charge that may apply to the raw product cost across all commodities is about 75 percent. Thus, applying this standard to \$15.1 billion (the farm value of all fresh fruits and vegetables, minus \$1.1 billion in estimated direct marketing sales to consumers) and to \$2.8 billion of imports sold through shippers produces a value of approximately \$31.3 billion.

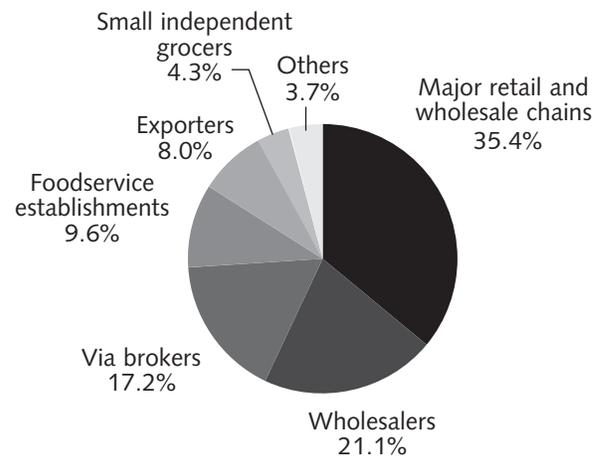
Sales

Shippers' sales may be apportioned to various marketing channels according to information from *FreshTrack 1998*. Grower/shipper respondents from

FreshTrack 1998 reported percent of sales to customers (Figure 3.5). Major retail and wholesale chains receive the largest portion of sales, 35.4 percent of grower/shipper sales. Wholesalers take 21.1 percent and brokers handle 17.2 percent of sales while 9.6 percent is sold to food service establishments. Eight percent is exported. A small portion, 4.3 percent is sold to small, independent grocers and the remainder, 3.7 percent to various other accounts.

FIGURE 3.5

Grower/Shipper Sales to Customer Types



Source: McLaughlin, et al., *FreshTrack 1998*

As a result of selling directly to the retail outlets, growers shippers have taken on more of the marketing functions performed in the past by the wholesaling system, which includes repackers, wholesalers and brokers. Retailers also pass back to the wholesaling system and shippers some of the marketing functions they used to perform themselves, such as trimming, cut-up, and consumer packaging.

Performing these added marketing functions may increase the costs in transforming the product from "farm gate" to "shipping point." Shipping-point firm activities may now include PLU or UPC coding, packing in display-ready boxes and consumer packs, and shipping directly to chain warehouses.

Wholesale Distribution Channels

The importance of the wholesale produce distribution channels frequently has been overlooked. These channels provide critical functions, however, including handling, transportation, storage, importing and exporting, and distribution. Close to half of all fresh produce distributed in the United States moves through the wholesale distribution system, consisting of produce packers, field buyers, distributors, brokers, repackers, and various types of receivers located both off and on terminal markets (McLaughlin, et al., 1998). This system connects producers on one end of the system with retail outlets and food service establishments on the other end. Like all other distribution systems, the purpose of this fresh produce distribution system may be described as:

“...delivering products and title to them to consumers at the right place, at the right time, and in the right amounts,...” (Boone and Johnson, 1977).

The term “wholesalers” has two uses. In its broad definition, it refers to a substantial segment of the produce marketing system. It encompasses virtually all types of produce handlers and operators between the shipper’s sales desk and the retail sector, whether supermarket or food service. Included are various types of commission merchants, brokers, distributors, terminal and off-market wholesalers, repackers, and importers and exporters. This broad usage is consistent with the term established by the USDA in its 1964 classic produce wholesale study led by Alden Manchester, *The Structure of Wholesale Produce Markets*.

In its narrowest definition, however, the term “wholesalers” may refer specifically only to produce handlers who physically receive and warehouse product. Whenever possible, this report will distinguish between the two definitions.

U. S. Bureau of the Census definitions distinguish wholesale establishments that take title or ownership from those that do not. The most recent *Census of Wholesale Trade* in 1992 reports approximately 6,000 fresh produce wholesale establishments. The majority of them are merchant wholesalers, which take title to the product that they handle (Table 3.4). Merchant wholesalers include such subcategories as distributors, wholesalers, repackers, importers and exporters. Agents, brokers, and commission merchants are those who do not take ownership of the product. Produce sales alone from all types of wholesalers that specialize in fresh fruits and vegetables totaled \$37 billion in 1992.

Approximately 4,000 other wholesalers also trade, to some extent, in fresh fruits and vegetables. They include general-line grocery wholesalers, food service distributors, frozen food wholesalers, and commodity wholesalers that carry fresh produce in addition to their main products. These other wholesalers account for 40.3 percent of the total number of establishments wholesaling fresh produce but account for only \$6.9 billion, or 15.8 percent of the total sales of fresh produce in the U.S. wholesaling system (Table 3.4). Estimates for the fresh fruit and vegetable wholesale trade for 1995–1997 are calculated using the 1992 Census figures, updated by a weighted average Producer Price Index (PPI) of 113.2 for fresh fruit and vegetables (Table 3.5).

TABLE 3.4

Fresh Fruits and Vegetables Wholesale Trade, 1992

Wholesaler types	# of Establishments	% of Establishments	Produce Sales -\$1,000-	% of Total Sales
Fresh fruits and vegetables wholesalers	6,003	59.7	36,969,068	84.2
Merchant wholesalers	5,293	-	30,414,707	-
Agents, brokers, & commission merchants	710	-	6,554,361	-
Other wholesalers trading fresh produce	4,048	40.3	6,931,439	15.8
Total establishments trading in fresh produce	10,051	100.0	43,900,507	100.0

Source: U.S. Bureau of the Census, 1992 *Census of Wholesale Trade-Subject Series***TABLE 3.5**

Estimates of Fresh Fruits and Vegetables Wholesale Trade, 1995-1997

Wholesaler types	Produce Sales -\$1,000-	% of Total Sales
Fresh fruits and vegetables wholesalers	41,838,633	84.2
Merchant wholesalers	34,420,931	-
Agents, brokers, & commission merchants	7,417,702	-
Other wholesalers trading fresh produce	7,844,448	15.8
Total establishments trading in fresh produce	49,683,081	100.0

Wholesale Channel Business Functions

Business functions performed within the traditional wholesale distribution system typically include physically handling produce shipments and reselling to customers' orders. Functions also normally include distribution activities similar to wholesaling, except that the distributor does not physically handle the product but rather coordinates the shipments from suppliers to customers. Typically, the distributor owns the product. Brokers provide a service activity for sellers or buyers but do not take ownership of the produce. Instead, they facilitate sales or purchases for others for a brokerage fee. Their primary function is to negotiate orders for a number of buyers or sellers. Other major wholesale system activities include repacking, importing and exporting. A description of traditional businesses within the produce wholesale distribution system is below.

Produce Wholesalers and Distributors

As mentioned above, produce wholesalers, in the most limited definition, are businesses that purchase produce on their own behalf, receive the produce shipments, warehouse merchandise and then resell it. They are located primarily in their market areas with their customers and receive shipments from production areas. Market areas may be as small as one city or may be as large as the distance a trucker can travel and deliver produce in one day. Distributors differ slightly from wholesalers in that they generally do not handle produce from warehouses. They purchase produce in full truckloads but, rather than delivering to warehouses for the produce to be divided into lots, they sell and deliver to customers directly from the truck shipments.

Brokers

Brokers negotiate sales or purchases on behalf of a customer. The customer could be either a shipper attempting to sell produce or a buyer attempting to purchase produce. The broker often specializes in information about market or production areas otherwise inaccessible to a shipper or a principal. Selling brokers specifically search for buyers on behalf of shippers and act as a market informant, gathering orders from various buyers and then often arranging for shipment from the shipper customer. Buying brokers act on behalf of buyer customers, negotiating purchases from production areas.

Repackers

These produce handlers take product in bulk form, usually tomatoes, onions, and potatoes, and repack it into consumer packages. Repackers also may store and ripen produce, especially tomatoes.

Importers and Exporters

Importers and exporters act as their own agents, purchasing or selling to foreign countries and usually taking title to the product.

Food service Wholesalers and Distributors

Although food service wholesalers and distributors handle a number of other products in addition to produce to more fully serve their food service customers, they are an integral part of the produce marketing channel. First, they handle a significant portion of the produce flowing through the system. Second, they are the primary source of produce for many food service operators.

Sales

Wholesaler sales for the mid- to late-1990s were estimated by inflating the sales data reported by the Census Bureau by a weighted average PPI for fresh fruits and vegetables (see Table 3.5). Produce sales negotiated by brokers were estimated at \$8.8 billion and are reported separately in Figure 3.1. The remainder, merchant wholesaler sales, were estimated at \$40.9 billion.

Overall, wholesaling system *FreshTrack 1997* respondents reported that 33.5 percent of their produce sales go to major retail and wholesale grocery chains (Figure 3.6). Therefore, retail and wholesale grocery chains still account for the largest proportion of wholesaler sales, despite trade concern about a trend toward sales to major retail accounts disappearing. Substantiating reports of a growing food service

customer base is the significant proportion of wholesaler sales to the food service industry, 27.2 percent, coinciding with the growth in consumer food expenditures away from home.

Other wholesalers and other brokers account for 22.2 percent of sales, and small, independent grocers account for 13.0 percent of wholesaler sales. Other customers including the military, processors and exporters total 4.2 percent of overall wholesaler sales. When exports are calculated separately, they account for 1.1 percent of sales.

Food Retailers

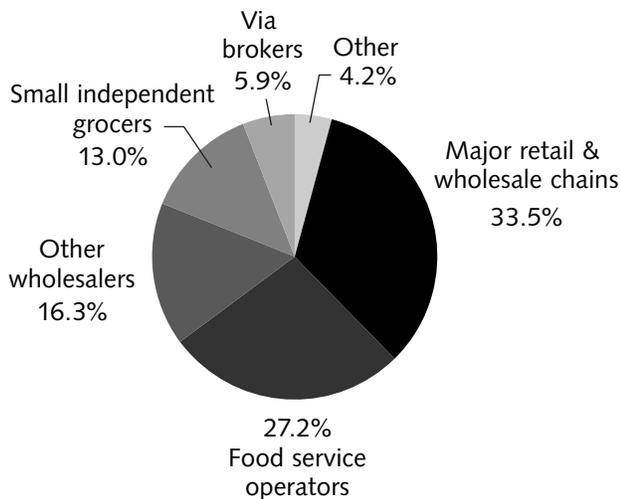
Grocery stores sell most of the food consumers purchase. The U.S. Department of Commerce reports numbers and sales of supermarkets, general-line groceries, convenience stores and delicatessens under the category "grocery stores." The *Census of Retail Trade, 1992*, listed 133,263 grocery stores, 55.0 percent of them supermarkets and general-line grocery stores (U.S. Department of Commerce, 1992(c)). For this purpose, a supermarket is a grocery store with \$2 million or more in annual sales.

In addition to grocery stores, other food stores specialize in such food items as fruits and vegetables, meat, retail bakeries, candy and dairy products. Although there was an extensive array of these small specialty shops, they accounted for only a limited volume of food consumed in the United States (U.S. Department of Commerce, 1992(c)).

Continued →

FIGURE 3.6

Wholesaler Sales to Customer Types



Source: McLaughlin, et al., *FreshTrack 1997*

Number of Food Store Establishments

	1977	1982	1987	1992
Food Stores	251,971	176,219	190,706	180,568
Grocery Stores	178,835	128,494	137,584	133,263
Supermarkets & general line grocery stores	na	na	83,958	73,357
Convenience Stores	na	na	49,514	53,783
Delicatessens	na	na	4,112	6,123
Other Food Stores	73,136	47,725	53,122	47,305
Fruit & Vegetable Markets	7,853	2,943	3,271	2,971
All Other Food Stores	65,283	44,782	49,851	44,334

Source: U.S. Department of Commerce, *Census of Retail Trade*, various years na=not available

Sales from Food Stores

	1977	1982	1987	1992
			-\$1,000-	
Food Stores	158,248,392	240,519,746	301,846,804	367,198,584
Grocery Stores	147,758,535	226,609,085	285,481,116	350,558,184
Supermarkets & Other General-Line Grocery Stores	na	na	256,105,784	314,132,652
Convenience Stores	na	na	27,805,074	34,649,002
Other Grocery Stores	na	na	1,570,258	1,776,530
Other Food Stores	10,489,857	13,910,661	16,365,688	16,640,400
Fruit & Vegetable Markets	1,088,102	1,329,635	1,802,222	1,809,287
All Other Food Stores	9,401,755	12,581,026	14,563,466	14,831,113

Source: U. S. Department of Commerce, *Census of Retail Trade*, various years

Supermarkets and Other General-Line Grocery Stores

In 1996, an estimated 127,000 grocery stores in the United States generated a sales volume of \$425.7 billion (Table 3.6). Supermarkets, defined as grocery stores whose annual sales exceed \$2 million, accounted for 76 percent of this total or \$323.2 billion. Both Cornell University research and trade publication estimates put the percentage contribution

of produce to total supermarket sales at about 10.5 percent in the mid- to late-1990s. This proportion would indicate supermarket fresh produce sales of approximately \$33.9 billion. In a separate approach, the trade publication, *Supermarket Business*, (September 1997) estimates supermarket produce sales similarly to be \$34.9 billion.

Sales from general-line grocery stores *other than supermarkets* include those from small mom-and-pop stores or corner grocery stores. Total store sales from

TABLE 3.6

1996 Grocery Sales by Volume and Format

	Number of Stores	Sales
Food Stores		-\$ billions-
All Grocery Stores	127,000	425.7
Supermarkets	29,900	323.2
Convenience Stores	55,100	26.8
Wholesale Club Stores	705	19.6
Other Stores	41,295	56.1

Source: *Progressive Grocer*, April Supplement, 1997

these outlets in 1996 were reported at \$102.5 billion (Table 3.6). Recognizing that small grocery shops generally carry far fewer fruits and vegetables than supermarkets, perhaps half as many, the fresh produce share of small grocery store sales is about 5 percent of their overall sales, or \$3.8 billion.

Other Retail Food Outlets

To arrive at total fresh produce sales in all retail outlets, produce sales in the remaining retail channels must be added: convenience stores, and delicatessens and other specialty food stores. In the latter case, a significant amount of fresh fruits and vegetables is sold through a considerable variety of specialty stores: green markets, fruit and vegetable grocers, as well as through meat and fish markets, retail bakeries, and dairy stores. For the most recent *Census of Retail Trade* conducted by the U.S. Department of Commerce in 1992, sales of produce from 2,971 fresh produce specialty stores were estimated at \$1.5 billion. Sales from the remaining food stores as well as delicatessens were minor amounting to \$100 million. Using a Consumer Price Index (CPI) of 1.40 for fresh fruits and vegetables to inflate to 1996 terms brings the estimate for fresh produce stores and other specialty food stores to \$2.1 billion.

Using the same procedure, convenience store produce sales, as reported by the 1992 Census, were inflated to an estimate of 1996 sales. In 1992, produce sales from convenience stores were \$200 million; after inflating to 1996 terms, sales were estimated to be \$300 million. This is probably a conservative estimate because a recent trend in convenience stores has been increased store space devoted to selling produce.

Specialty fresh fruit and vegetable markets appear to be a stable retail niche marketing channel in urban areas. Other urban, public markets, such as the Reading Terminal Market in Philadelphia and the Pike Place Market in Seattle, provide more limited opportunities for selling fresh produce. Various market forums, such as public markets and farmers' markets, may differ by some key factors, including the edicts or ordinances under which they operate, the types of vendors participating and the operating environment of the markets.

Historically, a number of urban markets operated in municipally owned buildings or sites that provided space or stalls for merchant vendors to sell fresh food. These markets used to offer shoppers many of their perishable products. Since then however, grocery stores evolved to become the primary source of most food products, and the role of these urban markets changed.

Large, urban markets housed in permanent structures still open in downtown or centrally located urban areas. They provide a sheltered, central site for specialized vendors to gather and sell to the public and usually are located in densely populated areas. They also usually operate year-round, four to seven days per week.

Produce sales through these markets, either by produce farmers or produce vendors who buy product to resell, are difficult to assess but likely are minimal. A poll of 16 large, urban markets in the United States indicates most of their vendors sell ready-to-eat foods, processed foods and crafts. The median farmer participation rate was 5.6 percent of total vendors; a median of 2.1 percent of total vendors were produce farmers (Table 3.7). Farmers with seasonal products and limited product varieties often are precluded from marketing directly through public markets because of the markets' year-round operations. Enclosed markets in urban areas generally don't easily move product in and out, and the requirement that farmers be at the markets daily takes them away from critical farm operations.

Few farmers stay in the urban markets according to these figures, and those farmers who participate in the markets usually are not at the markets year-round and participate only during their harvest season. Four of the 16 markets polled, however, scheduled either separate Farmers' Market days or had outdoor facilities for farmer vendors. These markets also had a higher than average farmer participation.

Public markets do provide a venue for vendors who purchase farm commodities to resell. These vendors may buy product from wholesalers for resale or may buy directly from local farmers to resell at the public markets.

Eighty-six percent of public markets are managed by either a non profit agency or a city or municipal department. Most of the non profit agencies are specifically chartered by the municipality to manage the public market facilities and merchants.

TABLE 3.7

Farmer Participation in Urban Markets

	Median	Average	Range
Number of total vendors	79.5	124.6	21-494
Percent farmer vendors	5.6%	31.1%	0.0-85.1%
Percent produce vendors	15.4%	29.1%	0.0-84.1%
Percent produce farmer vendors	2.1%	19.0%	0.0-84.1%

All Retail Store Produce Sales

Thus, estimates for fresh produce sales from retail food stores follow:

TABLE 3.8

Estimates of Fresh Produce Sales from Food Stores, Mid- to Late-1990s

	Sales
	-\$ billion-
Food Stores	40.1
Grocery Stores	
Supermarkets	33.9
Other General-Line Grocery Stores	3.8
Convenience Stores	0.3
Specialty Food Stores	2.1

Retail produce purchases were estimated using a 32.4 percent gross margin, the average gross margin for retailers (FreshTrack 1997). Purchases then were calculated subtracting 32.4 percent of sales from \$40.1 billion arriving at total produce purchases of \$27.1 billion.

Refer to Figure 3.1, note that total retail store sales of \$40.1 billion constitute approximately 53.5 percent of all fresh produce sales to consumers, while food service outlets make up 45.0 percent. The remaining 1.5 percent of produce sales are direct sales from farmer to consumer.

Food service

Many operations of the food service industry contribute to food-away-from-home consumer purchases. Food service comprises restaurants, food contractors, hotels and lodging places, schools, hospitals, military, and more. In 1996, sales from restaurants and fast food establishments contributed 71.0 percent, to food-away-from home purchases (USDA, 1999).

In 1996, U.S. consumers spent 44.8 percent of their all food funds, excluding alcoholic beverages, on food away-from-home (USDA, 1999). Consumers visited various establishments, such as full service restaurants, fast-food restaurants, and institutional and military food service establishments. Their interest in health and nutrition has increased per-capita consumption of fresh fruits and vegetables, and their desire for gourmet items and specialty foods has increased the availability of *non traditional* produce.

As consumers eat food prepared away from home more frequently, these establishments become larger customers for the produce industry. Indeed, the restaurant industry's preparations of novel and ethnic dishes spawned many consumer demands for specialty produce and gourmet dishes. In addition to increased consumption of specialty fruits and vegetables, problems with finding and retaining skilled employees in the industry have increased demand for more labor-saving preparation and packaging for the food service kitchen including prepackaged salads and precut vegetables.

The USDA Economic Research Service reported total food away-from-home spending in the mid- to late-1990s reached \$306.3 billion (USDA, 1999). In *FreshTrack 1997*, produce was reported at 11 percent of the total cost of food sold in the restaurant industry. Assuming the same ratio for sales, produce sales as part of the food service sales to consumers were calculated at 11 percent of total sales, or \$33.7 billion:

	Expenditures
Total food away-from-home	\$306.3 billion ¹
Produce portion of food service sales	11 percent ²
Value of food service produce sales	\$33.7 billion ³

¹ Includes eating and drinking places, hotels and motels, recreational places, schools and colleges, and all other. Source: USDA, U.S. Food Expenditures, 1997.

² McLaughlin, et al, *FreshTrack 1997*.

³ \$306.3 billion(.11) = \$33.7 billion.

While sales of fresh fruits and vegetables through food service establishments are quite similar to sales through retail outlets, the volume moving through the channels is much different. The total volume of produce moving through the food service industry is much lower than that of the retail industry. Cost of food sold is estimated at 30 percent of food service sales (*1997 Restaurant Industry Operations Report*, 1998) equal to a 70 percent "gross margin" in retail trade. With \$33.7 billion in produce sales from food service, its produce purchases in the mid- to late-1990s are estimated at \$10.1 billion.

Transportation

Most of the major markets, i.e., consumption areas, for fresh produce in the United States are distant from the major production areas. Because produce spoils quickly compared to dry grocery items, transportation is a vital link in produce distribution channels.

Long-distance transportation is primarily by truck, although rail is still used for some produce, such as potatoes and onions. Long-distance transportation can be estimated by calculating the cost of produce transportation pay retailers and food service distributors. Retail produce purchases were estimated at \$27.1 billion and food service purchases at \$10.1 billion. Several conversations with these produce receivers indicate that long-distance hauling is approximately

12 percent of purchases. Using these approximations, the long-distance hauling costs are estimated by:

End Receiver Purchases:

Retailers	\$27.1 billion
Food service	10.1 billion
<hr/>	
Total produce purchases by end receivers =	\$37.2 billion
	$\$37.2 \text{ billion} \times 12\% = \4.5 billion

This estimate follows closely How (1990), who estimated that domestic transportation added \$3.4 billion in value to the fresh produce industry in the late 1980s.

Direct Markets

Growers sell some fresh fruits and vegetables directly to consumers, bypassing the complex channels of contemporary distribution. Outlets used by growers to sell directly to the consumer include roadside stands and stores, farmers' markets, u-pick operations, public markets and mail order. These direct marketing channels support small and medium-sized growers by providing direct access to consumers and allowing growers to retain the full mark-up price between farm and consumer.

The National Directory of Farmers' Markets—compiled in 1998 by the USDA, Agricultural Marketing Service, Wholesale and Alternative Markets Program—lists 2,675 farmers' markets in the United States. These markets are listed primarily by the state departments of agriculture as being active and also include markets sponsored by local regional farmers' market organizations. A 1994 survey of these farmers' markets estimated that more than 20,000 farmers use farmers' markets to sell directly to consumers, of which 6,648 farmers use them as their sole marketing outlet (Burns, 1996). Adding the number of farmers

selling directly from farm stands also increases the direct sales outlets, although no information exists to provide a close estimate.

The growth in farmers' markets and interest in alternative farming methods, with growing support for maintaining "green spaces" and local economies, may provide some support to small to medium-sized growers, enabling them to continue to survive, despite certain countervailing forces driven by economies of scale.

Because direct sales to consumers are often for cash, total produce sales by U.S. farmers directly to consumers are difficult to estimate. Informal estimates, however, provide insights into the sales volumes achieved by direct marketing channels from seven states (Table 3.9). McLaughlin and Perosio (1994) estimated sales through direct marketing channels nationwide to be \$1.1 billion.

TABLE 3.9

Direct Marketing Sales Estimates from Seven States

State	Sales Estimates
	<i>-million-</i>
New York State	\$400
California	\$2001
Pennsylvania	\$195
New Jersey	\$189
North Carolina	\$14
Massachusetts	\$85
Iowa	\$5-\$5.5

¹ California Farmers' Markets only; does not include other direct marketing channels

² Four state-operated markets only; does not include other direct marketing channels

Source: USDA, *Farmers' Markets Survey Report*, 1996

Consumers

Consumers, the final link in the produce distribution chain, are the ultimate source of all demand at other levels. The U.S. Bureau of Labor Statistics collects data on consumer expenditures on all food products in its annual Consumer Expenditures Series. For 1996, this series reports that consumer spending on all fresh fruits and vegetables from major retail outlets was \$35.79 billion, an estimate closely corroborated by the sales numbers produced above from other government and industry data.

Fresh fruits and vegetables have become an increasingly important part of American consumers' diets. The typical supermarket fresh produce department carries more than 2½ times as many items today as in the mid- to late-1970s (McLaughlin and Perosio, 1994). Increases in domestic production, rising imports and improved storage facilities now afford year-round availability of many fresh foods.

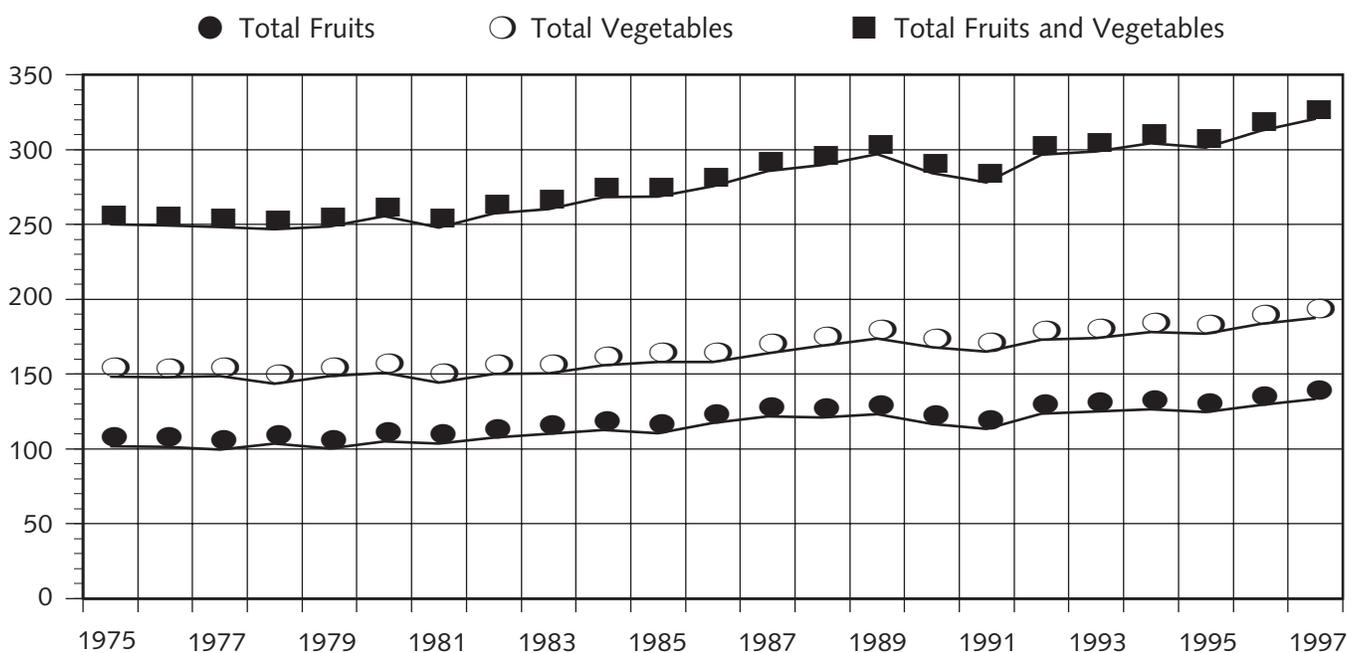
The Department of Agriculture tracks the per-capita consumption of 26 fruits and melons and 26 vegetables. U.S. per capita consumption of fresh fruits and vegetables in 1975-1977 was 101 and 148 pounds respectively. By 1995-1997, fresh fruit consumption had risen 27.6 percent to 129 pounds. Consumption of non citrus fruits increased 37 percent while citrus declined 9.4 percent. Fresh vegetable consumption increased 23.2 percent to 183 pounds.

Total per-capita use of commercially produced fresh fruits and vegetables rose by 25 percent, from an average of 249 pounds for the years 1975-1977 to 312 pounds in 1995-1997 (Table 3.10). Annual consumption for the period 1975-1997 can be seen in Figure 3.7.

The three most consumed fruits in the mid- to late-1990s were bananas (27.7 lbs.), apples (18.9 lbs.) and watermelons (16.4 lbs.). In 1975-1977, the top three consisted of bananas, apples and oranges. The top vegetables in the 1990's were potatoes (49.0 lbs.), head lettuce (23.4 lbs.) and tomatoes (18.0 lbs.), also were the top three in mid- to late-1970s.

FIGURE 3.7

Per-Capita Consumption of Fresh Fruits and Vegetables, 1975-1997



Source: USDA, Economic Research Service, *Fruit and Nut Yearbook*, Table F-29
 USDA, Economic Research Service, *Vegetable Yearbook*, Table 1

TABLE 3.10

Annual Per-Capita Consumption of Fresh Fruits and Vegetables:
1975-1977, 1985-1987 and 1995-1997 Averages

	1995-1997	1985-1987	1975-1977		1995-1997	1985-1987	1975-1977
Non citrus fruits^{1,2}		-lbs.-		Vegetables²		-lbs.-	
Apples	18.9	18.6	17.7	Artichokes	0.5	0.7	0.4
Apricots	0.1	0.1	0.1	Asparagus	0.6	0.6	0.4
Avocados	1.5	1.9	1.0	Broccoli	4.7	2.9	1.1
Bananas	27.7	24.8	18.7	Brussels sprouts	0.4	0.3	0.3
Cantaloupes	10.5	9.0	5.4	Cabbage	9.4	8.9	8.7
Cherries	0.4	0.5	0.7	Carrots	10.5	7.1	6.0
Cranberries	0.1	0.1	0.2	Cauliflower	1.5	2.0	1.0
Grapes	7.5	7.0	3.6	Celery	6.2	6.7	7.1
Honeydew melons	2.2	2.2	1.1	Corn	8.1	6.3	7.8
Kiwi fruit	0.5	0.2	0.0	Cucumbers	6.0	4.7	3.1
Mangos	1.3	0.5	0.2	Eggplant	0.4	0.5	0.4
Papayas	0.5	0.2	0.2	Escarole and endive	0.2	0.4	0.5
Peaches and nectarines	5.1	5.8	5.1	Garlic	2.1	1.0	0.6
Pears	3.3	3.1	2.6	Head lettuce	23.4	23.8	24.5
Pineapples	2.1	1.6	1.2	Leaf and romaine lettuce	5.9	2.7	NA
Plums and prunes	1.3	1.5	1.4	Mushrooms	4.0	3.6	2.2
Strawberries	4.2	3.0	1.8	Onions	17.8	13.6	10.9
Watermelons	16.4	13.1	12.2	Peppers	6.9	4.0	2.7
Total non citrus	103.6	93.2	73.1	Potatoes	49.0	47.7	50.7
				Radishes	0.3	0.5	0.6
Citrus fruits¹				Snap beans	1.5	1.3	1.4
Grapefruit	6.1	6.0	8.4	Spinach	0.6	0.6	0.3
Lemons	2.9	2.4	2.0	Sweet potatoes	4.6	4.7	5.2
Limes	1.2	0.5	0.2	Tomatoes	18.0	15.5	12.3
Oranges and temples	12.9	12.6	14.7				
Tangerines and tangelos	2.2	1.6	2.5	Total vegetables	182.6	160.0	148.2
Total citrus	25.3	23.2	27.9				
Total fruits	128.9	116.6	101.0	Total fruits and vegetables	311.6	276.6	249.2

¹ U.S.D.A., Economic Research Service, *Fruit and Nut Yearbook*, Table F-29

² U.S.D.A., Economic Research Service, *Vegetable Yearbook*, Table 1

TABLE 3.11

Total Produce Sales to Consumers

Source	Value of Produce Sales	Percent of Total Sales
	-\$ billion-	-%-
Retail Sales	40.1	53.5
Food service Sales	33.7	45.0
Direct Marketing Sales	1.1	1.5
Total Produce Sales	74.9	100.0

The total value of all produce sales to consumers in the mid- to late-1990s, as calculated here, sums to \$74.9 billion (Table 3.11). Retail sales of \$40.1 billion were 53.5 percent of total sales while food service sales amounted to \$33.7 billion or 45.0 percent.

Although the value of all produce sold through food service channels is 45.0 percent of the total, the volume of produce moved through food service establishments is much less and may be only approximately 27 percent of total volume (Table 3.12).

Because volume movement in total tonnage is not available, produce purchases by retailers compared to food service may approximate the volume movement proportions.

For example, food service produce purchases were valued at approximately \$10.1 billion (see Table 3.8). Retailer produce purchases were calculated using a 32.4 percent industry average gross margin (*FreshTrack 1997*) on the estimated total sales of \$40.1 billion. These purchases were valued at approximately \$27.1 billion, almost three times the value of food service produce purchases (Table 3.12).

Although direct marketed sales are quite minor, compared to the overall produce consumption of \$74.9 billion, one can attempt to account for the volume movement from sales marketed directly by the farmer or shipper. Total sales from direct marketing have been estimated at \$1.1 billion. No estimates are available to calculate the gross margin or the markup between farm production cost and direct marketing sales. The price of produce sold through farm mar-

kets, however generally is priced comparable to retail store produce prices. Yet the farmers' or shippers' produce "purchases" are much lower. Also consider, when estimating a gross margin, that direct marketers, generally add less value in packaging and grading to sell produce through direct marketing channels. A gross margin of 50 percent was used to calculate "produce purchases" as an estimate of volume moved through direct-marketing channels.

TABLE 3.12

Estimated Produce Movement Through Retail and Food Service to Consumers

Source	Produce Purchases	Estimated Percentage of Movement
	-\$ billion-	-%-
Retailer	27.1 ¹	71.7
Food service	10.1	26.7
Direct Marketing Sales	0.6 ²	1.6
Total	37.8	100.0

¹ calculated using 32.4% gross margin on sales of \$40.1 billion.

² calculated using 50.0% gross margin on sales of \$1.1 billion

Therefore, while the value of the fully prepared produce sold by the food service industry, \$33.7 billion, is approximately 45.0 percent of the value of all produce sold to consumers, the actual movement is significantly less.

Summary

Demand for fresh fruits and vegetables continues to grow as new varieties, pre cut and packaged convenience items, organics, and exotic imports appeal to the eyes and palates of consumers. Despite a 20-year sustained growth in demand and the ever expanding knowledge of production, storage and packaging technology, a lack of information about the basic product flows has characterized U.S. produce marketing channels.

This report has discussed the changing structure of the U.S. fresh produce distribution system and estimated the volumes and values of the product flowing through it in the mid- to late-1990s. This report should fulfill a need of produce system researchers and strategic planners as they attempt to track changes in this dynamic sector.

References

- “Annual Consumer Expenditure Study” (various years). *Supermarket Business*. September issues.
- The Blue Book* (1997). Produce Reporter Co., Blue Book Services, Carol Stream, IL.
- Boone, Louis E. and James C. Johnson (1977). *Marketing Channels*. Second edition. Petroleum Publishing Co., Tulsa, OK.
- Burns, Arthur F. (July 1996). *Farmers’ Markets Survey Report*. U.S. Department of Agriculture, Agricultural Marketing Service. Washington, DC.
- How, R. Brian (1991). *Marketing Fresh Fruits and Vegetables*. Van Nostrand Reinhold, New York, NY.
- Manchester, Alden C. (1964). *The Structure of Wholesale Produce Markets*. U.S. Department of Agriculture, Agricultural Economic Report No. 45.
- McLaughlin, Edward W., Kristen Park, and Debra J. Perosio (1997). *FreshTrack 1997: Marketing and Performance Benchmarks for the Fresh Produce Industry*. Produce Marketing Association, Newark, DE.
- McLaughlin, Edward W., Kristen Park, Debra J. Perosio, and Geoffrey M. Green (1998). *FreshTrack 1998: Marketing and Performance Benchmarks for the Fresh Produce Industry with a Focus on People*. Produce Marketing Association, Newark, DE.
- McLaughlin, Edward W., and Debra J. Perosio (1994). *Fresh Fruit and Vegetable Procurement Dynamics: The Role of the Supermarket Buyer*. R.B. 94-1, Department of Agricultural, Resource, and Managerial Economics. Cornell University, Ithaca, NY.
- 1997 Restaurant Industry Report* (1998). National Restaurant Association, Washington, DC.
- Progressive Grocer* (various years). April Supplement.

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