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# The U.S. Fresh Produce Industry: An Industry in Transition

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As the U.S. fresh fruit and vegetable marketing system enters the twenty-first century, there is increasing focus within the industry on adding value and decreasing costs by streamlining distribution and understanding customer needs. This dynamic system has evolved toward predominantly direct sales from shippers to final buyers, both foodservice and retail, with foodservice channels absorbing a growing share of total volume. Product form and packaging are changing as more firms introduce value-added products such as fresh-cut produce that are designed to respond to the growing demand for convenience in food preparation and consumption. Fresh produce continues to be a critical element in the competitive strategy of retailers, and its year-round availability is now a necessity for both foodservice and retail buyers.

## OVERVIEW OF KEY TRENDS AND PRODUCE INDUSTRY FUNDAMENTALS

### INTERNATIONAL TRADE

The challenge to supply seasonal, perishable products year-round has favored imports and increased horizontal and vertical integration among shippers regionally, nationally, and internationally. Generally speaking, no country produces all of the fresh fruits and vegetables it demands in every week of the year, creating the opportunity for trade. Other countries are responding to the U.S. market's growing demand for imports, aggressively developing their horticultural industries consistent with the implementation of broader export-led economic growth and diversification strategies. Simultaneously, the United States is investing in the long-term development of new export markets, in response to slowing consumer demand at home and the growth in year-round demand for produce in other countries. Indeed, the United States is the dominant player in the international trade of horticultural commodities, ranked number one as both importer and exporter, accounting for about 18% of the $44 billion in world horticultural trade.

Seasonality in the production and consumption of perishable commodities, combined with natural climatic production advantages, are the driving forces behind horticultural trade. Trade is often contraseasonal, such as the shipment of Southern Hemisphere grapes, stone fruits, and avocados from Chile to the United States and Europe in order to meet consumer demand during the Northern Hemisphere's winter, when domestic supplies are low. Similarly, the United States imports grapes from Mexico in the spring and exports them to Mexico in the fall. Differences in natural climatic and growing conditions between countries can provide competitive advantages that lead to trade in complementary products, such as U.S. apples and stone fruits shipped to Costa Rica and Costa Rican bananas and pineapples exported to the United States. Contraseasonal and complementary trade is generally rather uncontentious, as long as imports do not overlap to a significant extent with domestic shipping seasons. Most contentious is trade caused by differing levels of relative competitiveness between producers of the same or similar products during the same season. For example, trade disputes between the winter tomato industries in Florida and West Mexico have escalated as Mexican tomato exports increased due to the improved competitiveness of Mexican extended-shelf-life tomatoes relative to Florida mature green tomatoes.

As trade liberalization progresses, more disputes will arise; as greater market access is achieved through tariff reduction and the tariffication of nontariff trade barriers, more trade disputes will center around sanitary and phytosanitary (SPS) concerns. However, under World Trade Organization (WTO) and North American Free Trade Agreement (NAFTA) rules, SPS measures must be scientifically justified, and formal dispute settlement mechanisms exist to test their validity. Clearly, there is no turning back, and ongoing trade liberalization and improved transportation services, along with improved temperature management and modified atmosphere technology, will facilitate even greater world trade in fruits and vegetables well into the twenty-first century.

Nevertheless, world trading rules on SPS issues are evolving in response to challenges over issues such as the use of genetically modified organisms (GMOs) in food production. For example, a new biosafety protocol was adopted on January 29, 2000, in Montreal, Canada, by more than 130 countries. The provisions of the protocol include the establishment of a biosafety clearinghouse to help countries assess risks from bioengineered organisms, and a requirement for exporters to seek consent from importers before shipping living GMOs for intentional release into the environment (such as seeds for transplanting). The procedure does not apply to GMO commodities destined for consumption or contained use, or commodities in transit.

## DIFFERENTIATED PRODUCTS VERSUS COMMODITY ORIENTATIONS

Another key trend over the last decade was the attempt made by many suppliers to differentiate fresh produce. Despite these efforts, the difficulty of controlling the quality and volume of perishable items, both intra- and interseasonally, has limited the evolution of true consumer franchises for specific brands of consistently different products. Nature may change the appearance and eating quality of the same variety of the same produce item at any time in the production process. The riskiness of branding as well as selling private labels is further increased by the opportunity for improper temperature management throughout the distribution system. While firms may strive to perfect control over the ripening process and product quality throughout distribution, the reality is that if temperature abuse occurs, the image is tarnished of the firm whose name is on the product. For these reasons, the dynamics of fresh produce markets are still largely commodity-like, with relatively low levels of consumer advertising and most firms acting as price-takers.

The major exception to this is the fresh-cut produce sector, which includes value-added items such as bagged salads, washed baby carrots, and fresh-cut melons. Many fresh-cut products are regularly available in consistent quantities and qualities. Hence, fresh-cut produce is frequently marketed more like manufactured food products, often branded and backed by higher promotion budgets with shippers having a greater ability to influence price.

## RISK AND INDUSTRY DYNAMICS

The notoriously high level of risk observed in the fresh produce sector arises from the combination of product perishability and weather variability. Weather factors can always undo the best-laid plans by unexpectedly shifting short-run supply or demand. Perishability limits storability and the ability of firms to adjust to short-run disequilibria in supply and demand, other than through price.

Understanding this fundamental characteristic of the fresh produce industry helps explain the common grower-shipper practice of selling below total costs. Since shippers fiercely compete to retain buyer loyalty and buyers rank consistency of supply highly as a supplier attribute, shippers never want to risk shorting customers. Therefore, they tend to err on the side of excess plantings in order to be assured of meeting the firm-level demand for their products, even if weather, disease, or management factors should decrease their yields and production. In the aggregate, this creates a tendency for excess supply, as defined by market-clearing prices below grower-shipper F.O.B. break-even levels. Since most fresh fruits and vegetables can't be stored until supply declines relative to demand and prices improve, shippers facing long market conditions and are compelled to "sell it or smell it." This industry maxim captures the dynamics behind supplier behavior in the fresh produce sector, explaining why firms frequently sell at prices barely covering variable costs.

On the other hand, exogenous supply shocks caused by random weather events can significantly reduce total supply overnight. Given the relatively inelastic nature of the demand for fresh produce, equally rapid and dramatic increases in prices can occur. Weather conditions can also unexpectedly shift short-run demand. For example, when severe and extended storms in the Northeast keep people housebound and impede the ability of trucks to reach the largest market in the United States, demand and prices may decline significantly for winter produce shippers based in Florida, California, and Mexico.

The price volatility common to fresh produce markets has contributed to a heavy reliance on spot market (daily) sales, as opposed to forward contracting between shippers and buyers. However, this is changing as food markets become more consolidated, with fresh produce increasingly expected to fit within the paradigm of procurement practices for nonperishables in the food industry as a whole. A recent national study (Calvin and Cook et al. 2001) surveying shippers of five fruit and vegetable commodities found that daily sales had declined from 72% of the sample's total dollar volume in 1994 to 58% in 1999, replaced by advance pricing for advertising (lid prices) and contracts.

The high level of risk and price volatility at the produce shipper or supplier level does not encourage dominance by publicly traded companies concerned with quarterly profit reports to shareholders. Despite the entrance of multinational food processors into the production and shipping levels of the fresh produce industry during the 1980s, a sizable portion of fresh produce sales at the first-handler level still remains in the hands of relatively specialized, frequently family-controlled grower-shippers.

Furthermore, as the overall U.S. food market matures, competition for the consumer's food dollar is increasing, continually challenging fresh produce to compete with other more highly advertised food products. Fortunately, both the positive health messages associated with fruits and vegetables and their availability in more convenient forms have continued to stimulate per capita consumption of fresh produce. Still, fresh produce per capita consumption grew at an average annual rate of only 1% per year from 1989 to 1999 (U.S. Department of Agriculture, Economic Research Service [ERS] 2000a, 2000b). In mature (slow growth) markets there is less room for marginal players. At all levels of the vertical food system, the playing field has been "leveled upward" in terms of the quality and service demanded.

Additionally, the maturation of the food industry has led to the entrance of new competitors playing by new rules, encouraging mergers among existing firms as companies attempt to thwart the new competitive pressures. Chief among these new competitors are mass merchandisers introducing supply chain management, a procurement model designed to streamline the distribution system by eliminating non-value-adding transaction costs. Wal-Mart leads this trend with its penchant for contracting with suppliers and its growing use of the co-vendor-managed automatic inventory replenishment model. Investment of European supermarket chains in the U.S. market has likely reinforced this trend, as many European chains are further along in the implementation of supply chain management than conventional U.S. retailers. Today, 4 of the top 12 chains operating in the United States have European ownership, and the fourth largest chain is Ahold, a Dutch firm invested in the U.S. foodservice and online food shopping industries as well. Indeed, retailers have also been faced with the challenge of positioning themselves in a marketplace that offers nascent business to consumer food marketing choices (online food shopping) and emerging e-commerce procurement options, both of whose impacts and roles are as yet uncertain.

These new competitive pressures and others have contributed to retail, wholesale, and foodservice consolidation and an increase in upstream buying power. Greater buying power has caused an increase in the level and types of fees and services being requested from suppliers and is leading to more closely coordinated relationships between buyers and sellers. Shippers must adapt by adopting information technology and developing the systems and services capable of serving the needs of fewer, larger buyers. Shipper consolidation is a part of this process, whether through ownership or strategic alliances, although to date consolidation at the shipper level varies greatly by crop.

The current trend toward fewer, larger buyers and suppliers offers the industry the

opportunity to rethink standard operating practices and to adopt new coordination mechanisms designed to improve vertical coordination, including contracts with preferred suppliers, category management, and loyalty marketing, all components of efficient consumer response (ECR). A unified set of coordination mechanisms, ECR has been in use for some time in the dry grocery sector, with some of its elements now being applied to fresh produce. For example, category management has been used for an average of only 3 years in the produce department but is being rapidly adopted, with 65% of supermarkets reporting that they are implementing it, albeit to varying degrees (Progressive Grocer 2000). This chapter provides a snapshot of the evolving fresh produce industry at the outset of the new millennium, in transition to a more globalized, databased, technology- and information-intensive system.

## FRUIT AND VEGETABLE DEMAND

### GENERAL TRENDS

The immediate post–World War II era in the United States was characterized by accelerating population growth, rising affluence, and a relatively homogeneous population. Under these conditions, mass-marketing strategies for food became the norm, and emphasis was put on products that could be marketed nationwide and in large volumes. Much less variety was available than today in terms of the number, form, and quality of food products, and exporting was not a priority since there was a large and growing market right at home.

Since the 1970s, demographic and lifestyle trends have segmented the U.S. market, causing a marked increase in the diversity of consumers and the products they demand. Targeted marketing began to replace mass marketing in the 1980s and 90s, and even more finely tuned segmentation strategies can be expected in the future as information technology assists marketers. For example, the rapid expansion in the use of supermarket customer cards (which generate electronic records of individual consumer purchases) now enables retailers to micromarket in order to increase customer loyalty in the saturated, intensely competitive U.S. retail food market.

Fresh produce has participated much less in the movement toward targeted marketing given its reliance on product sales in bulk form (without UPC bar codes), making produce subject to a paucity of electronically available sales data by product and consumer type. However, this has recently changed with the advent of standardized product-look-up (PLU) codes for fresh produce. Supermarkets report that they have been using standardized PLU codes for an average of 5 years, with a 92% adoption rate (Progressive Grocer 2000). The use of standardized PLUs allows for instantaneous data collection at checkout and facilitates better information management, such as by benchmarking relative product and category performance both within and between stores, markets, and chains. At least three commercial providers now sell electronic produce retail sales data, permitting general access to formerly unavailable data. The availability of timely data should contribute to improved performance by highlighting poor sales results and documenting effective merchandising and pricing strategies. The combination of store-level data with consumer data generated from customer cards should contribute to more targeted produce marketing in the future, by both retailers and suppliers, although supplier access to customer data may be more limited. The potential for more strategic, consumer-specific fresh produce marketing is arguably largely untapped.

### CONSUMPTION

Two key lifestyle trends continue to affect food consumption: the ongoing entrance and advancement of women in the work force, increasing the demand for foods of high and predictable quality that offer convenience and variety; and the growth in public knowledge about how diet and health are linked and the importance of maintaining physical fitness throughout life. These trends have influenced the mix and form of foods consumed in the United States.

#### Per capita consumption trends

In part as a response to health concerns, per capita consumption of fruits and vegetables, in both fresh and processed form, increased 17% from 1976 to 1999, reaching 331 kg (730 lb) in 1999, as shown in table 2.1 (ERS 2000a, c). There was a general shift in product

form toward the fresh and "natural." Many marketers incorporated "lite" or "natural" on their labels, along with stronger health claims such as reduction of heart disease or prevention of cancer. These claims benefited fresh fruits and vegetables proportionally more than processed ones, with 56% of total fruit and vegetable consumption in processed form in 1999, compared to 60% in 1976.

Vegetable consumption, in both fresh and processed form, grew much more rapidly from 1976 to 1999 than did fruit consumption. Vegetable per capita consumption increased 24% to 202 kg (445 lb), an average annual rate of 0.9%. Per capita fruit consumption grew by only 8%, to 129 kg (284 lb), an average annual rate of 0.33%. Consumption of fresh fruits and vegetables grew more rapidly than that of processed fruits and vegetables. Fresh vegetable per capita consumption grew at an annual average rate of 1.3% over this period, compared to 0.6% for processed vegetables. Fresh fruit consumption increased at an average annual rate of 0.9%, compared to only 0.03% for processed fruits.

Still, processed fruit consumption far outweighs fresh, at 83 kg (183 lb) per capita in 1999, compared to 46 kg (101 lb) for fresh

**Table 2.1.** U.S. per capita fruit and vegetable consumption (kg), 1976–1999, and growth rates

| Item | 1976 | 1986 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | Growth 1989–1999 | Avg. growth per year 1989–1999 | Growth 1976–1999 | Avg. growth per year 1976–1999 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VEGETABLES | | | | | | | | | | | | | | | | | |
| Vegetables, excluding potatoes | | | | | | | | | | | | | | | | | |
| Fresh | 52.0 | 59.4 | 66.9 | 65.2 | 63.2 | 66.6 | 68.6 | 72.1 | 70.1 | 73.3 | 75.8 | 74.3 | 78.0 | 16.6% | 1.5% | 49.9% | 1.8% |
| Processed | 54.1 | 54.0 | 56.2 | 60.5 | 62.0 | 60.7 | 61.9 | 61.2 | 61.0 | 60.3 | 59.3 | 60.4 | 59.7 | 6.3% | 0.6% | 10.3% | 0.4% |
| Subtotal | 106.1 | 113.4 | 123.1 | 125.8 | 125.1 | 127.2 | 130.5 | 133.3 | 131.1 | 133.6 | 135.0 | 134.6 | 137.7 | 11.9% | 1.1% | 29.7% | 1.1% |
| Potatoes | | | | | | | | | | | | | | | | | |
| Fresh | 22.4 | 22.1 | 22.7 | 21.2 | 22.9 | 22.0 | 22.9 | 22.8 | 22.6 | 23.0 | 22.0 | 21.7 | 21.9 | –3.4% | –0.3% | –2.2% | –0.1% |
| Processed | 34.4 | 35.0 | 34.9 | 35.1 | 38.1 | 37.2 | 39.6 | 40.0 | 40.3 | 43.8 | 42.1 | 42.2 | 42.5 | 21.6% | 2.0% | 23.5% | 0.9% |
| Subtotal | 56.8 | 57.1 | 57.6 | 56.3 | 61.0 | 59.2 | 62.5 | 62.7 | 63.0 | 66.8 | 64.1 | 63.9 | 64.4 | 11.7% | 1.1% | 13.3% | 0.5% |
| All vegetables | | | | | | | | | | | | | | | | | |
| Total fresh | 74.4 | 81.5 | 89.6 | 86.5 | 86.0 | 88.6 | 91.5 | 94.9 | 92.8 | 96.3 | 97.8 | 95.9 | 99.9 | 11.5% | 1.1% | 34.2% | 1.3% |
| Total processed | 88.5 | 89.0 | 91.1 | 95.6 | 100.1 | 97.9 | 101.5 | 101.1 | 101.3 | 104.1 | 101.4 | 102.6 | 102.1 | 12.1% | 1.2% | 15.4% | 0.6% |
| Grand total | 162.9 | 170.5 | 180.7 | 182.1 | 186.2 | 186.5 | 193.0 | 196.0 | 194.1 | 200.4 | 199.2 | 198.5 | 202.0 | 11.8% | 1.1% | 24.0% | 0.9% |
| FRUITS | | | | | | | | | | | | | | | | | |
| Citrus | | | | | | | | | | | | | | | | | |
| Fresh | 12.9 | 11.0 | 10.7 | 9.7 | 8.6 | 11.0 | 11.8 | 11.3 | 10.9 | 11.3 | 12.2 | 12.3 | 9.4 | –12.0% | –1.3% | –27.3% | –1.4% |
| Processed | 46.4 | 43.2 | 40.0 | 39.5 | 39.0 | 33.7 | 40.8 | 39.8 | 42.8 | 42.6 | 43.1 | 44.7 | 39.5 | –1.2% | –0.1% | –15.0% | –0.7% |
| Subtotal | 59.4 | 54.2 | 50.7 | 49.2 | 47.7 | 44.8 | 52.5 | 51.2 | 53.8 | 54.0 | 55.4 | 57.0 | 48.9 | –3.5% | –0.4% | –17.6% | –0.8% |
| Noncitrus | | | | | | | | | | | | | | | | | |
| Fresh | 24.7 | 31.5 | 32.8 | 32.1 | 32.0 | 33.8 | 33.1 | 34.3 | 33.5 | 33.5 | 34.6 | 34.6 | 36.9 | 12.7% | 1.2% | 49.3% | 1.8% |
| Processed | 35.5 | 42.6 | 42.7 | 42.7 | 41.4 | 44.2 | 43.7 | 42.3 | 41.5 | 42.0 | 45.3 | 42.0 | 43.1 | 1.0% | 0.1% | 21.4% | 0.8% |
| Subtotal | 60.3 | 74.0 | 75.5 | 74.8 | 73.4 | 78.0 | 76.8 | 76.6 | 75.0 | 75.5 | 79.9 | 76.5 | 80.1 | 6.1% | 0.6% | 32.8% | 1.2% |
| All fruits | | | | | | | | | | | | | | | | | |
| Total fresh | 37.7 | 42.5 | 43.5 | 41.8 | 40.7 | 44.8 | 44.9 | 45.6 | 44.4 | 44.8 | 46.8 | 46.9 | 46.4 | 6.6% | 0.6% | 23.0% | 0.9% |
| Total processed | 82.0 | 85.8 | 82.6 | 82.2 | 80.4 | 77.9 | 84.4 | 82.1 | 84.4 | 84.6 | 88.4 | 86.7 | 82.6 | –0.1% | 0.0% | 0.8% | 0.0% |
| Grand total | 119.6 | 128.2 | 126.1 | 124.0 | 121.0 | 122.8 | 129.3 | 127.8 | 128.8 | 129.4 | 135.3 | 133.5 | 128.9 | 2.2% | 0.2% | 7.8% | 0.3% |
| FRUITS AND VEGETABLES | | | | | | | | | | | | | | | | | |
| Fresh fruits and vegetables | 112.1 | 124.0 | 133.1 | 128.2 | 126.7 | 133.4 | 136.4 | 140.5 | 137.2 | 141.1 | 144.6 | 142.8 | 146.3 | 9.9% | 1.0% | 30.5% | 1.2% |
| Processed fruits and vegetables | 170.5 | 174.7 | 173.7 | 177.8 | 180.5 | 175.8 | 185.9 | 183.2 | 185.7 | 188.7 | 189.8 | 189.3 | 184.7 | 6.3% | 0.6% | 8.4% | 0.4% |
| All fruits and vegetables | 282.6 | 298.7 | 306.8 | 306.1 | 307.2 | 309.2 | 322.3 | 323.8 | 322.9 | 329.8 | 334.5 | 332.1 | 331.0 | 7.9% | 0.8% | 17.1% | 0.7% |

*Source*: USDA ERS 2000a, 2000c. *Note*: Data may not sum to 100 due to rounding.

fruits. This is largely due to the importance of processed citrus consumption in the American diet, which totaled 39.5 kg (87 lb) in 1999. While processed citrus consumption is important, it declined by 15% over the period in question. Fresh citrus consumption declined even more, by 27% from 1976 to 1999, to 9 kg (20 lb) per capita in 1999. Growth in fresh fruit consumption came entirely from the noncitrus category, which grew by 49% to 37 kg (82 lb) in 1999.

Although per capita consumption of processed vegetables is still slightly larger than that of fresh vegetables, the gap has almost been eliminated, with processed vegetable consumption totaling 102 kg (225 lb) per capita in 1999, compared to 100 kg (220 lb) for fresh.

Total (as opposed to per capita) fresh produce consumption in the United States amounted to 40.2 billion kg (88.6 billion lb) in 1999, with fresh vegetable consumption outweighing that of fruit (ERS 2000a and 2000c). Fresh vegetable and melon consumption totaled 26.8 billion kg (59 billion lb), including 6 billion kg (13.2 billion lb) of fresh potato consumption. Consumption of fresh fruits was approximately half that of fresh vegetables, at 13.4 billion kg (29.5 billion lb), 3.9 billion kg (8.6 billion lb) of which was bananas.

Broccoli, carrots, peppers, onions, tomatoes, melons, bananas, grapes, strawberries, and kiwifruit led fresh produce consumption gains over the past 20 years. Several factors contributed to consumption growth for these commodities, including improved varieties and greater variety selection (grapes, tomatoes, melons, peppers); introduction of convenient fresh-cut forms (washed, peeled carrots); the development of year-round availability (broccoli, strawberries), in some cases through imports (grapes, melons); new uses through foodservice channels (tomatoes, broccoli, onions); and new consumer awareness of the nutritional benefits of the item (bananas, broccoli, carrots).

Lettuce is conspicuous in its absence from this list of key produce gainers. Despite the introduction of fresh-cut bagged salads, iceberg lettuce consumption declined over the last decade. Although romaine and specialty lettuce consumption grew dramatically by about 138%, the growth was from a very small base of 1.6 kg (3.5 lb) per capita in 1989 to 3.8 kg (8.4 lb) in 2000. Until recently, this growth merely cannibalized iceberg lettuce without contributing to expansion of the total lettuce category. However, in 2000 total lettuce consumption reached 15.1 kg (33.2 lb), finally surpassing the 1989 peak of 14.7 kg (32.3 lb) per capita. This indicates that adding value and convenience may indeed be enhancing demand.

The demand for specialty and ethnic fresh fruits and vegetables is growing, albeit from a very small base. While per capita consumption of specialty and ethnic fresh produce is likely underreported, for those specialty noncitrus fruits monitored by USDA, per capita consumption totaled 2 kg (4.4 lb) in 1999 compared to 0.86 kg (1.9 lb) in 1976 (ERS 2000a), and consumption of nontraditional fresh vegetables increased from 1.4 kg to 2.7 kg (3.1 to 5.9 lb) over the same period (ERS 2000c).

### Influence of demographics on fresh produce consumption

In 1998, the average household size was 2.6 people, with an average of $48,100 in income and $4,810 spent on food (The Food Institute 2000a). Fresh produce consumption has been favorably affected by numerous demographic trends, including declining household size, rising income levels, the consumption habits of baby boomers, and the growth in the numbers of Hispanic American and Asian American consumers.

Today, single-person households are one of the largest groups, representing 26% of the 102.5 million total households in 1998, next to married couples with children at 27% of total households. Husbands and wives without children account for 26% of households, while single parents are 6% of the total; other households (such as people living as roommates) account for 15% (The Food Institute 2000a). In 1998, the expenditure on fresh produce for single-person households was $164 per year, double that of per capita expenditures for households with five or more people and well above the per capita average of $118 for all households (The Food Institute 2000a). If household units continue to decline in size, fresh produce consumption should be further stimulated, given the generally greater discretionary income of smaller households to spend on high-value foods, as well as their

lesser ability to exploit economies of scale in purchasing.

While the share of national aggregate personal income received by each quintile of consumers was relatively stable between 1995 and 1998 (U.S. Bureau of the Census 1995–1998), the distribution of households by income level and food spending changed. The economic expansion of the 1990s increased the relative share of higher-income consumers in both the number of households and total food spending, while low-income households declined as a share of both. The following discussion highlights the current importance of higher-income consumers in food and produce spending.

In 1998, households earning over $50,000 per year represented 30% of U.S. households and accounted for an impressive 46% of total food spending, up from 25% and 35%, respectively, in 1995 (The Food Institute 2000a). In contrast, households earning under $15,000 represented 25% of the total number of households yet accounted for only 14% of food spending, down from 28 and 20%, respectively, in 1995.

Higher income levels have also stimulated fresh produce consumption. In 1998 the average household spent $294 to $305 per year on fresh produce in retail food outlets, roughly evenly divided between fruits and vegetables, out of total annual grocery store food expenditures of $2,780 (The Food Institute 2000a). Consumption of both fruits and vegetables is positively correlated with income. In 1998, households earning $70,000 and over spent an average of $475 on fresh produce compared to $194 for households earning under $15,000 per year. Middle-income consumers in the $30,000 to $39,999 income bracket spent close to the overall average of $315 on fresh produce. Incidentally, although fresh fruit and vegetable dollar expenditures are relatively similar, in physical volume, vegetable consumption is about double that of fruit, as noted earlier. Hence, fruits have a substantially higher average price per unit than vegetables.

Clearly, today there are more households with the ability to pay for high-quality food and value-added product forms, including items in the produce department. U.S. and Canadian consumers experience the lowest share of food expenditures relative to disposable personal income in the world, at 11 and 10%, respectively, in 1998 (ERS 1999). Despite the ability to pay for high-quality produce, were the economy to enter a recession, consumer expenditures on produce and willingness-to-pay for convenience should decline, just as they did in the recession of the early 1990s.

Households headed by consumers 55 years and older represent 32% of the total and account for the same percentage of fresh fruit and vegetable expenditures (The Food Institute 2000a). On the other hand, households headed by consumers 34 to 55 years old (the broadly defined "baby boomer" cohort) represent about 41% of the total while contributing nearly 48% of fresh produce spending. Conversely, households headed by people under age 35 amount to 26% of the total but proportionately contribute only 20% of fresh fruit and vegetable spending. The future of fresh produce consumption should remain strong if baby boomers continue to consume at above-average rates as they age. The lower consumption rates of younger consumers emphasize the importance of educating people about the benefits of fresh produce consumption, starting from youth. Such programs are currently underway by the 5-A-Day for Better Health Foundation, among others.

The changing ethnic makeup of the U.S. population is also favorable to fresh produce consumption, since Hispanic and Asian Americans consume fruits and vegetables at higher rates than African Americans and whites. In 1998, white households on average consumed $292 of fresh produce per year, compared to $408 for Hispanic Americans and $217 for African Americans (statistics are unavailable for Asian Americans). Over the last twenty years Hispanic and Asian Americans have consistently increased their share of the U.S. population, with 31 million Hispanics representing 11% of the 273 million U.S. residents in 2000, compared to 7% in 1980 (U.S. Bureau of the Census 1980, 1995–1998). In contrast, the share of African Americans was flat at 12% over the same period; Asians grew from 1 to 4% of the population (U.S. Bureau of the Census 1980).

The highest average household expenditures on fresh produce are now in the West, in part given to the higher concentration of Hispanic and Asian Americans there. The South still lags the nation in produce expenditures,

with the Northeast ranked second in importance, followed by the Midwest. The long-term movement of the population to the West and Southwest is likely to continue to benefit fresh produce consumption as regional migration exposes consumers to different eating patterns.

## KEY TRENDS IN MARKETING STRATEGIES

The moderate rate of growth in aggregate per capita consumption of fruits and vegetables is not surprising given the maturity of the U.S. food market. In high-income countries with slow rates of population growth (under 1% annually), total food consumption tends to be relatively stable since people are already well fed. Hence, food marketers compete for "share of stomach" (percentage of the total food consumed by a person), and although consumption of certain items may grow, it is generally at the expense of others. Because firms operating in highly competitive, saturated markets can't rely on population growth to expand sales quickly, they focus on three broad marketing strategies: new product introductions, market share growth, and development of new markets, including export markets and foodservice.

### NEW PRODUCT INTRODUCTIONS

The development of new food products occurred at a record rate after 1980 (when only about 1,000 new products were introduced), peaking in 1995 at 16,863 new products. Since the average supermarket carries around 20,000 products, competition for shelf space is increasingly keen. The negotiating power of food retailers has grown as the battle for their limited shelf space by food marketing firms has intensified, resulting in costly slotting fees (fees paid by suppliers to secure shelf space). To date, these fees have been confined mainly to the grocery section of the store; within the produce department they are only used for fresh-cut, branded products, where they may reach up to $2 million to acquire the business of a large multiregional chain (Calvin and Cook et al. 2001).

Since 1995, new product introductions declined to 9,664 products in 1999 (The Food Institute 2000c), highlighting the shift by many food marketing firms to more targeted strategies. As consumer segments and their food product needs are better understood, suppliers tend to introduce somewhat fewer but better targeted products. The high cost of new product launchings, in part due to slotting fees, coupled with a high new product failure rate, are compelling reasons for marketers to become more focused.

Fruits and vegetables were part of the growth trend in new product introductions, as well as part of the recent slowdown in this trend as firms became more market research–based in their new product offerings: 254 new products were introduced in this category in 1999 compared with 251 in 1997, and down from a 1996 peak of 552. While the proliferation of fresh-cut items, such as bagged salads, shredded broccoli, microwave-ready fresh vegetables, and washed baby carrots, fueled new product growth, many specialty items were also a factor.

In addition to conventional broccoli, today consumers may select from broccoli romanesco, purple broccoli, and broccoflower. Similarly, the watermelon category has been differentiated to include seedless, icebox, and yellow watermelons, and the tomato category has been expanded to over 15 offerings, including various colors of round, pear-shaped, and round cherry tomatoes, and heirloom tomatoes of various types. Many more tropical and subtropical fruits and vegetables are available today as well, including passion fruit, cherimoya, carambola, mamey, jicama, tomatillos, cactus leaves, and specialty squashes such as chayote. Many more nontropical ethnic varieties of produce are also commonly marketed now, including numerous types of Italian and Japanese eggplants and squashes, and many specialty leafy greens and cabbages including arugula, mizuna, several varieties of radicchio, mache, savoy cabbage, bok choy, and baby bok choy, and many Italian and Asian specialty mushrooms.

#### Product diversity

After more than a decade of a high level of both new product introductions and failures, the average number of items handled in a U.S. fresh produce department is up dramatically. Estimates of the average number of products handled in a U.S. fresh produce department vary from 345 in 1998 (Supermarket Business 1999) to 431 in 1999

(McLaughlin et al. 1999). This compares to 173 in 1987 (Litwak 1998) and 312 in 1994 (McLaughlin et al. 1999). The U.S. consumer probably now enjoys the greatest level of product diversity available anywhere in the world. Yet six commodity groups still make up 41% of total sales, the same as in the 1980s. However, the product mix and rankings of the top six have changed slightly from (in descending order) bananas, apples, citrus, potatoes, lettuce, and tomatoes, to bananas, lettuce, apples, tomatoes, potatoes, and grapes in 1999 (Progressive Grocer 2000).

Fresh-cut produce of all types has grown from virtually a zero base at the outset of the 1990s to account for an estimated 15% of the average retailer's sales in 1999 (McLaughlin et al. 1999). Specialty produce represented 2.6 to 3.7% of retail produce department sales in 1998, with independents selling at the high end of the range and chains at the low (Produce Marketing Association 2000). This likely highlights the strategy of independents who offer a more diverse product mix as a means for competing with chains.

The fact that the rapid pace of new product introductions has not stimulated even a remotely proportional increase in overall fresh produce consumption clearly indicates that fresh produce marketers are no different than other food marketers competing for a relatively fixed share of stomach.

Competition for retail shelf space is fierce, causing a "densing-up" phenomenon, with retailers introducing multideck cases to accommodate more products in the same linear space. The shelf space battle continues to prompt shippers and grower commodity groups, such as marketing commissions and orders (mandated-marketing programs), to commit more resources to in-store merchandising programs targeted to the needs of individual retailers. Marketers will increasingly seek to be "shelf captains," targeting those retail accounts and specific stores with the consumer demographics and pyschographics suited to their product. They will then attempt to influence shelf-space decisions and achieve a dominant position in that product category.

## MARKET SHARE GROWTH OR MERGER MANIA

Firms in the U.S. food marketing sector view a large market share, including, if possible, the position of market leader, as a key requisite to success. Since the 1980s, pursuit of market share has led to a dramatic consolidation in the U.S. food chain at all levels, from the farm through food retailing. Rather than competing to capture market share from rival firms, U.S. food marketers have often pursued share growth through mergers and acquisition of rivals. Beginning in 1997, merger and acquisition activity in the food sector rebounded strongly from a decade-long slump after intense activity throughout most of the 1980s. Mergers and acquisitions reached a historical high of 813 mergers in 1998, then retreated to 753 in 1999 (The Food Institute 2000b) with 630 estimated for 2000 (The Food Institute 2000e).

Despite the recent slowing in merger rates, the absolute level of mergers is still quite high, and these mergers have had important implications for the structure of competition in the U.S. food sector. In 1999, the four largest food retailers' share of grocery store sales was 27%, up from 18% in 1987; the 8 largest retailers' share was 38%, up from 27%; and the 20 largest retailers' share was 52%, up from 39% (Calvin and Cook et al. 2001).

## NEW MARKET DEVELOPMENT

Exports represent an important growth market for U.S. produce marketers. Although the importance of the export market varies widely by commodity, in general, exports were traditionally a small share of the market for perishable fruits and vegetables, owing in large part to trade barriers and the difficulty and expense of long-distance shipping. Trade liberalization negotiated under the recent Uruguay Round of the GATT and implemented under the new World Trade Organization, as well as through regional trade agreements such as NAFTA, has expanded market access and provided strengthened mechanisms for combating nontariff trade barriers such as scientifically unfounded phytosanitary restrictions. Advances in postharvest technology such as the development of container-level modified atmosphere technologies have also facilitated exporting to distant markets. Total U.S. horticultural exports, including fresh and processed fruits, vegetables, and nuts, were $10.5 billion in fiscal year 2000, up from $2.7 billion in 1985 (U.S. Department of Agriculture, Foreign

Agricultural Service [FAS] 2000). Processed horticultural crop exports far outweigh fresh, and within the fresh category, fresh fruit exports exceed those of fresh vegetables. Fresh fruit exports were $2 billion in 2000, compared to $1.3 billion worth of fresh vegetable exports.

More than 20% of the production of numerous fruits and vegetables is now exported, with the highest export propensity in the fresh table grape subsector, which on average has sent over 45% of total production abroad in recent years (FAS 2000). In export dollar value, the most important fresh fruit and vegetable exports are table grapes, apples, oranges, grapefruit, and lettuce. Fruits continue to play a greater role than do vegetables in our export trade. The top five U.S. horticultural export markets are Canada, Japan, Mexico, the United Kingdom, and the Netherlands.

The foodservice market is also becoming more important to fresh produce marketers, and more shippers are selling directly to foodservice distributors rather than through intermediaries (Calvin and Cook et al. 2001). In 1999 the consumer dollar was almost evenly divided between retail and foodservice expenditures, with the latter accounting for 48% of the total. However, the amount of value added to the product in foodservice channels is much greater than in retail since the food is prepared and served to consumers. Hence, foodservice's large share of total food expenditures substantially overrepresents the share of physical product volume sold through this channel.

For example, since consumers eat out on average 2.5 times per week and there are 1,095 potential meal occasions in a year, this implies that only 11% of total meals are eaten outside of the home. On the other hand, more and more consumers are purchasing meals to eat at home, and 1997 was the first year that restaurants sold more meals for takeout than for on-premises consumption. Although foodservice growth rates have been declining, down from 11% per year in 1978 to 5% in 1999, foodservice continues to grow at a more rapid rate than the retail food industry. In 2000, 76% of consumers ate out at least once per week, with 40% eating out two or three times per week (Food Marketing Institute 1999–2000). This highlights the importance of shippers further developing this important and growing market.

There continues to be potential for the addition of produce to menus and for the substitution of fresh fruits and vegetables for processed products. For example, when a large pizza chain substitutes fresh for processed mushrooms, the new volume may measurably increase fresh mushroom demand. In addition, the convenience store sector is still an untapped market, offering a potential new distribution channel for convenience-oriented fresh produce.

## FRUIT AND VEGETABLE INDUSTRY PROFILE

### PRODUCTION LEVEL

Total production of fresh-market vegetables, excluding potatoes, reached 20.4 billion kg (50 billion lb) in 1999 (ERS 2000b), up from 11 billion kg (24.3 billion lb) in 1976 (ERS 1977). Potato production was 18.5 billion kg (40.8 billion lb) in 1999 for fresh market and processing uses only, excluding seed, animal feed and other uses, about one-third of which was destined for the fresh market (U.S. Department of Agriculture, National Agricultural Statistics Service [NASS] 2000b). Production of fruit, for both processing and fresh markets, totaled 29.2 billion kg (65.9 billion lb) in 1999, compared to 24.4 billion kg (53.8 billion lb) in 1976 (ERS 1997, 2000a). In 1999, fruit was grown on approximately 1.3 million ha (3.2 million acres) (ERS 2000a) while vegetables, excluding potatoes, were produced on 1.4 million ha (3.5 million acres), 768,825 ha (1.89 million acres) of which were destined for the fresh market (ERS 2000b). Potato area harvested totaled 539,676 ha (1.33 million acres) in 1999, for both fresh and processed uses.

In 1999 the farm-level utilized value of production was $2.6 billion for citrus fruits, $8.3 billion for noncitrus fruits (ERS 2000a), and $15.2 billion for vegetables (ERS 2000c), making fruit and vegetable production destined for both the fresh market and processing a $26.1 billion industry. In 1999 the farm gate value of the twenty-five major fresh-market vegetables and melons, excluding potatoes, totaled $7.5 billion (ERS 2000b), and fresh-market potato production was estimated by ERS at $933 million. Fresh noncitrus fruit farm gate value was $5.6 billion,

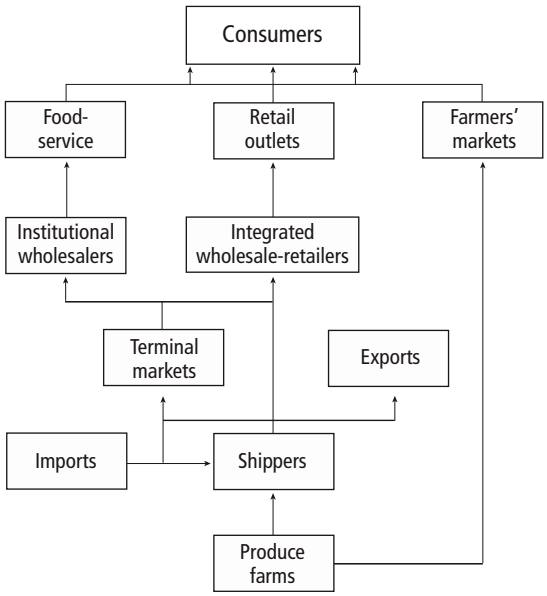
and fresh citrus production was valued at $1.2 billion (ERS estimate). Total fresh-market fruit and vegetable farm gate production was valued at $16.5 billion in 1999, including minor vegetables (ERS estimate).

## RETAIL AND FOODSERVICE LEVELS

Total 2000 fresh produce sales through all channels are estimated to be $75.8 billion. Sales of fresh produce in grocery stores are estimated to have reached $40.6 billion in 2000 (fig. 2.1). The estimated 2000 value of produce sold through foodservice channels was $34.1 billion, and an estimated additional $1.1 billion of fresh produce was sold directly from farmers to consumers via farmers' markets, "u-pick" operations, and roadside stands. The farmgate value of fresh produce was $16.6 billion in 2000, with exports valued at $3.2 billion and imports valued at $5 billion.

**Figure 2.1**

U.S. fresh fruit and vegetable value chain, 2000, estimated $75.8 billion.




The entire U.S. food system totaled $843.2 billion in final sales in 2000, including $449.5 billion of food sold through retail channels and $393.7 sold through foodservice channels (ERS estimate). Produce is estimated to represent 9% of the total. The producer share of the final value of fresh produce sold through all channels was 24.5% in 1999, compared to 20% for food products as a whole.

## LOCATION OF PRODUCTION

In 1999, California, the largest producer of horticultural commodities in the United States, contributed 54% each, respectively, to the nation's production of major fresh vegetables and fresh fruits, by value (NASS 2000c). California is the nation's exclusive supplier of clingstone peaches, dates, figs, kiwifruit, olives, pomegranates, prunes, and raisins. California's share of U.S. production exceeds 70% for each of the following fruits and vegetables: lettuce, processing tomatoes, broccoli, cauliflower, carrots, celery, strawberries, grapes, nectarines, plums, apricots, avocados, lemons, and honeydew melons. California's dominant position in the horticultural industry is explained by climatic, technological, and infrastructure advantages, as well as the market-and consumer-driven orientation of its agribusiness managers.

Florida, the second-largest producer of horticultural crops, produced 14% of U.S. fresh vegetables in 1999 (NASS 2000c) and 8% of national fresh fruit production, by value (ERS estimate). In the fresh fruit industry Florida's role is more important in citrus, where it contributed 22% of national value in 1999 (led by grapefruit), than in noncitrus, where it contributed 3% of the production value. While Florida accounts for only 18% of the total U.S. fruit industry in fresh and processed form (ERS estimate), it dominates in citrus. In 1999 Florida produced 76% of U.S. citrus, with oranges and grapefruit as Florida's leading citrus crops (NASS 2000a). Although Florida is the primary U.S. producer of oranges, with 9,512 metric tons (10,482 tons) of production in 1999/00, most of this went to processing, making California, at 2,280 metric tons (2,513 tons), the dominant producer for the fresh market (ERS 2000a). Florida leads in the production of several vegetables, including fresh-market tomatoes, snap beans, watermelons, and cucumbers, and accounts for more than half of the nation's production of fresh escarole, endive, and eggplant.

The remainder of U.S. fruit and vegetable production is dispersed among other states, primarily Arizona, Texas, Georgia, Washington, Wisconsin, Oregon, Minnesota, Michigan, New York, Idaho, and Hawaii.

### IMPORTS

Imports of fresh fruits and vegetables into the United States have expanded rapidly since 1980, when they totaled 3.7 billion kg (8.2 billion lb) and accounted for a 15.4% share of total consumption. In 1996 imports were 7.6 billion kg (16.8 billion lb), amounting to an import market share of 21% of the total 37 billion kg (81.5 billion lb) of fresh fruits and vegetables consumed in the United States (Lucier, Pollack, and Perez, 1997). Imports have continued to grow in absolute volume, but their share of consumption has increased only slightly. In 1999 fresh fruit and vegetable imports totaled 8.9 billion kg (19.6 billion lb), representing 22% of the 40.2 billion kg (88.6 billion lb) of U.S. fresh produce consumption (ERS estimate). Bananas, a crop that essentially does not compete with domestic production, represented a sizable 43% of imports at 3.9 billion kg (8.6 billion lb), and a 41.5% share of fresh fruit consumption. When bananas are excluded, fresh produce imports represented a much smaller 14% market share of U.S. produce consumption. Hence, despite the rapid growth in imports, the vast majority of fresh produce consumed in the United States is still domestically produced.

The principal foreign suppliers are Mexico, South America, Canada, and the Caribbean Basin Initiative (CBI) countries, but suppliers vary significantly between the vegetable and fruit categories. For example, while Mexico dominates U.S. fresh vegetable imports, totaling $2.1 billion in 1998, it is not a principal supplier of fresh fruit (FAS 1999). In 1998, Mexico accounted for 68% of fresh vegetable import value, including melons and potatoes, compared to only 23% of the $2.7 billion in fresh fruit imports. Mangoes lead Mexico's contribution to fresh fruit imports. For bananas, the principal suppliers are Ecuador, Costa Rica, and Guatemala, accounting for 30, 30, and 15% respectively of the $1.1 billion in total banana imports. Chile supplied 16% of fresh fruit imports in 1998 and is the leading foreign supplier of table grapes, deciduous fruit, and kiwifruit. Chilean produce ships during the off-season, when U.S. supply of these crops is low to nonexistent.

## SUPERMARKET PRODUCE DEPARTMENT PROFILE

Since 1990, the quality of fresh produce has been one of the principal factors influencing where consumers shop for food, with 88% of consumers ranking it as important in 2000, making it the number-two factor in importance after a clean, neat store (Food Marketing Institute 1990–2000). Many retailers have repositioned their store formats and image around the produce department, and produce is a critical element in their competitive strategy. In 1999, 91% of supermarkets placed the produce department prominently in the front of the store (Progressive Grocer 2000). Fresh produce sales now eclipse meat sales, traditionally the most important department in the supermarket. High awareness of the health benefits of produce and improved produce quality and merchandising should continue to reinforce the produce department's role in attracting customers to the store.

### PROFITABILITY AND SIZE

Data on the share of total store sales of the average produce department vary, in 1999 reaching an estimated 12.8% of total store sales, occupying 12.9% of store space and generating 20.9% of store profits according to *Fresh Track 1999* (McLaughlin et al. 1999). The 1997 U.S. Census of Retail Trade reported that supermarket and supercenter produce departments on average contributed 9.5% of store sales and 17.2% of store profits, and accounted for 12.7% of total store space (Kaufman et al. 2000). The proportionately greater contribution to profits than to sales and space is due to both the high turnover and high average gross margin (33.2%) of the produce department compared to the storewide average margin of 26% (Kaufman et al. 2000). Indeed, some estimates of produce department gross margins are as high as 44.1% (Supermarket Business 1999).

According to *Produce Merchandising*, average weekly fresh produce sales were $27,780 in the third quarter of 2000. The average size of a produce department was 327 $m^2$ (3,516 $ft^2$) in 1999, up from 237 $m^2$ (2,548 $ft^2$) and 10.3% of total store space in 1994 (McLaughlin et al. 1999).

## CHANGING STORE FORMATS

The produce department's larger average share of total store space represents an expanded share of increasingly larger stores. The superstore format now represents about 26% of all food retailer sales, compared to 12% in 1980, with an average size of 4,608 $m^2$ (51,200 $ft^2$). Conventional supermarkets (2,322 $m^2$ [25,800 $ft^2$] on average) have dramatically lost share, down from 55% of all food retailer sales in 1980 to 19% in 2000 (The Food Institute 2001). The superstore share of retail food sales is projected to remain stable, compared to a 14% share for conventional supermarkets by 2005. The larger size of superstores permits greater product offerings, including specialty food and service departments such as delicatessens, seafood departments, and bakeries, as well as nonfood departments. Other types of store formats have also gained share, including combination food and drug stores and super warehouses. Food-drug combinations are projected to account for 15% of food retail sales in 2005, up from 2% in 1980 (The Food Institute 2001). Given the greater product offerings in most store formats today, fresh produce's growing share of total store sales is especially impressive.

A nontraditional type of retail outlet also evolved rapidly during the 1990s. Supercenters (not to be confused with superstores) are a type of mass-merchandise outlet, combining a full-line supermarket with a full-line discount department store. Supercenters range up to 18,000 $m^2$ (194,000 $ft^2$) in size. The maturation of the U.S. discount market has induced mass merchandisers, such as Wal-Mart, K-Mart, and Target, to diversify into food marketing via the supercenter format, emerging as a major new force in food retailing. Wal-Mart has also recently entered the conventional food retailing industry with a 3,600-$m^2$ (38,700-$ft^2$) Neighborhood Market format.

The supercenter format is led by Wal-Mart, with estimated 1999 grocery-equivalent supercenter sales of $15.7 billion and total supercenter sales of $39.1 billion, 56% of the total national supercenter industry sales of $69.8 billion (The Food Institute 1999c). Wal-Mart's development of the supercenter concept has propelled it into the number five ranking among U.S. food retailers in 1999, compared to $45.3 billion for Kroger, the nation's number-one retailer. Its rapid rate of new store openings and the large size of the outlets means that Wal-Mart and other mass merchandisers are having a far bigger competitive effect on the food retailing industry than store numbers would imply. It is estimated that in 2000, 9.3% of national food store sales were generated by the grocery-equivalent sales of only 1,300 supercenters, compared to 31,500 supermarkets. This share may reach 16% by 2000 given the higher growth rate of the segment relative to the mature conventional retailing industry. Total U.S. supercenter sales are forecast to reach $112 billion in 2002, including $57 billion of food sales (The Food Institute 1999a). Despite the large nonfood sales of supercenters, fresh produce still represents 10% of the grocery-equivalent sales, just under the average level for supermarkets, again highlighting the importance of this new format to the produce industry (The Food Institute 1999c).

Another type of mass merchandiser is the membership club store that small businesses, individuals, or groups pay a fee to join. The club store focus is on high-volume sales of large-sized packs at relatively low margins in a warehouse format with minimal customer service. National club store sales, which were recently eclipsed by supercenter sales, totaled $60.7 billion in 1999, divided between Costco (49.3% of market share), Sam's Club (also owned by Wal-Mart, with a 43% market share), and BJ's, with a 6.7% market share (The Food Institute 1999b).

While only 4.3% of club store sales are fresh produce (The Food Institute 1999a), this is still equivalent to an impressive $2.6 billion worth of produce sales in 1999. Selling to membership clubs often requires providing special packs, which can imply additional risk for shippers given the difficulty in shifting these packs to other channels if sales don't materialize. Club stores generally don't have distribution centers, preferring just-in-time inventory systems. Hence, if store movement is slower than expected shippers generally absorb the slack as club stores are unable to hold excess inventory.

The focus of all mass merchandisers on streamlining the supply chain and eliminating non-value-adding costs will continue to exert competitive pressure on conventional

retailers over the next decade, with supercenter growth outpacing that of club stores.

## MARKETING CHANNELS AND PROCUREMENT PRACTICES

The principal marketing channels in the U.S. fresh fruit and vegetable marketing system are shown in figure 2.1. The three primary sales outlets to consumers are retail food stores; foodservice establishments, hotels, restaurants, and institutions (schools, the military, hospitals, nursing homes, shelters, and prisons); and direct farmer-to-consumer sales via "u-pick" operations, farmers' markets, and roadside stands. Although the majority of produce still moves through retail channels, foodservice may now account for 45% of total volume, and direct sales may account for 1.5%.

Produce sold in retail or foodservice outlets may be procured directly from shippers or via intermediaries such as wholesalers operating in terminal (wholesale) markets or in independent warehouses in local communities. According to the PMA *Fresh Track 1999* national survey of retailers, 43% of produce procured by the retailer respondents came directly from grower-shippers located in the production area (McLaughlin et al. 1999). Since the 1950s, terminal markets have steadily declined in importance; today there are only 22 major terminal markets, and the volume of produce sales they handle is an estimated 30% of the national total. Product formerly moving through terminal markets now goes directly from shippers to final buyers or via nonterminal market wholesalers, leaving these markets to handle the residual fresh-market production that cannot be marketed directly to retail or foodservice buyers. Terminal markets do play a dominant role in handling imported produce, especially markets located at or near ports.

Exceptions to the dominant marketing channel (directly from the production region to the final buyer) do exist, most notably for fresh-market tomatoes. The tomato ripening process and the long distances from production source to market make it difficult to achieve uniform color upon arrival. Consequently, repackers or wholesalers, both on and off terminal markets, handle a sizable portion of tomato shipments. These handlers repack to meet the color, size, and pack style requirements of specific retail and foodservice buyers.

The decline in terminal market share is largely a result of the increased buying power of integrated wholesale-retail buying entities. Integrated wholesale-retailers are self-distributing, operating large-volume centralized buying operations, making it more efficient for them to buy directly from the source, thereby avoiding intermediary margins and handling costs. Also, buyers are able to communicate directly with suppliers concerning important issues such as desired product quality characteristics and timing of production and delivery, without the information being diffused and possibly distorted by middlemen. For fresh products, production-source-to-buyer shipments have the additional advantage of not breaking the cold chain, better preserving product quality. Therefore, integrated wholesale-retail buyers use terminal markets primarily to balance short orders and to procure small-volume exotic or specialty items.

### INTEGRATED WHOLESALE-RETAILERS

Integrated wholesale-retailers include the centralized buying operations of corporate chains (11 or more stores) and affiliated groups comprised of voluntary chains and retail cooperatives. Voluntary chains consist of sponsoring wholesalers who supply independent retailers (retailers operating fewer than 11 stores) or small chains, as well as their own stores. Retail cooperatives are essentially member-owned wholesalers, since they consist of groups of retailers who vertically integrate, jointly owning a central buying and warehousing facility. These vertical coordination strategies give affiliated groups the benefits of joint buying, advertising, and merchandising programs, enabling them to compete with corporate chains despite the smaller size of individual members. Well-known examples of affiliated groups are SUPERVALU, Certified Grocers of California, and Independent Grocers Association (I.G.A.) in the United States; Spar, operating throughout Europe; and Lecler in France. Independent affiliated retailers are common in rural areas underserved by corporate chains.

Chains have steadily grown in importance since their origins in the early 1900s, when unaffiliated independent wholesalers and retailers were the norm. In 1999, chains

accounted for 80% of supermarket sales compared to 74% in 1994, 62% in 1974, and 58% in 1954 (Progressive Grocer Annual Report 1954, 1974, 1994). In each of these years the remainder was accounted for by sales through mainly affiliated independents, with unaffiliated groups currently representing fewer than 3% of all U.S. grocery sales.

Retailers in affiliated groups and corporate chains may differ in their procurement practices. Because a corporate chain owns all of its stores, it controls the products it handles and essentially exercises forced distribution. With standardized store formats, chains have more consistent quality needs than do affiliated groups who serve a wide diversity of independent retail members. Chains also typically have less ordering flexibility than affiliated groups, who can make more rapid store-level adjustments to accommodate sudden shipping-point changes in product availability and quality (McLaughlin 1983).

As the U.S. market has matured, mergers and acquisitions in the food industry have increased. As the industry has undergone consolidation and larger operators have acquired smaller firms, the number of integrated wholesale-retailer centralized buying operations has declined and sales per firm have increased. It is estimated that fewer than 250 centralized buying operations supply 127,000 food stores, including 20,300 chain supermarkets, 11,200 independent supermarkets (supermarkets are grocery stores with over $2 million in annual sales), 37,200 other grocery stores (food stores with less than $2 million in annual sales), 57,500 convenience stores, and 800 membership wholesale club stores (Progressive Grocer Annual Report 2000). As noted, estimates do vary, and *The Food Institute Report* (The Food Institute 1999d) indicates that there were 914 membership warehouse clubs in 1999. Some of the smaller grocery stores include greengrocers; the 1997 *Census of Retail Trade* identified 3,179 stores (compared to 2,971 stores in 1992) that specialized completely in fruits and vegetables, with $2.1 billion in sales. Supermarkets account for the bulk of food store sales, estimated by ERS at 70% in 1999.

The United States traditionally has not had any truly national supermarket chains; chains have tended to be regional in focus probably due to the nation's large geographic size. While this continues to be the case, it is rapidly changing, with a few chains now approaching national scope. Five chains have over 1,000 stores each, and Kroger, the market leader, surpasses 2,300 stores. The numerous recent retail mergers and the emergence of the supercenter concept are increasingly concentrating buying power in the hands of a few very large players, influencing the way firms deal with produce shippers.

Retailers often cite the potential for lowering procurement, marketing, and distribution costs as motivations for mergers and acquisitions. By purchasing more volume directly from larger shippers, retailers hope to gain greater efficiency in procurement by eliminating intermediaries and lowering the per-unit cost of goods. Large retailers also desire large volumes of consistent product to provide uniformity across all their stores, which may be more easily supplied by larger shippers. In return for consistent supply, retailers may offer shippers preferential procurement agreements such as partnering, contracts, or other strategic alliances that can be mutually beneficial. Large retailers can also achieve marketing efficiencies such as lower costs for advertising.

Although the economic effects of the recent mergers on fresh produce have not yet been determined, many suppliers fear that competition will erode. To date, many recently merged chains are still in the process of integrating their buying systems, and some still buy produce on a division basis (with divisions defined along the lines of the incorporated chains), lessening the effect of consolidation. However, this is changing, with corporate buying growing in importance at most chains and field buying declining somewhat (Calvin and Cook et al. 2001). Grower-shippers can expect consolidated food retailers to gradually reduce the number of buying offices and combine orders into larger volumes. If e-commerce platforms take hold, the procurement practices of integrated wholesale-retailers may become even more centralized.

Supply chain management practices such as continuous or automatic inventory replenishment are becoming more common. Under this system, shippers have access to retail sales data and are responsible for providing the correct amount of produce to each distribution center served on a just-in-time basis, potentially reducing the size and cost of

retail distribution centers. This system also allows retailers to streamline and downsize their produce buying offices. However, to date, mainly mass merchandisers rather than conventional grocery retail chains have implemented automatic inventory replenishment systems in fresh produce.

Clearly, the magnitude of produce that must be procured by large retailers today points to the need for closer coordination with preferred suppliers. There are now ten integrated wholesale-retailers, each with over 1,000 stores and selling a total of over $1 billion in fresh produce annually. For each of the two largest supermarket chains, fresh produce sales are estimated to exceed $4 billion. This makes consistent, predictable supply imperative, highlighting the need for retailers to work with suppliers as partners rather than adversaries. Shippers who are not equipped to sell to these very large buyers must focus their efforts on the remaining more fragmented portion of the food system, both retail and other outlets.

## WHOLESALERS AND BROKERS

While it is difficult to determine the total number of produce wholesalers, brokers, and distributors, the number may reach 6,000 (McLaughlin et al. 1997). Brokers are noteworthy players in fresh produce distribution, and their role has grown in importance since World War II. Brokers help negotiate sales on behalf of buyers or sellers for a percentage sales commission or a flat fee per unit. They do not physically handle or take title of the merchandise; thus, their fees are substantially lower than those charged by commission merchants. The use of brokers varies greatly by type of buyer and commodity, but buyers or sellers at any level of the distribution system may use brokers. As buyers procure broader product lines of both domestic and imported produce, many brokers have become global in their sourcing abilities and are increasingly oriented to meet specialized buyer needs. In 1999 it was estimated that brokers were involved in the trading of $8.9 billion worth of produce. However, the more consolidated marketing system poses new challenges to brokers, as larger buyers and sellers deal directly with each other and e-commerce procurement options evolve.

Today, terminal market and other wholesalers focus on independent retailers and foodservice accounts. Primary market handlers (receivers, merchant wholesalers, and commission merchants) procure more than half of their product from the shipping point. Receivers and merchant wholesalers buy and resell products, and commission merchants operate on a consignment basis. Secondary market handlers (jobbers and purveyors) procure more than half of their product from other wholesalers, principally primary handlers. They serve small-volume accounts such as greengrocers and restaurants, which require frequent deliveries of small lots. Purveyors focus almost exclusively on foodservice accounts.

While terminal markets in the Midwest and East are primarily destination markets, those located near the production regions on the West Coast and in Florida ship significant volumes to terminal markets and other wholesalers in the destination markets. Wholesalers in all regions have expanded customer services to include such functions as ripening, sizing, repacking, consumer packaging, and suggested advertising for retail accounts.

While food retailers have been consolidating, so have other produce buyers, such as broad-line wholesalers who sell to retail buyers. Grocery-oriented wholesalers undertook 32 mergers and acquisitions in 1999 and have undertaken a cumulative total of 105 since 1997. Foodservice wholesalers completed 31 mergers and acquisitions in 1999. Still, foodservice wholesalers remain relatively fragmented. In 1998, the 4 largest foodservice wholesalers accounted for 21% of the $147 billion in total foodservice wholesale industry sales, followed by the top 8 and top 20 firms with shares of 25 and 27% respectively (Calvin and Cook et al. 2001). Ongoing consolidation in the general-line, produce (specialized), and foodservice wholesaling industries will continue to contribute to a more consolidated marketplace, even though consolidation at the wholesale level still lags behind retail.

## GROWERS, SHIPPERS, AND NEW ENTRANTS

The number of U.S. farms of all types has been steadily declining for many years, including fruit and vegetable farms. In 1997 there were a total of 53,641 farms producing

vegetables for both the fresh and processed markets, compared to 61,924 in 1992; 85,973 farms were producing fruits, berries, and nuts in 1997, down from 89,417 in 1992 (U.S. Bureau of the Census 1992a, 1997a). Despite the decline, farm production of most commodities remains atomized in the sense that producer volumes, although often large in absolute terms, are small relative to the size of the market. However, increasingly, there are larger farmers concentrated in key production areas such as California and Florida that account for a growing share of the total farm value of fruits and vegetables. For example, according to the 1997 *Census of Agriculture* roughly 2,500 vegetable growers in California accounted for almost half of the total value of vegetable production captured in the census. Just over 14,000 California growers contributed 60% of the national value of fruit, berry, and nut production in 1997.

Furthermore, in key production regions such as California and Florida, a few large growers are forward-integrated into the marketing of their own production and the production of other growers—hence their designation as "grower-shippers." These grower-shippers control production, packing, and cooling facilities, and also arrange for both domestic and export sale, transportation, and promotion. Sales at the shipper level are quite concentrated relative to the grower level, but the shipper structure for many crops is still quite fragmented relative to structure at the buying end of the marketing system (although this varies substantially by crop). For example, in 1999 there were approximately 149 California table grape shippers, with none estimated to account for over 6% of total industry sales. In contrast, there were only 25 California tomato shippers, with the top 4 shippers handling 43% of industry sales (Calvin and Cook et al. 2001).

In general, consolidation at the buying end of the food marketing system is driving consolidation at the shipping level as suppliers structure their operations to attain operating scales consistent with the needs of the fewer, larger buyers. Retailers and foodservice users continue to demand more services, including year-round availability of a wide line of consistent quality fruits and vegetables, ripening and other special handling and packaging, assistance in category management, product stickering with PLU codes, and information on product attributes, recipes, and merchandising.

Many grower-shippers have become multiregional, and some have become multicommodity in order to maintain a year-round presence in the marketplace. This enables them to extend shipping seasons and sell products produced in several locations via one centralized marketing organization. For example, lettuce–leafy green and cole crop shippers headquartered in Salinas, California also commonly ship out of the San Joaquin Valley, Imperial Valley, and southwestern Arizona. Also, to achieve year-round volume, key Florida tomato shippers produce in several Florida locations during the winter and produce in the East Coast and California during the summer and fall.

As year-round shipping has become common for many produce firms, so has international off-season sourcing, in particular for California shippers. Shippers usually obtain offshore produce either through joint ventures with foreign producers, as exclusive or preferential importer-marketers, or on a contract basis. Many California grape, stone fruit, and kiwifruit shippers maintain a consistent market presence with buyers by acting as importer-marketers for contraseasonal production of the same produce from Chile. Research done by Alston et al. (1996) indicates that year-round sourcing actually increased demand for California table grapes, most likely because the year-round availability reinforces consumer buying habits.

The rapid growth in multilocation firms has also contributed to the integration of the Mexico-California-Arizona vegetable industries (Cook 1990). Because most vegetable crops are not perennials, the location of production can shift readily, based on the relative costs of production and marketing and the growing season. Despite this flexibility to source elsewhere and the greater market access resulting from NAFTA, most California-Arizona firms still produce the bulk of their fresh vegetables domestically. This is due to infrastructure, technology, and efficiency advantages relative to producing in Mexico. Seasonal climatic considerations generally remain the primary reason for sourcing in Mexico, rather than cost competitiveness; early-season table grapes, asparagus, radishes, and green onions are exceptions.

New entrants to the produce industry have challenged independent shippers and grower cooperatives. Multinational food processors entered the fresh produce market during the 1980s as consumption of canned produce declined. These firms began applying their branded marketing strategies to produce, contracting with producers here and in foreign nations to ensure a year-round market presence for their brands. Several acquired produce wholesalers and shippers to broaden their base of commodities and distribution channels. Three notable multinational players stand out in the produce industry: Dole, Del Monte, and Chiquita. Still, many multinationals have failed in the risky fresh produce arena, so far precluding a transformation of the fresh sector of the fruit and vegetable industry to the dominant multinational structure now observed in the processed sector.

## FOODSERVICE

The growth in fresh produce items handled on foodservice menus has affected distribution channels. In the 1980s, many fast-food outlets added salad bars, and in the 1990s they added fresh-cut salads as well as other menu items that include produce. In 1987, McDonald's already reportedly used 2% of the total U.S. lettuce crop and 1% of the fresh tomato crop. Simultaneously, upscale "white tablecloth" restaurants were expanding the demand for premium quality and exotic produce.

Prior to the 1980s, broadline institutional wholesalers (foodservice distributors) supplying the foodservice industry with dry and packaged groceries did not handle produce; foodservice users procured their produce largely through wholesalers specializing in produce. The rising volume of produce handled by foodservice establishments presented an opportunity for broadline institutional wholesalers, and virtually all the leading distributors formed entire divisions to procure and merchandise produce. Sysco is North America's largest foodservice distributor, with fiscal year 2000 sales of $19.3 billion, 104 distribution centers, servicing over 356,000 commercial and noncommercial foodservice establishments. Promotional programs to further stimulate fresh produce sales through this type of entity obviously hold great potential.

These changes in produce buying have enabled a growing portion of foodservice produce to be procured directly from the shipping point. Some foodservice distributors invested in shipping-point firms or formed joint buying groups in production regions (e.g., Markon and Pro-Act). This has increased their negotiating power and enabled them to exert better control over product quality, packaging, and consistency of supply, no longer allowing retailers to freely dictate standards in the produce trade.

Many shippers have introduced special foodservice packs (smaller than retail packs). The development of the fresh-cut sector during the 1980s was aimed almost entirely at the foodservice market, where convenience of preparation was already recognized as an asset. Products such as cored or chopped lettuce, peeled garlic, and broccoli florets were designed to cut waste and labor at the operator level. Limited availability of labor and high worker turnover are major problems for foodservice operators. Furthermore, liability costs for restaurants and institutions are rising due to employee accidents from handling knives, and the cost of kitchen space is increasing in urban areas. Consequently, foodservice demand for fresh-cut produce is expected to continue to expand.

The efforts of shippers to meet the special needs of foodservice users are complicated by the fragmented nature of the foodservice industry. In 1997 there were 385,400 restaurant establishments, with the top 100 chains accounting for half of sales, smaller chains and independents contributing 45.5%, and the second 100 chains accounting for the remainder (The Food Institute 1999a). There were a total of 201,520 quickservice ("fast food") restaurants and 183,880 full service restaurants, with the latter accounting for 51% of total restaurant sales on 48% of total units. Noncommercial units totaled 111,000 in 1999, with educational establishments the leading contributor to noncommercial sales, accounting for 38%, followed by extended care facilities at 9% (ERS estimate). The commercial sector accounts for 81% of the dollar volume of food and drink sold through foodservice channels, with the noncommercial sector accounting for the remainder (ERS estimate). The noncommercial sector accounts for a higher percentage of purchases than sales since commercial sales include higher profit margins. Some

estimates indicate that the noncommercial sector accounts for about two-thirds of foodservice purchases.

### CHANGING PROCUREMENT PRACTICES AND BARGAINING POWER

Increasingly, buyers are contracting with grower-shippers for high-volume perishable items in order to stabilize prices, qualities, and volumes. While contracts have been common in the foodservice sector, they are new to retail. In 1999, 49% of retailers surveyed in *Fresh Track 1999* reported that they used contracts for 11 to 25% of their purchases, while 16% of retailers reported that over 25% of their purchases were under contract (McLaughlin et al. 1999). Both of these rates are up from 8.5% and 2.1%, respectively, in 1994. The heavier users of contracts are the very largest firms (those with over $1.5 billion in annual sales), with 35% of this group purchasing over 25% of volume under contract, up from 0% as recently as 1994.

The introduction of contracting is likely to have structural implications at the grower-shipper level since shippers need to have sufficient scale to offer large, consistent, year-round volumes to meet buyer contracting requisites. To finance production in numerous production regions and manage complicated distribution logistics, shippers must meet "the test of capital," an especially formidable challenge for family-controlled firms (Wilson, Thompson, and Cook 1997).

The evolution of the produce industry has improved efficiency by cutting marketing costs and enhanced the communication of consumer demand back to growers. However, the consolidation of purchasing in the hands of a few large buyers raises concerns about oligopsony exploitation of producers. As noted earlier, perishable crops, which must be harvested, sold, and marketed within a very short time, tend to give growers relatively little bargaining power in dealings with buyers. Sexton and Zhang (1996) analyzed this issue in the California lettuce industry and found that buyers were able to reduce growers' profit to essentially zero.

In a recent study most shippers and retailers reported that the incidence and magnitude of fees (such as volume discounts and rebates) and services (such as third-party food safety certification and special packaging requests) associated with transactions had increased over the last 5 years (Calvin and Cook et al. 2001). Data were collected from commodity shippers on actual fees paid to the top five retailer and mass merchandiser accounts. They were usually around 1 to 2% of sales for most commodities. Bagged salad firms reported that fees ranged from 1 to 8% for all retail accounts. Fees paid to all retailer and mass merchandiser accounts averaged $5,200 and $8,700 per million dollars of sales for the interviewed grape and orange shippers, respectively, compared with $10,100 for the grapefruit shippers and only $1,300 for California tomato shippers. Services per million dollars of sales were less than fees for all the commodity samples, averaging from $1,200 for grapes to $4,400 for grapefruit. However, many firms did not keep close track of the cost of fees and, in particular, services. Hence, these data likely underestimate total costs.

Nevertheless, this research indicates that the increasing fees and services requested by retailers of shippers are potentially sufficient to make the difference between profit and loss, given the thin margins typically prevailing at the shipper level. This is especially true for commodity (as opposed to value-added) shippers, who act as price takers and are less able to pass costs along to customers.

## VALUE-ADDED PRODUCTS, BRANDING, POSTHARVEST HANDLING, AND SPECIALTY PRODUCE

### CONVENIENCE-ORIENTED FRESH-CUT PRODUCE

Prior to the early to mid-1990s, the vast majority of fresh-cut produce was sold in foodservice channels. Then, growing consumer demand for healthful and convenient food began to merge with advances in postharvest technology and handling that improved the quality, presentation, and shelf life of fresh-cut produce at the retail outlet. Bagged salads, broccoli and cauliflower florets, sliced mushrooms, cored pineapples, fresh-cut melons, stir-fry vegetable mixes, packaged baby carrots, carrot and celery sticks, and precut vegetables with cheese sauces in microwaveable trays are all examples of the attempt to add value to produce without losing its fresh, natural image.

According to *Fresh Trends 1998* (The Packer 1998), 84% of consumers had purchased

precut vegetables at least once in the prior 6 months, with 76% purchasing bagged salads and 42% purchasing fruit (The Packer 2000). In 1999, 93% of consumers reported having purchased either precut fresh produce in a bag or whole items in a bag or other container in the prior 6 months (ERS 1999).

The exact size of the rapidly growing U.S. fresh-cut industry is unknown. However, sales of precut vegetables at retail were $1.4 billion in 1997, according to Information Resources, Inc. (IRI) scanner data, and are now estimated to reach $2 billion, while Nielsen reported that bagged salads topped $1.73 billion in supermarket sales in 2000. Although retail fresh-cut annual growth rates have been slowing dramatically relative to 3 years ago, they are still impressive in the context of a mature food market. For example, the retail bagged salad category grew at an average annual rate of 61.5% from 1993 to 1996 in value, compared to 12% between 1998 and 1999 (IRI data). While fresh-cut fruit lags fresh-cut vegetables and bagged salads due to greater postharvest technology challenges, fresh-cut fruit sales via supermarkets were estimated to represent 3.1% of total retail produce sales in 1999 (Progressive Grocer 2000), or approximately $1.26 billion. Industry experts estimate that sales of all types of fresh-cut produce through foodservice channels are at least equal to sales via retail channels, although foodservice is now growing at a lower rate, estimated at 3 to 5% per year. The total estimated size of the U.S. fresh-cut industry in 1999 was $9 to $12 billion (IRI data).

The fresh-cut vegetable and salad industry has consolidated in response to the slowing growth rates, with many local and regional players being acquired by larger firms and marginal players being squeezed out of the business entirely. In 1999 three California-based firms controlled 86% of total bagged salad sales through mainstream supermarkets (IRI). The number of competitors outside the top five firms selling bagged salads to retailers shrank from 58 to 48 between 1994 and 1999 (Calvin and Cook et al. 2001). Some of the remaining processors who were unable to compete with the market leaders have shifted production away from branded products to private label (store label) or foodservice. Private label grew from 2.4% of national supermarket bagged salad sales in 1994 to 10% in 2000 (IRI data). Private label sales enable processors to utilize plant capacity without incurring the marketing costs associated with supporting brands, including slotting fees paid to retailers to secure shelf space (Calvin and Cook et al. 2001).

In some instances, major California processors have developed joint ventures with regional processors to expand distribution of their brands into new geographic markets. Throughout the 1990s a major industry debate existed over whether it was preferable to process at the shipping point, where product freshness is at its maximum level, or at the destination, where product reworking can occur. Net shipping costs are also lower if processing is done in the production point, since the finished product rather than the raw product is shipped. Both require optimal temperature management throughout the distribution system to maximize marketable yield.

It now appears evident that regional processing plants will play an important role due to their proximity to market and the demand for just-in-time deliveries. Local processors will continue to have a niche in supplying the more perishable fresh-cut products, such as chopped tomatoes and diced fruit, where proximity to market is a strategic advantage. Fruits are often still processed at the store level, and this practice is likely to decline as food safety regulations become more stringent, especially if HACCP programs were to be required of retailers. This would likely strengthen demand for the services of local and regional processors.

In short, better film technology and store-level temperature management have helped the fresh-cut industry to overcome its initial growing pains. Although it is clear that an increasing number of consumers and foodservice users are willing to pay for convenience-oriented produce, further consolidation among processors is expected as the industry matures.

## CONCEPT OF PRODUCE BRANDS

As vertical and horizontal integration increase in the fresh produce industry, investment in value-added products is stimulating new marketing and distribution strategies. For example, produce marketers are working with biotechnology firms to develop convenience-oriented products with unique

flavor attributes. Nonbiotech firms are exploring the link between improved, proprietary varieties and branding. However, while several firms have launched proprietary varieties, few have succeeded in either consistent sourcing of these products (both quality and volumes), or in protecting the integrity of their branded varieties from the intrusions of competitors with "me-too" products. Still, 19% of retail fresh produce sales were branded in 1997, up substantially from 7% in 1987 (Kaufman et al. 2000). Also, while produce is still sold predominantly in bulk form, packaged sales (including branded products) are growing, accounting for 41% of produce department sales in 1997 (Kaufman et al. 2000).

In general, successful produce brands have been limited because of the need for year-round availability; a consistent, high-quality supply; a differentiated product; and proper handling throughout the cold chain. Indeed, despite the intensified efforts to market branded produce during the 1980s, *Fresh Trends 1990* reported that most consumers still viewed branded produce as about the same quality as nonbranded produce (The Packer 1990). Furthermore, branding ranked last among numerous factors that influence produce purchases (see table 2.2).

The *Fresh Trends 2000* survey indicates that little had changed after several more years of branded marketing by more firms of more products. Only 28% of respondents stated that branded produce had better appearance, and only 15% ranked it as having better overall value than nonbranded produce. Just over two-thirds of respondents felt that the appearance and overall value of branded produce was about the same as nonbranded (The Packer 2000).

As recently as the *Fresh Trends 1998* survey, 60% of respondents said they do not seek out branded produce when they shop (The Packer 1998). Of those seeking a brand, consumers are much more likely to seek out branded fruit than vegetables. In 2000, bananas continued to lead the way among consumers seeking out a fruit brand, mentioned by 22%, followed by oranges at 5% and pineapples at 4%. To date, most brand recognition is for fruit items with few value-added attributes, with the exception of pineapple, which is sold in both bulk and fresh-cut form. On the vegetable side, the principal brand recognition was for lettuce and bagged salads, with 3% each of consumers expressing a preference for either a lettuce or bagged salad brand. This low recognition for bagged salads is despite rapid growth in branded bagged salad sales, highlighting the difficulty of obtaining true consumer franchises for fresh produce, even when sold in value-added fresh-cut form.

According to *Fresh Trends 2000*, the specific brands with the greatest recognition were Dole, with 21% of consumers saying they sought this label; Chiquita, at 12%; Sunkist, at 6%; and Del Monte, at 4%.

The many obstacles to developing widely recognized consumer brands for fresh produce has meant that fresh produce has been undermerchandised and underpromoted relative to packaged food products. This gap has traditionally been somewhat mitigated through generic promotion programs paid for by commodity growers and shippers via mandated marketing programs. However, this type of program has recently become more controversial, raising questions about the future role of generic promotion, in particular in light of the continued growth in attempts at branding and product differentiation on the part of shippers in many commodity subsectors. Recent research at UC Davis documented the net benefits to producers who pay for generic advertising, based on results from numerous studies of a variety of commodities (Crespi 2000). However, it also showed that although not necessarily the case, it is possible for an increase in generic advertising to differentially affect the profits of competing firms, such that a firm selling higher-quality goods would prefer less generic advertising than a firm selling lower-quality goods. Another challenge to the future of generic promotion is the increasing cost, as retailers now tend to require more funds than in the past in exchange for participating in joint promotion programs.

While generic promotion programs have played an important role in promoting unbranded produce, successful brands have the potential to stimulate even greater consumption of produce. Brands tend to bring additional promotional dollars, injecting a positive advertising and merchandising jolt to their categories, independent of their success in achieving consumer recognition of a specific brand.

For example, banana consumption appears to have benefited from the presence of several strong brands, with U.S. per capita consumption growing from 8.8 kg (19.4 lb) in 1976 to 14.2 kg (31.3 lb) in 1999. Brands may be even more effective when combined with other value-added features, such as washed baby carrots, carrots in snack packs with dips, or carrots in resealable packaging. The introduction of new presentations of branded carrots may have played a positive role in stimulating carrot demand, with fresh per capita consumption up from 3.5 kg (7.7 lb) in 1991 to 5 kg (11.3 lb) in 2000.

Whether brands can profitably develop a product category is another matter. The interaction between produce brands and slotting fees varies by product form and may potentially influence the profitability of branded strategies. Branding of produce commodities as opposed to fresh-cut produce does not appear to have led to significant use of slotting fees. In contrast, branded fresh-cut produce is treated more like a manufactured food product (where slotting fees are common) because it is consistently available year-round with standardized quality and requires dedicated shelf space. This similarity has likely contributed to the growth of slotting fees in the fresh-cut category. Market share battles between fresh-cut processors have also likely contributed to slotting fees, as the industry structure is quite concentrated for those processors who focus on retail sales, and rivalry between firms is high. Slotting fees are sometimes offered as a tool for capturing market share from competitors. Yet the inability of processors to achieve strong consumer brand recognition arguably means that they are still subject in part to commodity market dynamics. This may make them vulnerable to greater marketing costs without reaping all of the rewards normally associated with branded food marketing.

## POSTHARVEST HANDLING

The importance of proper postharvest handling and temperature management in stimulating sales is highlighted by the results of two *Fresh Trends* surveys, the first conducted in 1990 and the second a decade later in 2000 (published in 2001) (table 2.2). In both years the top three factors ranked by consumers as most influencing their buying decisions were taste or flavor, ripeness, and appearance. Consumers clearly base buying decisions on what looks good and appears likely to taste good. Least influential are the geographic origin of the product and whether it was organically grown. Indeed, these are ranked as even less important today than in the past, with price and nutritional value also becoming less important to consumers. Declining consumer concern about nutrition has been documented in many surveys pertaining to food products in general, likely because today many consumers feel that they are making healthier food choices, making this issue of less concern. Appearance became less important to consumers in 2000 than in 1990 but more important than ripeness, moving up to the number two ranking.

The importance of in-store merchandising, appearance, and freshness is underscored by the extent of impulse purchases of produce. Only 32% of consumers report shopping with a written or mental list of the produce items they plan to buy, while 39% decide in the produce department and 29% just know the general category of produce they plan to buy. Shelf positioning and merchandising are critical given the high level of product diversity, and optimal postharvest handling is equally critical to maximizing sales potential.

The rise in product diversity has also greatly increased the volume of mixed (consolidated) load shipments from production regions. Mixed loads, due to temperature and ethylene incompatibilities, create notable postharvest handling challenges. There is an ongoing need for training and education in appropriate handling methods, and there is also a growing market demand for innovative handling technologies, such as pallet-level modified atmospheres.

## SPECIALTY PRODUCE

During the last 15 years, a niche market has rapidly developed for unusual or exotic produce. Larger ethnic populations and the growth in their cultural expression have augmented the demand for product diversity as these consumers seek out traditional foods. Furthermore, a broader portion of the population is consuming foods once considered ethnic or regional. About 75% of ethnic food sales are estimated to be destined for

**Table 2.2.** Factors indicated by consumers as influencing produce purchases, 1990 and 2000

| | Rating of extremely or very important (%) | |
|---|---|---|
| **Factor** | **1990** | **2000** |
| Taste or flavor | 96 | 87 |
| Ripeness | 96 | 70 |
| Appearance or condition | 94 | 83 |
| Nutritional value | 65 | 57 |
| Price | 63 | 47 |
| In-season | 38 | 41 |
| Growing region, state, or country of origin | 17 | 14 |
| Organically grown | 17 | 12 |
| Brand name | 9 | NA* |

*Source:* The Packer 1990, 2001.
*Note:* *NA = not available

mainstream consumers or ethnic consumers outside the original audience (Produce Marketing Association 2000). Ethnic food sales are expected to reach $383 million in 2001, up from $272 million in 1996, and about 15% of the growth in food sales over the next 10 years is forecast to come from ethnic foods (Produce Marketing Association 2000). Italian food is the most frequently consumed ethnic food in the United States, followed by Mexican.

Another expanding segment of specialty produce is varieties of traditional items grown primarily for their eating characteristics (superior taste) rather than for yield or shipping attributes. Common examples are Blenheim apricots, special varieties of vine-ripened tomatoes, tree-ripened peaches (including white-fleshed cultivars), donut peaches, Pink Lady and other specialty apples, and super-sweet white and yellow sweet corns. Many of these, available years ago, are marketed as "heirloom" varieties. "Boutique growers," farmers who target restaurant chefs and upscale consumers that are willing to pay a premium, produce them. Indeed, specialty products are generally introduced to the American palate first through upscale and ethnic restaurants and farmers' markets, and then through exotic produce sections in supermarkets. Most successful items eventually are included in conventional produce displays.

Information on specialty produce volume is available primarily for vegetables and herbs rather than specialty fruit. Shipments of specialty fresh vegetables reached 1,247.4 million kg (2,750 million lb) in 2000, up from 258.9 million kg (570.8 million lb) in 1984 (ERS 2001). Despite the rapid growth, specialty vegetables still represent only a 6% share of U.S. vegetable shipments, which totaled 21,708.6 million kg (47,858.5 million lb) in 2000. Included in the specialty shipments are less-than-exotic items, such as romaine lettuce, representing 34% of total shipments. Next in importance are tropical vegetables, followed by other specialty lettuces, and then chile peppers. Forty-one percent of 1999 fresh specialty vegetable shipments were imported (ERS 2000c), compared with 14% of all fresh vegetable consumption (ERS 2000d). California is the largest producer of specialties, in 1999 harvesting 158,257 ha (391,054 acres) of specialty and minor vegetables for both the fresh and processed markets, yielding total production of 2,582 million kg (5,692 million lb) valued at $1.9 billion (ERS 2001).

Another type of specialty produce experiencing rapid growth is organically grown fruits and vegetables. In 1999 organic fresh produce was estimated by Progressive Grocer (2000) to account for 1.5% of supermarket produce department sales, approximately equivalent to $609 billion, while *Fresh Track 1999* estimated organic fresh fruit and vegetable sales at 1.7% of produce department sales. Hence, despite the rapid growth of the organic fresh produce industry, it is still a niche market and therefore easily saturated. Still, the quality and availability of organic produce is improving, which should continue to stimulate distribution. Organic products that tend to be most successful are those that are not significantly more expensive than conventional produce, have similar appearance, and are consistently available, such as organic bagged salads and carrots.

Of the shoppers surveyed in the *Fresh Trends 2000* study, 35 and 82%, respectively, said that they bought organically grown fruits and vegetables in the prior 6 months, and satisfaction with product quality and value was high. On the other hand, in 2000 only 12% of consumers ranked as important whether produce was organically grown, down from 17% in 1990 (table 2.2), helping to explain the small organic sales relative to total produce sales. Still, today there appears to be a consumer segment more loyal to organics, with a higher purchase frequency than a decade ago.

The Hartman Group (2000) estimates that 18% of U.S. consumers are strongly interested in buying organic produce, meaning that they are interested enough to be willing to pay a price premium, accept lower quality, or seek it out in less convenient outlets. There is a larger segment of consumers, 28%, that is generally interested in organic produce but tends to purchase only sporadically when organic produce is conveniently available at a price and quality similar to conventional. The remaining 54% of the population is either ambivalent or uninterested. To grow the organic industry into more than a niche market it will be necessary to motivate the generally interested consumers into becoming more frequent users.

The total 2000 U.S. organic foods industry was estimated at $7.8 billion, up from $1 billion in 1990 (Organic Trade Assn.), equivalent to 1.4% of retail food sales that year. The Henry A. Wallace Institute estimated the larger natural foods market, of which organic foods are a part, at $11 billion in 2000. Organic foods are still sold predominantly through retail channels, with foodservice sales generally limited to a segment of very exclusive restaurants. In California, which is the leading producer of organic fresh fruits and vegetables, the 1998 farm gate value of organically grown vegetables was $86.1 million, while fruits and nuts contributed $48.1 million (Klonsky et al. 2001), with the combined sales equivalent to about 0.5% of California's agricultural output.

As of February 20, 2001, the first-ever National Organic Program (NOP) went into effect, with full implementation of the rules expected at the end of 18 months. The NOP will standardize production, handling, labeling, certification, and other requirements for organic foods and is expected to stimulate the development of the organic market by increasing consumer and trade confidence in organic foods.

## CONCLUSIONS

Per capita consumption of fresh produce expanded over the last 25 years, even as the U.S. food market matured. Still, fresh produce firms face numerous challenges as they attempt to stimulate greater fresh produce consumption, given the array of food alternatives available to increasingly time-pressed consumers. However, the emergence of the fresh-cut industry, the still-rising consumer awareness of the health benefits of fresh produce, and continued improvements in postharvest handling and transportation technologies should further improve the distribution system for highly perishable fruit and vegetable commodities, potentially stimulating demand. Certainly, demand for even better performance will increase as product diversity grows, postharvest fungicides become less available, and world trade expands. Successful produce marketing firms will become more market-driven, identifying and meeting the specific needs of each market segment for quality, packaging, product form, merchandising, and information. The most proactive firms will go even further, becoming account driven and acting as partners helping to meet the needs of individual accounts. This is part of a supply chain management approach, emphasizing faster delivery, more accurate temperature management, improved packaging technologies, and creative merchandising, all based on better demand information.

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