



Courtesy Florida Fruit and Vegetable Association

Americans Relish Cucumbers

Two common phrases—“cool as a cucumber” and “in a pretty pickle”—might be used to characterize the two segments that make up the market for cucumbers, fresh-market sales and processed products. Demand for fresh-market cucumbers has been on the rise, while consumption of processed (pickled) cucumbers has been slowing. In general, however, cucumber use in the U.S. has been growing, with consumption totaling 3 billion pounds in 1999—up from 2.5 billion 10 years before and continuing the steady climb that began in the 1960’s.

Once considered mere animal fodder, “cukes” are now an important commercial and garden vegetable. The U.S. produces 4 percent of the world’s cucumbers, ranking fourth behind China, Turkey, and Iran. The U.S. cucumber industry is unevenly spread across the 50 states, with 171,000 acres and 6,821 farms that ship into the fresh or processing markets. Cucumbers had an average farm value of \$361 million annually during 1997-99.

Cukes for the Fresh Market Or Processing

Thought to have originated in India, cucumbers have been cultivated for thousands of years. Brought to the New World by Columbus, cucumbers have been culti-

vated in the U.S. for several centuries. Cucumbers are members of the cucurbit family and are related to gourds, gherkins, pumpkins, squash, and watermelon. *Cucumis sativus* is the common slicing (including greenhouse) and pickling species, while *cucumis anguria* is the gherkin type common in India and Africa, and is frequently used to make pickles.

The U.S. produced 2.4 billion pounds of cucumbers for all uses in 1999—about equally split between the fresh and processing markets. While fresh-market cucumber production has been trending upward, reaching a record high in 1999, average pickling output fell 3 percent in the 1990’s compared with the 1980’s. Fresh-market cucumbers are grown year-round, while pickling cucumbers are harvested mainly in the spring and fall.

The three basic classes of cucumbers marketed in the U.S. are field-grown slicers, greenhouse-grown slicers, and processing (pickling) cucumbers. Field-grown slicers (cucumbers for the fresh market) are larger, sweeter, and have thicker skins than the smaller, thinner skinned pickling varieties that are straighter than slicing cukes. “English” or “European” cucumbers are so-called seedless varieties originating in Europe and can be field grown or produced in hothouses. European varieties

tend to be long, cylindrical, and tender-skinned, and have a milder flavor than most field-grown slicers.

Shipping-point (farm-gate) prices for fresh-market cucumbers have averaged about 19 cents per pound over the past 3 years (1997-99)—up 9 percent from the previous 3 years. During the same time, the price of pickling cucumbers at the processing-plant door averaged 12 cents per pound—up 3 percent from the previous 3 years. In real terms, prices for both fresh and processing cucumbers have trended downward over the past 30 years—prices are 20 to 30 percent lower than in 1970, likely reflecting increases in per acre yields.

Monthly prices for pickles or pickling cucumbers are not available, but USDA does collect price data on fresh cucumbers. Prices for fresh cucumbers are generally higher from January to April because of limited domestic supplies, and lowest in June when supplies are available from many areas. The farm price (shipping-point) represents about 25 percent of the retail value for fresh cucumbers.

Trade is a key component of the U.S. fresh-market cucumber industry. About 8 percent of fresh-market volume was exported during the 1990’s—virtually the same as the 1980’s. However, export share has been declining since the late 1980’s and stood at 4 percent in 1999. Canada takes 98 percent of U.S. fresh cucumber exports, but Canada’s imports have declined 20 percent since 1997, possibly reflecting increased consumption of domestic greenhouse cucumbers.

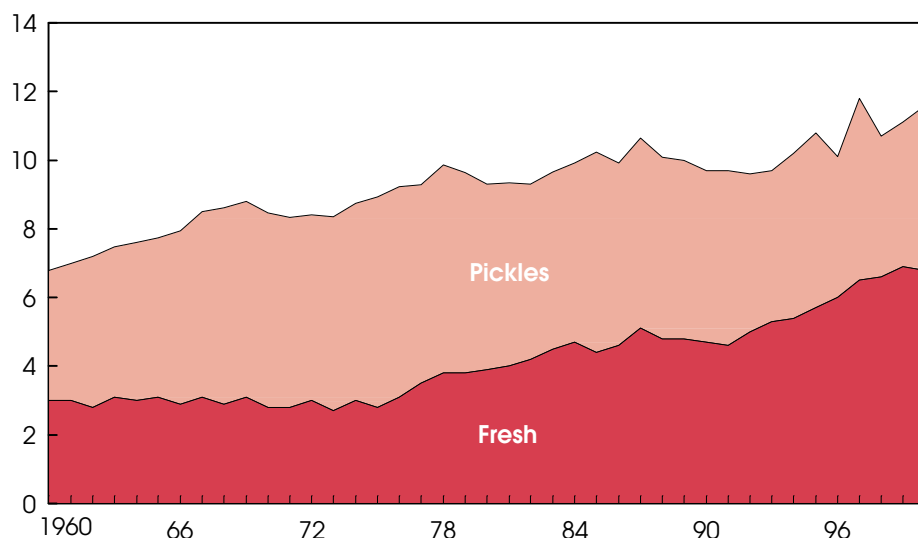
U.S. pickle exports have been relatively constant over the past 5 years, accounting for 2 percent of pickling cucumber supply—up from 1 percent or less in the years prior to 1995. The U.S. exported pickles to 38 countries in 1999, with three-fourths of the volume going to Canada, South Korea, and the Netherlands.

Imports of fresh cucumbers are highest in January and February when U.S. production is limited by cool weather, and lowest in summer during the height of the domestic growing season. Imports accounted for 38 percent of U.S. fresh

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Fresh Cucumbers Have Propelled Consumption Growth

Lbs. per capita



Economic Research Service, USDA

cucumber consumption in the 1990's—up from 37 percent in the 1980's and 30 percent in the 1970's. The volume of fresh imports in 1999 was 90 percent larger than in 1990, with the majority shipped from Mexico. Under terms of the North American Free Trade Agreement (NAFTA), Mexico faces a small, but declining (15-year phaseout) tariff from March through May and October through November; in contrast, cucumbers from Canada enter duty-free all year. The strong U.S. dollar and the popularity of European-type greenhouse/hydroponic cucumbers has encouraged imports from Canada to rise fourfold since the mid-1990's. Imports from Canada now account for 5 percent of U.S. imported fresh-market cucumbers.

Imports of pickling cucumbers have been on the rise since the mid-1990's. Prior to 1993, imports accounted for 1 percent or less of pickling cucumber consumption, but reached a peak of nearly 8 percent in 1999. Recent gains reflect imports of finished products (pickles ready for immediate consumption) from Canada and India and a rising volume of bulk unfinished pickles (in brine, requiring further processing) from Honduras and India. Bulk unfinished pickle imports totaled 50 million pounds, product weight, in 1999—up from just 7 million pounds in 1990. Bulk

gherkin imports from India have apparently found favor with both U.S. and Canadian processors due largely to their low cost and consistent sizes.

Production Is Concentrated

Florida is the leading cucumber state, producing 19 percent of the nation's output during 1997-99. Nearly half of Florida's cucumber crop is grown in Manatee and Palm Beach counties. Florida is the leading fresh-market supplier and is fourth in pickling cucumbers. Florida ships fresh cucumbers from October through June, with a lull in January and February due to the threat of freezing weather. Imports from Mexico fill this winter gap.

Michigan is a close second, producing 18 percent of the nation's cucumbers. One-third of this output comes from Van Buren and Allegan counties. Michigan is the leader in pickling-cucumber production, with two-thirds of the state's production going to several pickle packers, including the nation's largest pickle manufacturer. Michigan's 455 cucumber farms are also fourth in fresh-market production, with shipments from late June through early October.

According to the 1997 Census of Agriculture, third-ranked California has

431 farms that harvest cucumbers. The Golden State produces 11 percent of the nation's cucumbers, with three-fourths for the fresh market. About 80 percent of the state's cucumbers are shipped from San Diego and San Joaquin counties. Most of California's fresh-market cucumbers are shipped from May to November.

In the U.S., there is limited overlap between the fresh and processing cucumber industries because of differences in varieties, as well as in production and marketing methods. For example, all fresh-market cucumbers are harvested by hand, while many pickling cucumbers are harvested by machine. According to Pickle Packers International, a national trade association, about two-thirds of the cucumber crop in the northern U.S. (e.g., Michigan), one-third of the crop in the western U.S. (e.g., California), and less than 10 percent of the southern cucumber crop (e.g., North Carolina) are harvested by machine. Another difference is that the majority of pickling cucumbers is produced under contract, while most fresh-market cucumbers are sold in the open (spot) market.

Cucumber Consumption Rising

Nutritionally, cucumbers are about 96 percent water, low in calories, and free of fat, cholesterol, and sodium. About 100 grams of fresh cucumber (about a cup of slices) contains 10 percent of the daily requirement for vitamin C. (Columbus carried pickled cucumbers on ocean voyages to help stave off scurvy.) One-eighth of a cup of pickles also counts as one serving of fruits and vegetables under the National 5-A-Day program.

Fresh cucumbers are used in a wide variety of salads, but are also typically consumed as sticks for vegetable platters and vegetable dips, baked, sliced as a garnish, diced for use in gazpacho, and blended into other soups. Cucumbers grown for pickles are also favored by some consumers as a fresh vegetable because of their tender, thinner skins. Rising fresh-market consumption likely reflects the popularity of salads, an increasing interest in greenhouse cucumbers, and the general trend toward more healthful lifestyles.

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Pickled cucumbers are most often used as a sandwich side dish, but are also a popular snack item right out of the jar. Dozens of firms across the country produce cucumber pickles and relish. According to the 1997 Census of Manufacturers, manufacturer shipments of cucumber pickles and relishes totaled more than \$1 billion. Dill cucumber pickles represented about half of this value, followed by sweet pickles and refrigerated pickles.

Consumers have been moving away from salty foods over the past 15 years, and the pickle industry has been changing to accommodate them. The average pickle’s salt content today is lower than the 1970’s and 1980’s because fresh-pack pickles are a larger share of the market and contain less sodium than fermented pickles. Although low-sodium pickle products have not gained wide acceptance, the demand for high-grade, mild (low salt and low acid), refrigerated pickles has increased over the past 10 years, and packers have responded with a range of products.

Per capita use of cucumbers has risen during each of the past four decades. Use totaled 10.3 pounds in the 1990’s, up from 9.8 in the 1980’s, 8.9 in the 1970’s and 7.8 pounds in the 1960’s. Pickling use

has been on a slow decline since peaking in 1976 at 6.1 pounds per capita. Therefore, fresh-market use has accounted for all the growth over the past 20 years. Fresh use reached a record high 6.9 pounds in 1999—44 percent higher than 1989. Although per capita use of pickling cucumbers has waned during the past two decades, the 4.2 pounds used per person today is still greater than at any time before the mid-1960’s.

About 60 percent of cucumber consumption is in fresh form with the remainder in pickled products. Because cucumbers consist largely of water, they lack the characteristics (primarily sufficient solids) necessary to be ingredients in commercial frozen and dehydrated foods. According to the USDA 1994-96 Continuing Survey of Food Intakes by Individuals, 85 percent of fresh cucumbers are consumed at home. This may reflect limited uses for fresh cucumbers on standard restaurant menus.

When cucumbers are pickled, the range of uses widens. Reflecting this, 45 percent of pickled cucumbers are consumed away from home. One-third of all pickled cucumbers are used in fast foods, largely in sandwiches (e.g., hamburgers and subs) and associated condiments (relishes). As

for fresh cucumbers in the away-from-home market, U.S. consumers most often eat fresh cucumbers in standard “white tablecloth” restaurants (9 percent). In contrast, these restaurants account for less than 6 percent of pickled cucumber consumption. Fresh cucumber shippers have been able to carve only a small niche in the fast-food market, which is responsible for just 2 percent of fresh cucumber consumption.

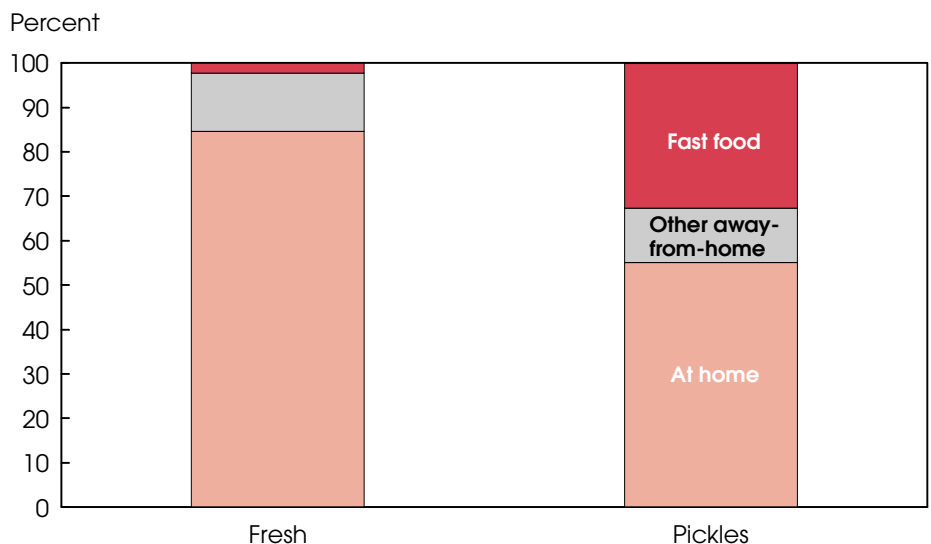
Who Eats Cucumbers?

Regional breakdowns indicate that fresh-market cucumbers are most popular among consumers in the Northeast (a 9-state region defined by the Census Bureau) and the West (a 13-state region). Together these two regions account for 42 percent of the nation’s population but 49 percent of fresh cucumber consumption. For consumers of pickled cucumbers, those in the Midwest and, to a lesser degree, the South consume proportionately more than other regions of the country. About 55 percent of fresh cucumbers are consumed in suburban America, where 47 percent of the nation’s population resides. Both rural and metro area consumers eat less than their “share,” as defined by their percentage of the U.S. population.

USDA’s food-intake survey also gauged cucumber consumption nationwide by racial group, which revealed some interesting variations. The survey found that non-Hispanic white and black consumers show a greater preference for pickles than for fresh cucumbers. This was especially true of black consumers, who represent 13 percent of the population but consume less than 6 percent of fresh cucumbers. The opposite was true of Hispanics, who represent 11 percent of the population but consume 13 percent of fresh cucumbers and 8 percent of pickled cucumbers. Other ethnic groups (largely Asian) also favor fresh cucumbers over pickled products. These consumers account for 4 percent of the population, but use 10 percent of all fresh cucumbers and 3 percent of total pickled cucumbers.

The wealthiest consumers appear to favor cucumbers the most. Households with incomes at least three-and-one-half times greater than poverty-level income (the cut-off point for food stamp eligibility is

Most Fresh Cucumbers Are Consumed at Home, While Pickles Are Popular as Fast Food



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Pickle Primer

Along with drying and dehydrating, pickling is one of the oldest forms of food preservation. Although many vegetables, including beets, cabbage, and peppers, are sold in pickled form, the cucumber is the leading vegetable pickled in the U.S. Pickling cucumbers are smaller, have thinner skins, and are straighter than most slicing cucumbers. The wide variety of pickle flavors is made possible by the addition of various herbs, spices, and seasonings to the pickling liquid. A substantial volume of pickling cucumbers is used to produce relish, a popular condiment. Most relish is made by chopping cucumbers, acidifying them with vinegar, adding seasoning, and then packing and pasteurizing.

There are several types of pickles in the market. Some of these include:

- **Dill**—by far the most popular. The flavor in dill itself comes from seeds of the plant, which contain the substance carvone. Most processors use dillweed oil rather than dill seed to ensure consistent flavor (the same amount of carvone) from batch to batch. Dill pickles are sold as genuine dills, kosher (which for most consumers means garlic has been added to the brine), Polish (which are usually slightly spicy, similar to kosher), German style, and others.
- **Sweet**—the second-most popular. These include bread-and-butter pickles, no-salt pickles, and various sweet-hot varieties.
- **Sour and half-sour** pickles. These are fermented and not pasteurized.

Pickles come in a variety of styles. Some of these include whole (gherkins, midgets), halves, quarters, slices, spears, strips, chips, chunks and sandwich (sliced lengthwise). Relishes are sometimes considered another style of pickle.

Pickles can also be identified by production method:

- **Refrigerated**—accounts for about 20 percent of sales. These are fermented under refrigeration using minimal processing, which keeps them crispy. These have a short shelf life (about 4 months) compared with other packs. This method can be used to produce various dill, half-sour, and sweet pickles, as well as relish.
- **Fresh pack**—pickles produced this way tend to be more crisp and less acidic than processed pickles. This method is used to produce kosher dills, chips, spears, halves, sweet pickles and relish. This pack has an 18-month shelf life.
- **Processed**—the most time-consuming method. Pickles made this way are fermented (cured) in bulk brine tanks for 1 to 3 months and then packed into jars. This method produces dark green pickles with a sharp flavor. Some examples include kosher dills, genuine (which usually means fermented) dills, sours, and sweet pickles. This method also provides for the longest shelf life—2 years. The typical pickle slice on a hamburger is a processed (fermented) pickle.

Specialty Cukes

There are several specialty cucumber varieties that largely serve ethnic markets. Some of these include:

Armenian cucumbers, which are often found in Mediterranean markets. These cucumbers are green with deep ridges and measure up to 3 feet long. They are sometimes referred to as snake cucumbers or snake melons.

Yamato Extra-Long, commonly seen in Oriental food markets, are dark green, “burpless” (seedless), and can measure up to 2 feet long.

Lemon cucumbers are American heirloom varieties that resemble lemons, but are very mild.

130 percent of the poverty level), who represent 39 percent of the U.S. population, consume 42 percent of both fresh and pickled cucumbers. The 19 percent of the population who earn the lowest incomes consume less than their share of both fresh and processed cucumbers.

Men eat slightly more fresh cucumbers than women—51 percent of the total consumed. This may largely be explained by the higher caloric intake of men. In general, the survey indicated that as consumers age, they tend to eat more fresh vegetables, including cucumbers. People under the age of 20 represent 30 percent of the population but consume just 18 percent of all fresh cucumbers. Both men and women over the age of 20 eat more than their proportionate share of fresh cucumbers.

Interestingly, for processed cucumbers, the story is nearly reversed. Men and women under the age of 20 consume a larger per-

centage of pickles than fresh cucumbers—25 percent—but still less than their proportionate share. And consumers over the age of 60 (16 percent of the population) used just 11 percent of the pickled cucumbers, likely reflecting the desire to reduce sodium in their diets. However, the largest consumers of pickles are men between the ages of 20 and 59. Men in this age group account for 27 percent of the population yet reported consuming 39 percent of the pickled cucumbers.

Given a strong economy and continued consumer interest in health and flavor, both sides of the cucumber industry can enter the new millennium on an optimistic note. Current forecasts indicate per capita use should increase for both fresh cucumbers and pickles in 2000. **AO**

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