

Guacamole from Mexico Fuels Surge of Avocado Imports

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This article looks at factors associated with recent rapid growth in demand for processed avocados, including adaptation and adoption of High-Pressure Processing (HPP) technology. California producer- and importer-funded research and promotion programs have changed avocados' image to that of a healthy super-food. Expanded imports from Mexico have improved year-round availability of fresh and processed products, and guacamole's popularity.

Strong increases in U.S. consumption of processed avocado products have been largely overlooked, while popular attention has focused on the demand for fresh avocados. The major reason for this gap in knowledge is a lack of reliable statistics on avocado processing and U.S. sales of processed avocado products. Despite the significant data issues associated with measurement of processed avocado sales and consumption, there is an important story to be told. Avocados are a healthy, nutrient-loaded food product and U.S. consumption has grown rapidly. Processed avocado imports from Mexico have recently accelerated and their continued growth has important implications for U.S. producers, consumers, and the Mexican avocado industry. Sound economic reasons support Mexico's dominance in supplying processed avocado products to the U.S. market, and the underlying factors fueling recent growth of processed avocado imports are expected to continue.

Processed Avocado Imports

Avocados have evolved from a seasonal specialty to a year-round staple in both the supermarket produce aisle and consumer diets. U.S. fresh

avocado consumption increased from 1.47 pounds per capita in 1989 to 8.07 pounds in 2019, with Mexico accounting for most of the increased supplies. At the same time, U.S.-processed avocado imports increased from a minuscule 0.01 pounds per capita in 1989 to almost 0.75 pounds in 2019, with Mexican product dominating imports. The processed import share of total U.S. avocado consumption increased from less than 0.5% (product weight) in 1989 to 8.5% in 2019.

Figure 1 shows the growth in processed avocado imports from 1989 through 2019. Growth was slow and steady through 2016, and then accelerated from 2017 through 2019. Processed avocado imports first exceeded 50 million pounds in 2000. It took another 11 years of growth to exceed 100 million pounds in 2011. With explosive growth beginning in 2017, it took only three years to add almost 100 million more pounds of processed imports.

The stair step pattern of growth in processed imports appears to be partially due to the addition of new processing capacity and establishment of new plants in Mexico over time, as well as increased market penetration for

processed products. New avocado processing capacity is lumpy, even though the product mix can be flexible. The description of an avocado processing plant recently brought online in Mexico is illustrative. The plant has 190 employees operating two product lines with two high-pressure processing (HPP) machines, four packaging machines, and a capacity of 55,000 pounds of processed product per day. This plant, operating five days per week for 50 weeks can add 13.75 million pounds annually to processed avocado supply and exports.

U.S.-processed avocado imports are comparatively large when measured against total California avocado production. California produced an annual average crop of about 290 million pounds of fresh avocados for the five years from 2015 through 2019. Processed avocado imports totaled 246.6 million pounds (product weight) in 2019, but were certainly much higher in terms of the fresh-product equivalent. Research sponsored by the California Avocado Commission (CAC) indicates that the average yield of edible product for Hass avocado sizes 36 through 84 is 70%. One

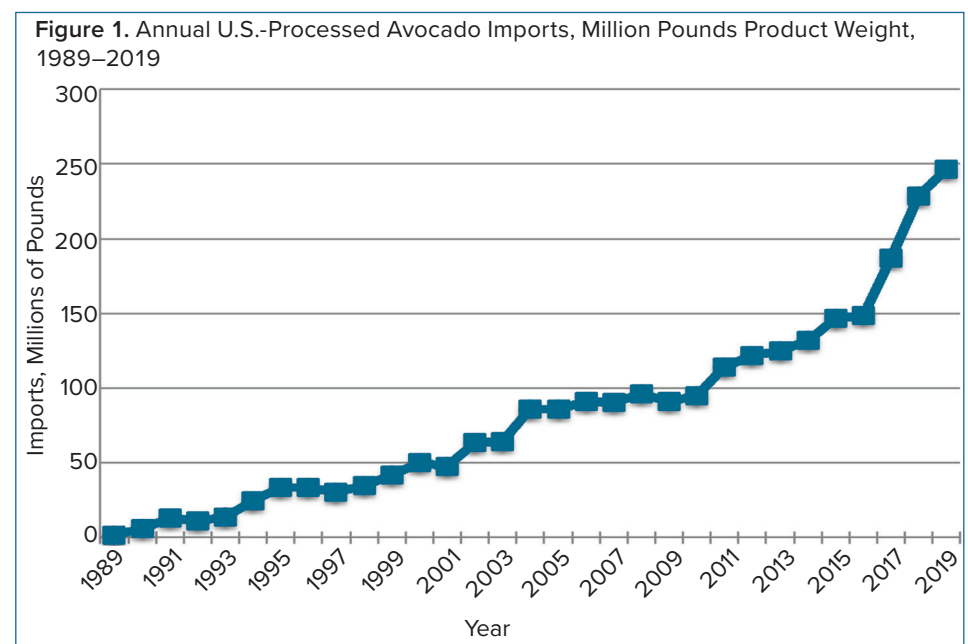
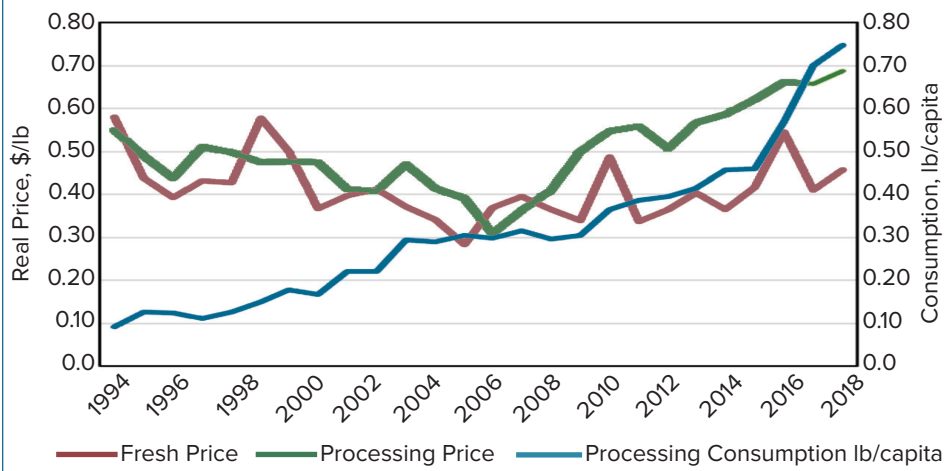


Figure 2. U.S.-Processed Avocado Imports with Real (1982–84 = 100) Port of Entry Processed Prices and Real Fresh F.O.B. Prices, 1994–2019



pound of processed avocado is thus equivalent to about 1.43 pounds of fresh avocados. A further complication is that some processed products such as guacamole contain other ingredients. Overall, it is likely that 2019 processed avocado imports required some 350 million pounds of fresh avocados. This amount exceeds the recent 5-year average California production by almost 20% and not all of the imported product was included in the processed import data. Some of the shortcomings in processed avocado data are discussed below.

Processed Avocado Data Issues

There are two reasons for shortcomings in U.S.-processed avocado consumption data. First, the USDA and California did not report processed utilization of the California avocado crop because of confidentiality requirements. Thus, even though Calavo processed as much as 20 million pounds of guacamole and other avocado-based items annually in its Santa Paula, California plant from 1974 until it was closed in 2003, all of California’s production was reported as fresh sales and consumption. Second, after the California plant closure in 2003, the U.S. became dependent on imports for almost all of its processed avocado needs. While the U.S. reports quantity and value of processed avocado imports, the data are incomplete because several processed avocado

products are not reported separately. For example, frozen avocados (without additives) are reported in a category that includes all frozen fruits.

Mexican Avocado Processing

It is no accident that Mexico accounts for nearly all of the supply of processed avocado products in the U.S. market. It is the world’s largest avocado producer, with year-round production and with labor readily available at lower wage rates than in the United States. In addition, U.S. markets are readily accessible to Mexican producing areas, major U.S. avocado marketing firms have significant investments in the Mexican avocado sector, its planted acreage continues to expand significantly, and it is the world’s low-cost producer. Mexico has all of the necessary inputs for continued expansion. California’s largest avocado processor’s move to Mexico in 2003 was dictated by Mexico’s clear advantage in comparative costs of production for avocados.

The UN’s Food and Agriculture Organization (FAO) reported that 14 firms processed Mexican avocados in 2013. Included were a combination of Mexican, U.S.-based, and international firms. Mexico’s dominance in supplying processed avocados to the U.S. market has increased steadily over time. During the four years from 2011 through 2014, Mexico accounted for 93.4%, with Peru a distant second at 4.9%. During 2019,

the Mexican-sourced share of U.S.-processed avocado products increased to 97.9%, while Peru’s share declined to 1.1%.

U.S.-Processed Avocado Demand

The channels of distribution differ for fresh and processed avocados. The California Avocado Commission (CAC) estimates that for fresh avocados, 70% of annual sales are directly to consumers and 30% are through food service channels. The ratios are reversed for processed avocados. Convenience, together with dependability of supply, uniform quality, and consistent taste are important product attributes for food service firms.

Examination and comparison of real price and consumption data for processed avocado imports provide some clues to the nature of demand for processed avocado products. While imports of processed avocados increased from less than 0.1 pounds per capita in 1994 to 0.75 pounds per capita in 2019, processed consumption remains far below U.S. fresh avocado consumption of 8.07 pounds per capita in 2019. Annual U.S. per capita processed avocado imports are shown in Figure 2, together with port of entry processed prices and weighted annual fresh avocado prices. Average annual fresh avocado prices consist of a quantity weighted average of California and Florida f.o.b. prices and all fresh avocado imports at port of entry. As noted earlier, the incomplete per capita processed import data are product weight rather than fresh equivalent. Despite these shortcomings in measurement, the increasing pattern of processed imports is similar to per capita fresh avocado consumption.

While the overall pattern of fresh and processed avocado prices are similar over the period from 1994 through 2019, with real prices reaching lows in 2006 and 2007, the relationship between the two series does not meet expectations for close substitutes until after 2008.

That is, if fresh and processed avocados are close substitutes, we would expect fresh and processed prices to show similar adjustments over time—but with processed prices above fresh prices to reflect processing costs and equivalence.

The pattern of comparative prices prior to 2008 could be due to a combination of factors including, (1) fresh and processed avocados were not regarded as close substitutes in many applications due to processing methods used, (2) demand factors differ in at-home and institutional outlets, (3) annual averages may not capture differing seasonal patterns of supply and demand, and (4) avocados utilized for processing may not be suitable for fresh market sales.

Factors Associated with Increased Demand

Existing data, while incomplete, show a significant increase in processed avocado imports and consumption over time. Several factors contributed to increased U.S. imports of fresh and processed avocados. These included:

- Nutrition and health research funded by the CAC;
- The phased opening of the U.S. market to fresh Mexican avocados;
- Approval of the Hass Avocado Promotion, Research, and Information Order that supports research and promotion programs for all fresh Hass avocados marketed in the U.S.;
- Growth of Mexican and Hispanic restaurants and menu items;
- Increasing availability of avocado imports from Mexico, Chile, and Peru;
- Active involvement of U.S.-based firms with extensive experience in avocado packing and processing.

Economic analysis of the growth of consumer demand attributes an important role to Hass Avocado Board research and promotion programs. A crucial factor for increasing processed avocado demand was the development and adoption of HPP for avocado products beginning in 1996.

High-Pressure Processing of Avocados Fueled Growth

Avocado processing has traditionally posed a number of food safety issues since unprocessed or minimally processed ready-to-eat (RTE) avocados have a relatively high risk of microbial contamination from pathogens such as Salmonella, E. Coli, and Listeria. Traditional approaches for assuring safe-to-eat avocado products used through the 1990s were accompanied by food quality and taste issues. Heat pasteurization tended to reduce avocado quality, while additives and preservatives produced flavor issues in the final product. Due to these limitations, processed avocados were regarded as clearly inferior to the fresh product in most menu applications.

The development and application of HPP for avocado products beginning in 1996 provided a solution for serious quality and taste problems. HPP is a cold pasteurization technique in which a product, already sealed in its final package, is introduced into a vessel and subjected to a high level of isostatic pressure transmitted by water to inactivate the bacteria, virus, yeasts, molds, and parasites that might be present, extending the product's shelf life and enhancing food safety. HPP also maintains the sensorial and nutritional properties of fresh avocados throughout their shelf life. Frozen HPP products can have a shelf life of up to two years.

The availability and growth of HPP processing capacity has been an important factor in the expansion of processed avocado sales, as is the convenience of having a dependable supply of high-quality inputs for food service menu items. Texas-based Fresherized Foods, which pioneered the use of HPP of avocados for production of guacamole to supply its restaurants, began commercialization of HPP slowly in 1996 and then ramped up as HPP technology and equipment improved. By 2008 Fresherized Foods was operating two processing facilities in Mexico,

one in Peru, and one in Chile. The largest Fresherized Foods plant, located in Mexico, had a capacity of nearly 1 million pounds of guacamole and fresh avocado pulp per week, using seven HPP machines and 1,400 employees.

Concluding Comments

The increased U.S. demand for processed avocados from 2016 through 2019 is impressive. This recent rate of growth is likely to pause, however, because of processed avocados' dependence on food service channels and institutional outlets that have been curtailed due to the coronavirus. First quarter 2020 processed avocado imports increased 10.6%, from 61.78 million pounds in 2019 to 68.53 million pounds, achieving an all-time high. Then, with coronavirus shutdowns, second quarter volumes decreased 13.9%, from 54.54 million pounds in 2019 to 46.97 million pounds in 2020. Processed avocado imports and consumption are unlikely to fully recover until the epidemic is controlled, when it is reasonable to expect growth to resume.

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For additional information, the author recommends:

Carman, H.F., T. Saitone, and R.J. Sexton. 2013. "Demand Growth and Commodity Promotions for Fresh Hass Avocados." *ARE Update* 17(1): 5–8. <https://bit.ly/3qjQwe1>.

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