

Are You Eating More Fruit? U.S. Dietary Recommendations and Fruit Consumption Trends

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U.S. consumers have responded to calls for improved diets by increasing per capita fresh fruit consumption from 88 pounds in 1980 to 116 pounds in 2020. Even with some decreases in processed fruit consumption, a typical consumer has increased the daily servings of fruit consumed from about 63% to about 68% of the recommended level. Fruit consumption adjustments for an average consumer over the last four decades include less fruit juices and canned fruit, a changing mix of citrus fruits, more berries, and significant increases in imported fruits such as avocados, bananas, limes, mangos, papayas, and pineapples.

Obesity and diet-related diseases are national problems that have government and non-governmental organizations working on solutions. Programs and policies to improve diets are a major thrust. Increased fruit consumption has been a goal of U.S. food and nutrition policy since federal dietary guidelines were first issued in 1980. Recent guidelines, updated every five years, recommend that an adult consuming 2,000 calories per day include approximately two cups of fruit per day in their diet. The discussion of dietary guidelines as recently as 2015 indicated that the typical American adult's diet consisted of about one cup of fruit, or only one-half of the recommended total.

The weight of fruit may vary, but one-third pound per cup is typically used for dietary calculations. In terms of dietary recommendations, one cup of fresh fruit, canned fruit, frozen fruit, or fruit juice are each equivalent to one-half cup of dried fruit. Overall,

indications were that only about 12% of Americans eat as much fruit daily as recommended.

While both per capita and total fruit consumption have been increasing over time, changes in per capita fruit consumption have varied significantly by product and product form since the initial issuance of federal dietary guidelines. This article examines changes and trends in per capita consumption of fresh and processed citrus and non-citrus fruit products since the advent of the federal dietary guidelines in 1980. Consumption of individual products and the role of imports are noted, as are some of the important underlying factors associated with aggregate consumption of fruit products.

The Data

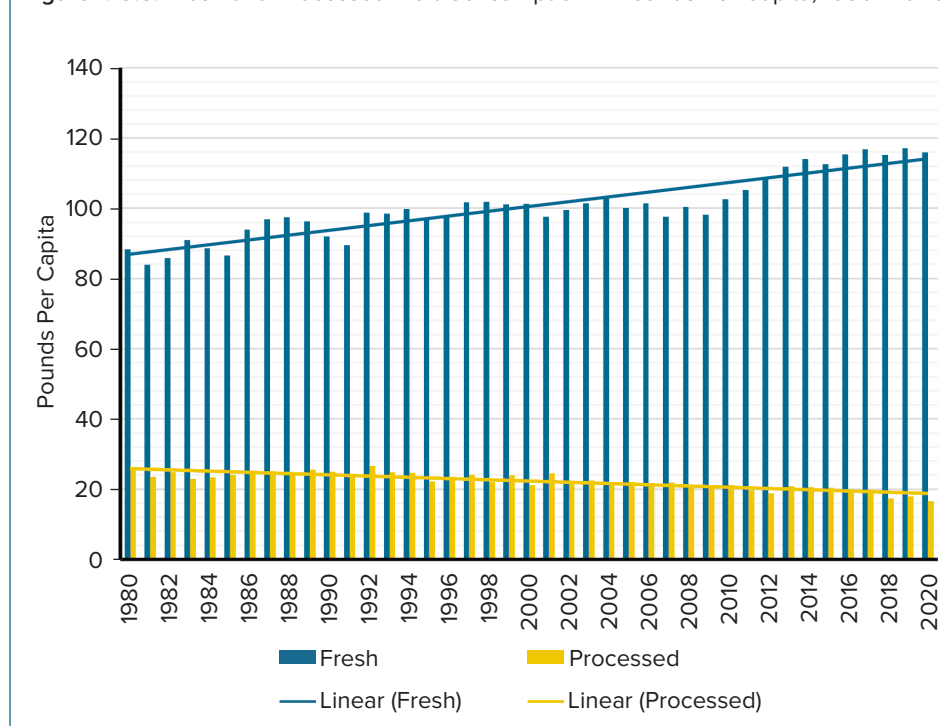
USDA Economic Research Service (ERS) publishes per capita consumption data in the Fruit Yearbook for 5

categories of citrus and 16 categories of non-citrus fruit, which are further enumerated by fresh, frozen, canned, dried, and juice products. The fresh and processed data are not strictly comparable; frozen, canned, and dried product categories are based on product weight (pounds per capita) rather than fresh equivalent and the juice products are in gallons per capita for each fruit juice. Citrus data however, do have an estimate of the fresh-weight equivalent for all processed citrus fruit by marketing year, and selected non-citrus fruits (apples, grapes, peaches, pears, pineapples, and strawberries) include an estimate of the total fresh weight equivalent.

Fruit Consumption Trends

Selected trends in per capita fruit consumption during the past 40 years are evident in Figure 1. Overall, per capita fruit consumption has increased as a result of increased fresh fruit

Figure 1. U.S. Fresh and Processed Fruit Consumption in Pounds Per Capita, 1980–2020



consumption, more than offsetting decreased per capita processed fruit consumption. Average 1980 fresh fruit consumption of 88.4 pounds increased to an average of 115.9 pounds per capita for 2020.

During the same time period, processed fruit (dried, frozen, and canned) decreased from 26.2 pounds to 16.5 pounds per capita and fresh fruit's share of total fruit consumption increased from 77% to 88%. Overall fruit consumption increased by 16% over the 41 years (from 114.6 to 132.5 pounds per capita).

Fruit juice consumption, reported as gallons rather than pounds per capita, is not shown in Figure 1. Total U.S. fruit juice consumption was 7.4 gallons per capita in 1980, peaked at 9.1 gallons per capita in 1997, and has steadily trended downward to 4.7 gallons per capita in 2020. During the 41-year period from 1980 through 2020, the citrus share of per capita fruit juice consumption decreased from over 75% to about 55%. Apple juice, the major non-citrus fruit juice accounted for 29% of total per capita fruit juice use in 2020.

To estimate the change in daily servings consumed over time, I convert reported per capita consumption data to annual servings using these conversion factors: three servings (cups) per pound of fresh, canned, or frozen fruit, six servings (1/2 cups) per pound of dried fruit, and 16 servings (cups) per gallon for fruit juice. U.S. fresh fruit consumption averaged 87.6 pounds per capita annually from 1980–1984. During this time, canned fruit averaged 18.7 pounds, frozen fruit averaged 2.8 pounds, and dried fruit averaged about 2.6 pounds per capita. The 5-year average for fruit juice consumption was 7.5 gallons per capita. Converting these amounts to one cup servings, the average U.S. consumer consumed 327 servings of fresh, canned, and frozen fruit, 16 servings

of dried fruit, and 120 servings of fruit juice, for a total of 463 cup-equivalent servings annually. This was 63% of the recommended 730 servings of fruit per year for an adult.

U.S. fresh fruit consumption averaged 116.0 pounds per capita annually from 2016–2020. During this time, canned fruit averaged 10.4 pounds, frozen fruit averaged 6.0 pounds, and dried fruit averaged about 2.3 pounds per capita. The recent 5-year average for fruit juices was 5.2 gallons per capita. Converting these amounts to one cup servings, the average U.S. consumer consumed 397 servings of fresh, canned, and frozen fruit, 14 servings of dried fruit, and 83 servings of fruit juice, for a total of 494 cup-equivalent servings annually. This was almost 68% of the recommended 730 servings of fruit per year for an adult.

Composition of Fresh Fruit Consumption

Almost three-quarters of total U.S. fruit consumption is in the fresh form. In 1980, U.S. fresh fruit consumption was dominated by five commodities that each had more than 5 pounds of per capita consumption: bananas (20.77 lb), apples (19.20 lb), oranges (14.28 lb), grapefruit (7.30 lb), and peaches and nectarines (7.08 lb). In 2020 eight fruit crops had more than 5 pounds of fresh per capita consumption: bananas (27.22 lb), apples (16.18 lb), oranges (9.37 lb), avocados (8.92 lb), grapes (8.20 lb), pineapples (7.30 lb), tangerines (6.63 lb), and strawberries (6.26 lb). Other fruits with increased consumption between 1980 and 2020 that did not meet the 5-pound-per-capita consumption cutoff in 2020 include lemons (4.95 lb), limes (4.27 lb), mangos (3.63 lb), blueberries (2.34 lb), papayas (1.25 lb), and kiwifruit (0.71 lb).

Several noteworthy developments in the growth of per capita fresh fruit consumption over the last four decades are shown in Table 1. First,

most of the growth occurred for non-citrus fruits; total citrus per capita use increased less than a pound from 1980 to 2020. For the citrus category, the decrease in orange consumption was largely offset by increased use of tangerines and the sharp decrease in fresh grapefruit consumption was exceeded by increased lemon and lime consumption, for an overall increase of 0.92 pounds for fresh citrus.

Second, in the non-citrus category, apples, bananas, and peaches and nectarines accounted for over 75% of the fresh fruit consumption in 1980; their share decreased to 51% in 2020, as their combined consumption decreased 1.65 pounds per capita (from 47.05 lb to 45.4 lb). Year-round availability of fresh fruit, enabled by integrated distribution networks, handling and packaging innovations, new varieties and production regions, and increased imports, helped increase the popularity and consumption of avocados, blueberries, grapes, kiwifruit, mangos, pineapples, papayas, and strawberries.

Finally, the increase in U.S. fresh fruit consumption would not have been possible without increased imports. The dramatic increase in imports' share of consumption for individual fruits increased the import share of all U.S. fresh fruit consumption from 26.7% in 1980 to 57.0% in 2020 (Table 1).

Processed Fruit Consumption

Per capita processed fruit consumption decreased both absolutely and as a share of total fruit consumption during the four decades from 1980–2020. The changes in per capita processed fruit consumption differed significantly by category and product, with frozen fruit increasing, dried fruit consumption remaining rather stable, and both per capita canned fruit and fruit juice consumption decreasing. The 1980 processed fruit consumption by category (cup equivalents) was

fruit juice (118.72), canned fruit (63.21), frozen fruit (8.55), and dried fruit (13.86), for a total of 204.34 cup-equivalent servings. The most recently recorded (2020) values for the consumption of processed fruit in terms of annual per capita servings (cup equivalents) was fruit juice (74.88), canned fruit (27.72), frozen fruit (18.72), and dried fruit (14.04) for a total of 135.36 cup-equivalent servings, a 33.8% decrease between 1980 and 2020.

Fruit Juice

Citrus accounts for the majority of all fruit juice consumption, but its share has decreased over time as orange and grapefruit juice consumption declined. Total per capita fruit juice consumption of 7.42 gallons in 1980 decreased to 4.68 gallons in 2020. In 2020, orange juice accounted for 48.7% (2.28 gallons), apple juice 29.5% (1.38 gallons), other citrus 6.2% (0.29 gallons), and other non-citrus 15.6% (0.73 gallons) of U.S. fruit juice consumption.

Canned Fruit

Over the past four decades per capita canned fruit consumption has persistently decreased, with 1980 consumption of 21.07 pounds per capita declining to 9.24 pounds per capita in 2020. Canned peaches (6.82 lb), pears (4.58 lb), apples (4.22 lb), and pineapples (3.48 lb) accounted for 90.7% of 1980 canned fruit consumption. Canned peach per capita consumption dropped 67.0% to 2.25 pounds in 2020, with drops for pears of 75.8% to 1.11 pounds, apples declining 22.3% to 3.28 pounds, and pineapples dropping 51.7% to 1.68 pounds.

Frozen Fruit

Per capita consumption of frozen fruits increased rather steadily from 2.85 pounds in 1980 to 4.57 pounds in 2020. Out of the 1.72 pounds per capita increase in frozen fruits, berries accounted for 1.54 pounds, or 90%, of the increase. Per capita shares in 2020 by frozen fruit were: strawberries

(40.5%), blueberries (19.0%), cherries (13.1%), raspberries (9.4%), peaches (8.5%), and other fruit (9.5%).

Dried Fruit

Per capita use of dried fruits remained steady over the period from 1980 (2.31 lb) through 2017 (2.34 lb). Per capita shares of dried fruit on a product-weight basis for 2017 were: raisins (53.0%), dates (18.4%), prunes (10.7%), and other fruits (17.9%). Note that the USDA stopped reporting raisin use beginning in 2018 because of a lack of shipment data.

U.S. Population

Total U.S. fruit consumption has responded to an increase in population as well as an increase in per capita consumption. The U.S. Census Bureau reported a total U.S. population of 227.726 million on July 1, 1980, growing to 330.114 million on July 1, 2020. The compounding effect of the two factors is easily illustrated using fresh fruit consumption. Per capita fresh fruit consumption was estimated at 88.34 pounds per capita in 1980, which, combined with population, yields total 1980 fresh fruit

Fresh Fruit	1980 Use	2020 Use	Import Percent	
	Pounds Per Capita	Pounds Per Capita	1980	2020
Oranges	14.28	9.37	0.7	14.3
Tangerines	2.10	6.63	9.0	39.5
Lemons	1.94	4.95	0.0	18.4
Limes	0.36	4.27	42.8	99.9
Grapefruit	7.30	1.68	0.4	6.1
Apples	19.20	16.18	4.0	4.5
Apricots	0.10	0.09	0.4	3.2
Avocados	2.08	8.92	0.4	90.8
Bananas	20.77	27.22	100.0	99.9
Blueberries	0.18	2.34	NA	62.4
Cherries	0.69	1.23	1.0	5.5
Cranberries	0.14	0.10	0.0	0.0
Grapes	3.97	8.20	13.6	54.6
Kiwifruit	0.07	0.71	NA	75.3
Mangos	0.25	3.63	75.8	99.9
Peaches and Nectarines	7.08	2.04	0.6	10.2
Pears	2.61	2.92	3.2	17.5
Pineapples	1.50	7.30	44.3	99.9
Papayas	0.21	1.25	3.4	99.1
Plums and Prunes	1.54	0.63	0.5	20.1
Strawberries	1.97	6.26	2.8	21.1
Total Citrus	25.98	26.90	1.8	34.3
Total Non-Citrus	62.36	89.02	37.1	63.9
All Fresh Fruit	88.34	115.92	26.7	57.0

Source: USDA, ERS. Fruit and Tree Nuts Yearbook Tables G-36 and H-1, Oct. 29, 2021.
Available at: <https://www.ers.usda.gov/data-products/fruit-and-tree-nuts-data/>.

consumption of 20.117 billion pounds. With population growth and fresh fruit consumption of 115.92 pounds per capita in 2020, estimated fresh fruit consumption totaled 38.267 billion pounds. Thus, total U.S. fresh fruit consumption increased 90.2% from 1980 to 2020.

Concluding Comments

A number of factors have contributed to the rise in U.S. per capita and total fruit consumption, consistent with national dietary recommendations issued in 1980. Even prior to the issuance of federal dietary guidelines, fruit industry and government programs focused on improving product characteristics, storage, processing, packaging, transportation, and marketing technology. Fruit quality improvements stemming from the adoption of technology such as controlled atmosphere storage and transportation; new fruit varieties selected for improved taste, ripening, maturity, shelf life, and seasonal availability; improved shipping containers; fruit processing innovations; and new packaging materials together with increased nutritional research and information have contributed to improved supply and increased fruit demand.

It is difficult to ascertain the role of dietary recommendations in several of the trends observed. For example, fruit juice consumption first increased to a high of 9.1 gallons per capita in 1997 and then decreased to 4.7 pounds in 2020. The competitive landscape for beverages, with the introduction of many new alternatives, has undoubtedly been a factor in decreased fruit juice consumption. Increased concerns about the role of both natural and added sugars in problems of obesity for some consumers may have also been a factor.

There has also been a rather steady decrease in the per capita use of fresh

grapefruit, peaches, nectarines, plums, and prunes. The underlying causes for the decreases have not been clearly identified, but there is evidence of shifts in both supply and demand. On the supply side, California acreage of non-citrus fruit crops, including stone fruits, has been trending down as acreage has been replaced by the expansion of almonds, pistachios, walnuts, and grapes. On the demand side, government-mandated promotion and research programs for peaches and nectarines were terminated, while existing programs for substitute products, such as blueberries, grapes, and strawberries, have been conducting health and nutrition research combined with very effective promotion and public relations programs.

Fruit imports have been critical for increased consumption in terms of both timing and amount. They enable year-round availability of fresh fruit and provide needed supply of some fruit that is not available domestically. Producer-funded health and nutrition research combined with effective promotion and public relations programs have also helped to increase the diversity of fresh fruit consumption. Examples are well-funded government-mandated marketing programs for avocados, blueberries, grapes, and strawberries.

Consumer preferences vary significantly between individuals and groups such that few consumers actually use the average per capita amounts of fruit reported. Research on patterns of product use has found that varying proportions of consumers do not use a product, and among those that do, a relatively small proportion will account for the majority of use. For example, the Hass Avocado Board (HAB) recently used fresh avocado shopper segments to describe avocado purchases. They reported that “Super” avocado shoppers represented only 25% of U.S. households but accounted

for 66% of all U.S. avocado purchases. HAB reported that the top 50% of buying households, sometimes referred to in the marketing literature as the “Heavy Half,” accounted for 87% of total avocado sales. While the concentration of purchases will vary by product, one can expect the Heavy Half to account for 65–90% of sales for most products.

U.S. consumers have responded to dietary recommendations to eat more fruit, with fresh fruit consumption increasing from 88.3 to 115.9 pounds per capita between 1980 and 2020. In the process, fresh fruit consumption has become much more diverse and imports now make up almost 60% of the fresh fruit supply. Much of the increased diversity is based on increased imports of avocados, bananas, kiwifruit, limes, mangos, papayas, and pineapples.

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USDA. “MyPlate” website: <https://www.myplate.gov/>.

Hass Avocado Board. 2022. “Ultra-Avocado Shoppers Make Significant Impact on Category.” Available at: <https://hassavocadoboard.com/2022/03/08/ultra-avocado-shoppers-make-significant-impact-on-category/>.