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# Characteristics of U.S. Orange Consumption

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## Abstract

U.S. per capita consumption of oranges has grown slowly since the 1960s, although the orange remains the number one fruit consumed (total fresh and processed uses). Consumption patterns appear to vary by demographic and economic characteristics. Northeast consumers show the strongest preference for orange juice, and those in the West for fresh oranges compared with consumers elsewhere. Consumers in the Midwest and the South consume less of all orange products. Hispanics and people of "other" races (including Asians) have the highest orange consumption of all racial/ethnic groups. Consumers classified as high-income favor orange juice, while those in the low-income group have the highest per capita consumption of orange drink. Males consume a greater share of all orange products than females.

**Keywords:** Orange, juice, drink, consumption, per capita use, distribution, regions, racial/ethnic background, income, age.

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## Oranges Are the Most Consumed Fruit in America

The orange is a favorite fruit among Americans. It has consistently ranked as the third most consumed fresh fruit behind bananas and apples. As a juice, it ranks number one. On average, Americans consume 2½ times more orange juice annually than its nearest competitor, apple juice.

Despite its continued popularity, consumption of fresh oranges has declined over the past several decades, giving way to other fruit and juices. According to the per capita disappearance data compiled by the U.S. Department of Agriculture's (USDA) Economic Research Service (ERS), fresh orange consumption declined 36 percent between 1959/60 and 2000/01 (table 1). Fresh consumption appears to have peaked in the 1950s and 1960s, when production was growing and consumers relied heavily on fresh products for most of their fruit consumption. In 1959/60, consumption averaged about 19 pounds per person annually. After declining in the 1970s through the early 1990s to about 12 pounds annually, fresh orange consumption now appears to be making a comeback. Americans are increasing their consumption of fresh oranges, along with other fresh fruit and vegetables, as a means to a healthy diet. Also, bigger crops in recent years have made fresh oranges more available and less expensive, further driving up demand. Along with bigger crops, increased imports of oranges and tangerines, especially

clementines, have increased supplies and alternatives available to consumers.

Orange juice has been a driving force behind increased orange consumption over the past half century, and is partially the reason behind the decline in consumption of fresh oranges. Consumers substitute orange juice for fresh orange consumption and receive many of the same benefits. The growing demand for orange juice over the past 50 years was spurred by its convenience over fresh use and its year-round availability. As juice consumption rose, the demand for oranges increased due to the greater quantity of fruit needed to make a single serving of orange juice versus eating one fresh orange. (On average, it takes 1 pound of oranges to make one 8-ounce glass of single-strength orange juice.) Processed orange production has grown about 2 percent per year since the 1960s.

Juice consumption took off in the mid-1940s with the introduction of frozen concentrated orange juice (FCOJ). Peak usage occurred in 1997/98 as a result of a record crop in Florida, where most of the juice is produced. The growing popularity of not-from-concentrate orange juice since the mid-1990s has helped maintain strong demand for orange juice as the popularity of FCOJ has declined.

**Table 1—U.S. per capita consumption, oranges and tangerines, select years**

Year	Fresh market		Juice		Total	
	Oranges	Tangerines	Oranges	Tangerines	Oranges	Tangerines
<i>—Pounds, fresh weight equivalent—</i>						
1959/60	19.3	1.1	67.5	0.2	86.8	1.3
1964/65	16.4	1.3	50.2	0.2	66.6	1.5
1969/70	16.2	2.2	67.4	1.2	83.6	3.4
1974/75	15.9	2.6	78.3	1.6	94.2	4.2
1979/80	14.3	2.2	81.0	2.9	95.3	5.1
1984/85	11.6	1.5	78.4	1.4	90.0	2.9
1989/90	12.4	1.3	72.0	1.1	84.3	2.4
1994/95	11.8	2.0	69.5	1.3	81.3	3.2
1995/96	12.6	2.2	77.5	1.2	90.1	3.4
1996/97	13.9	2.5	74.1	2.0	88.0	4.5
1997/98	14.6	2.2	81.9	1.5	96.5	3.6
1998/99	9.4	2.2	76.6	1.2	85.0	3.4
1999/00	11.7	2.8	71.4	1.6	83.1	4.5
2000/01	12.3	2.6	74.1	1.2	86.4	3.9

Source: Economic Research Service, USDA.

Per capita consumption of oranges has grown slowly since the 1960s. Occasional declines in consumption are usually associated with weather-reduced crops. Oranges have often been associated with their beneficial health attributes, especially as a source of vitamin C. More recently, the fruit has also gained publicity because it contains folic acid, an important nutrient for pregnant woman to help prevent birth defects. The orange juice industry has used the endorsements of the American Cancer Society, the American Heart Association, and the March of Dimes to help promote its product.

While the ERS disappearance data have for many years provided estimates of per capita use of oranges,

those data cannot answer questions such as who consumes oranges, how much they consume, and in what product form. With the use of the Continuing Survey of Food Intakes by Individuals (CSFII)<sup>1</sup> data, consumption patterns and information about market distribution of fresh and processed oranges can be obtained. Following a discussion of the data, the next sections will describe the distribution of fresh and processed oranges by food source, region of the country, ethnic background, income class, and age and sex.

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<sup>1</sup>U.S. Department of Agriculture, Agricultural Research Service, 2000. Continuing Survey of Food Intakes by Individuals 1994-96 and 1998. CD-ROM.

## Data and Methodology

ERS has estimated the disappearance of individual types of fruit for a long time, with data series available in the *Fruit and Tree Nuts Yearbook* going back to the 1970s. The data provide an approximate level of annual per capita consumption. Per capita consumption is calculated by aggregating utilized production and imports and subtracting out exports. What remains is considered to be domestic consumption. That data can then be expressed on a per capita basis by dividing by the U.S. population. With this method, we are able to get an idea of trends in consumption, and an estimate of how much of a specific fruit a person consumes on average. This data, however, cannot tell us anything about the demographics of consumption, who consumes most of the commodity, and where it is being consumed.

Recently, ERS began using survey data from the 1994-96 and 1998 Continuing Survey of Food Intakes by Individuals (CSFII), conducted by USDA's Agricultural Research Service (ARS) to get at such demographic and economic information. This article uses the CSFII data to show consumption by location, race, age, and place of consumption for fresh and processed oranges and tangerines as well as for different orange and tangerine products—fresh, juice, drink, and other processed products. Juice contains 100 percent juice (may be blended with other juices), while drink contains 10 percent or less juice. "Other" is a catch-all category that includes canned and frozen sections, sorbets, frozen fruit bars, sherbets, jellies and jams, baby foods, candies, peel, and flavorings.

By using the disappearance data along with the CSFII, per capita consumption in pounds can be estimated for fresh and juice.<sup>2</sup> A lack of disappearance data for

drink and other orange products does not allow us to calculate separate consumption data for these products.

For simplicity, the term orange will be used to include both orange and tangerine consumption. Tangerine consumption is very small relative to orange and the data mostly reflect orange use. Data referring to per capita consumption in pounds refers only to oranges.

USDA has conducted periodic surveys of household and individual food consumption in the United States since the 1930s (see box, p. 5). The most recent surveys, the 1994-96 and 1998 CSFII, provide the basis for this article. Each year, the 1994-96 data set comprises a nationally representative sample of non-institutionalized persons residing in 50 States and Washington, DC. The 1998 CSFII was a supplemental survey to the 1994-96 CSFII. The supplemental survey focused entirely on children (see the box for more detail).

In the CSFII, two nonconsecutive days of dietary data for individuals of all ages were collected 3 to 10 days apart through in-person interviews using 24-hour recalls. The 1994-96 CSFII data set includes information on the food and nutrient intakes of 15,303 individuals, while the 1998 CSFII data set includes 5,559 children up to 9 years of age.

The respondents provided a list of food consumed as well as information on where, when, and how much of each food was eaten. Standardized probes were used to collect details on food descriptions and amounts of food eaten. The location where the food was purchased was coded into several categories. For each respondent, economic, social, and demographic characteristics were also collected.

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<sup>2</sup>The term "juice" includes all processed orange products. Juice accounts for 99 percent of all the processed products.

## USDA Food Consumption Data

USDA collects and compiles two major data sets on food consumption in the United States, the Supply and Utilization or food disappearance data, compiled by the Economic Research Service, and the Continuing Survey of Food Intakes by Individuals, compiled by the Agricultural Research Service. Both data sets are key components of ongoing Federal efforts to monitor the nutritional health and dietary status of the U.S. population. They were mandated by Congress under the National Nutrition Monitoring and Related Research Act of 1990. When used together, they provide a comprehensive picture of the Nation's eating habits.

Food Supply and Utilization Data, also known as food disappearance data, measure the flow of raw and semi-processed food commodities through the U.S. marketing system. They are a direct measure of neither actual consumption nor of the quantity of food actually ingested. The total amount available for domestic consumption is estimated as the residual after exports and year-end inventories are subtracted from the sum of production, beginning inventories, and imports. The use of conversion factors allows for some subsequent processing, trimming, spoilage, and shrinkage in the distribution system. However, the estimates also include residual uses for which data are not available (such as miscellaneous non-food uses and changes in retail and consumer stocks).

With data back to the early- to mid-1900s for most commodities, the food disappearance data are useful as indicators of trends over time. The data are most commonly used to measure the average level of food consumption in the country, to show year-to-year changes in consumption of major foods, to calculate the approximate nutrient content of the food supply, to establish long-term consumption trends, and to permit statistical analyses of effects of prices and income on food consumption. Because they include spoilage and waste accumulated through the marketing system and in the home, the data typically overstate actual consumption. A 1997 ERS study suggests that such losses may exceed 25 percent of the edible food supply.

Food disappearance data reflect the amount of major food commodities entering the market, regardless of their final use. Final product forms and consumption locations are not usually known, and little or no data exist on supplies of further processed products. In short, relatively good information exists for many food ingredients, but not for foods as actually eaten. For example, the food disappearance data provide an estimate of the annual per capita consumption of processed oranges but provide little information on consumption by product form (slices, canned); where the prod-

ucts were marketed (supermarket, school, restaurant, food manufacturer); how they were consumed (in frozen desserts, in salads); how they were prepared (canned or part of another frozen product); or the socioeconomic characteristics of the consumer who ultimately ate the food.

Survey data used in this paper are taken from USDA's Continuing Survey of Food Intakes by Individuals (CSFII), 1994-96 and 1998. The 1998 CSFII is a child-oriented survey, supplemental to the 1994-96 CSFII, which is a national representative sample. The 1998 CSFII adds intake data from 5,559 children birth through age 9 years to the intake data collected in 1994-96. The CSFII measures foods actually eaten by individuals. The survey records food intake over a specific period of time (two non-consecutive days in 1994-96 using 24-hour dietary recalls). The survey collects demographic information, such as household size, income, race, age, and sex, and information on where a food was purchased, how it was prepared, and where it was eaten, in addition to food-intake data. The CSFII provides information for use in policy formation, regulation, program planning and evaluation, education, and research. For example, data from recent surveys have been used to evaluate the impact of food fortification on nutrient intakes, to estimate exposure to pesticide residues and other contaminants from foods, and to target nutrition assistance and education programs to those who need them most. The data are particularly valuable for measuring the effect of socioeconomic and demographic characteristics on food consumption.

In this study, we also make use of the Food Commodity Intake Database (FCID) from the Environmental Protection Agency. FCID contains human food consumption data expressed in terms of agricultural food commodities on 5,831 different foods and beverages people of different ages reported eating in 1994-96 and 1998. FCID provides the edible amount of agricultural food commodities contained in each food reported eaten in CSFII, so that we can convert food in CSFII into agricultural commodities that we report as the different categories: fresh, juice, drink, and other processed products.

The 1994-96 CSFII data include a sample weight for each respondent, indicating the number of people the sample represents. The share of an orange product by location, for example, can be estimated by calculating the weighted-sum of the product consumed in each location. Similarly, the socioeconomic and demographic characteristics of the respondents can be used to estimate the consumption share of oranges by these characteristics.

## Orange Use and Markets

Total orange consumption in 2000/01 was 86.4 pounds per capita, 10 percent below the record high of 96.5 pounds set in 1997/98 (table 1). The 2000/01 consumption translates into 12.3 pounds of fresh and 5.19 gallons of juice, which is equivalent to 74.1 pounds of oranges, fresh equivalent. Total per capita tangerine consumption was 3.9 pounds in 2000/01, 2.6 pounds were consumed fresh and 1.2 pounds, fresh equivalent, of processed tangerine products. On any given day (with oranges and tangerines together), 5 percent of Americans will consume a fresh orange, 21 percent will consume orange juice, 8 percent orange drink, and 2 percent other orange products.

Valued at \$1.7 billion in 2000 and accounting for 16 percent of fruit and tree nut cash receipts, U.S. orange production is second in value only to grapes. The United States is the world's second-largest orange producer after Brazil. Together, the two countries account for over half of world production. The United States produces only about 60 percent of the quantity pro-

duced in Brazil. U.S. production has grown rapidly over the past decade, increasing 49 percent between 1990/91 and 2000/01.

Processing accounts for about 80 percent of orange use, with fresh use accounting for the remainder. Most processed oranges go to making juice. Florida accounted for almost 80 percent of orange production in 2000/01 and is the dominant orange-processing State. In 2000/01, 74 percent of Florida's processing crop went to making frozen concentrated orange juice, 22 percent to chilled juice (mostly not-from-concentrate), and 3 percent to other processed products such as sections and salads, canned juice, and blend. Byproducts of juice making can also be used for human consumption, such as essences from the skin used for flavoring. The remainder of the processed orange is usually made into feed pellets for livestock.

## Market Share by Location

In our analysis, the "at home" and "away from home" delineation is based on where a food was obtained or prepared, not where it was consumed. Food at home is generally obtained at a retail store such as a supermarket, grocery store, or convenience store. Food away from home is generally purchased from a foodservice establishment, but can also be obtained in such places as school cafeterias, community feeding programs, and child/adult care centers.

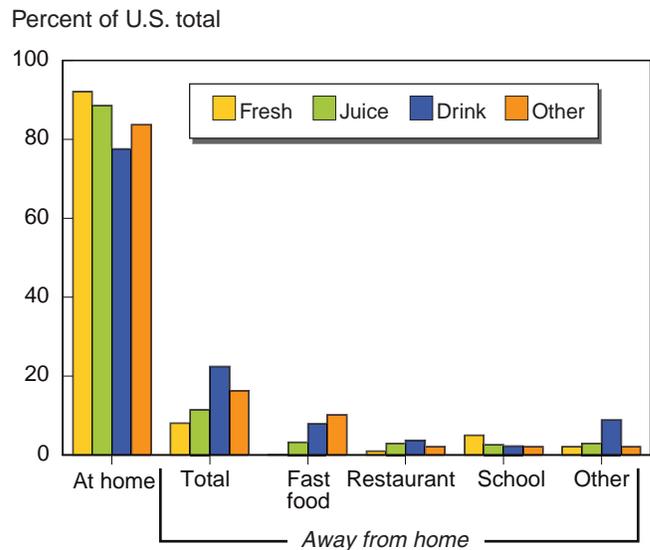
Both home and away-from-home food can be consumed at home or away from home. For example, a bagged lunch prepared at home and consumed at school or work is classified as at-home food. An orange juice purchased at a fast-food restaurant and consumed at home is classified as food away from home.

Fast-food places include self-service establishments and carryout places; restaurants are places that have wait staff; and school cafeterias include daycare facilities and summer camps. The survey indicated that on any given day, 98 percent of the population ate at least one food at home, and 55 percent of the population ate at least one food away from home, with 31 percent visiting fast-food establishments (table 2). The "other" category is a catchall, including such places as community feeding centers, bars and taverns, vending machines, etc. The totals may exceed 100 percent because many consumers eat at home as well as away from home on any given day.

According to the CSFII survey, between 78 and 92 percent of fresh and processed orange products are consumed at home, having been purchased at retail stores (fig. 1). Fresh oranges and orange juice are the most likely to be consumed at home. Each American consumes an average of 13.6 pounds of fresh oranges per year at home (table 3). At-home orange juice consumption accounts for about 64.1 pounds of oranges per person per year, fresh-weight equivalent. Orange juice is mostly perceived as a breakfast item and home is still the most popular place to eat breakfast.

Fast-food establishments are the second most popular place to purchase other orange products after the retail level. Orange sections are popular items in salad bars

Figure 1  
**Orange consumption by eating location**



and in some prepared salads offered by some fast-food places. The availability of orange sections at these establishments increases the likelihood that consumers will eat them. Consumers are more likely to consume the orange sections that are already present in a salad or salad bar than to purchase a whole orange at a fast-food establishment or restaurant and have to peel it. About 2 percent of "other" orange products are consumed in sit-down restaurants and at school.

Schools are the most popular place away from home to eat fresh oranges. About 5 percent of fresh oranges are purchased at school, more than half of the fresh oranges consumed away from home (orange products brought from home but consumed at school would be classified as consumed at home). About 40 percent of the orange juice consumed away from home is purchased at fast-food establishments, likely as part of breakfast. Orange drink consumption away from home occurred mostly at other establishments, such as vending machines, followed by fast-food places.

**Table 2—Distribution of U.S. consumption of fresh and processed oranges and tangerines<sup>1</sup>**

	Population	All orange products	Fresh	Juice	Drink	Other processed products <sup>2</sup>
	<i>Percent</i>					
<b>Food sources:</b>						
Home	97.6 <sup>3</sup>	88.5	92.0	88.5	77.5	83.7
Away from home	54.8 <sup>3</sup>	11.5	8.0	11.5	22.5	16.3
Fast food	30.8 <sup>3</sup>	3.1	0.1	3.2	7.8	10.2
Restaurant	17.3 <sup>3</sup>	2.7	0.9	2.8	3.6	2.1
School	6.7 <sup>3</sup>	2.7	4.9	2.5	2.2	2.0
Other	12.9 <sup>3</sup>	3.0	2.1	2.9	8.9	2.0
<b>Census region:</b>						
Northeast	19.6	26.4	21.2	27.1	18.5	14.1
Midwest	23.5	21.8	19.8	21.7	29.7	34.5
South	34.9	30.7	22.7	31.5	27.7	29.7
West	22.0	21.2	36.2	19.8	24.1	21.7
<b>MSA status: <sup>4</sup></b>						
Urban	32.0	36.5	34.5	36.7	38.4	26.2
Suburban	46.9	45.8	49.0	45.7	39.9	62.2
Rural	21.1	17.7	16.5	17.7	21.7	11.5
<b>Race/ethnic origin:</b>						
White, non-Hispanic	72.6	67.3	61.7	68.1	56.9	82.7
Black, non-Hispanic	12.5	14.3	9.6	14.5	23.0	11.9
Hispanic	10.5	13.0	19.2	12.3	16.6	3.6
Others	4.4	5.4	9.6	5.1	3.5	1.9
<b>Household income as a percentage of poverty:</b>						
0-130 percent	19.0	18.9	19.7	18.7	22.4	13.5
131-350 percent	42.0	39.7	40.5	39.5	43.4	38.5
Greater than 350 percent	39.0	41.5	39.8	41.8	34.1	48.0
<b>Sex and age:</b>						
<b>Males, all</b>						
Males, all	48.9	52.9	49.2	53.1	57.3	42.5
Males, under 2	1.6	1.6	1.6	1.6	1.7	2.8
Males, 2-11	7.4	7.3	6.9	7.1	11.2	17.8
Males, 12-19	5.9	8.0	4.7	8.2	12.0	5.1
Males, 20-39	16.0	18.3	16.0	18.6	18.1	3.6
Males, 40-59	11.6	11.0	11.2	11.0	11.1	11.2
Males, 60 and over	6.7	6.7	8.8	6.7	3.2	2.1
<b>Females, all</b>						
Females, all	51.1	47.1	50.8	46.9	42.7	57.5
Females, under 2	1.5	1.3	1.2	1.3	1.8	1.7
Females, 2-11	7.0	6.5	8.2	6.3	8.5	16.9
Females, 12-19	5.7	6.3	3.1	6.6	7.0	9.0
Females, 20-39	15.9	14.1	11.3	14.3	15.5	16.1
Females, 40-59	12.1	10.3	13.5	10.2	5.3	6.9
Females, 60 and over	8.6	8.6	13.6	8.3	4.6	6.9

<sup>1</sup>Components may not add vertically due to rounding.<sup>2</sup>Includes products such as ice cream, canned and frozen sections, jellies and jams, and baby food.<sup>3</sup>Percent of population consuming at least one food at the specific location on any given day.<sup>4</sup>MSA = Metropolitan Statistical Area.

Source: U.S. Department of Agriculture, Agricultural Research Service, 2000. Continuing Survey of Food Intakes by Individuals, 1994-96 and 1998. CD-ROM

**Table 3—Per capita orange consumption, at home/away from home, 2001**

Category	Total <sup>1</sup>	Fresh	Juice <sup>2</sup>
		<i>Pounds per person</i>	
At home	77.13	13.57	64.11
Away from home	10.02	1.17	8.31
Fast food	2.69	0.02	2.32
Other restaurant	2.34	0.13	2.04
School	2.36	0.72	1.84
All others	2.63	0.31	2.11
All sources	87.16	14.74	72.42

<sup>1</sup> Fresh and processed may not sum to total due to weighting and rounding of components.

<sup>2</sup> Includes all processed products, with juice accounting for about 99 percent of the total.

Source: Derived by ERS using data from the 1994-96 and 1998 Continuing Survey of Food Intakes by Individuals. U.S. Dept. of Agriculture, Agricultural Research Service, 2000, and ERS supply and utilization calculations.

## Orange Use by Region and Urbanization

Regional preferences appear to play a strong role in what form oranges are consumed. The Northeast had the strongest preference for orange products in the aggregate, with per capita orange consumption averaging 117.27 pounds per year, a third higher than the national average of 87.16 pounds (table 4). The Northeast showed the strongest preference for orange juice, with the share consumed in the region exceeding the share of the population for that region (fig. 2). The West showed the strongest preference for fresh oranges compared with consumers elsewhere. Orange

**Table 4—Regional per capita consumption of oranges, 2001**

Region	Total <sup>1</sup>	Fresh	Juice <sup>2</sup>
<i>Pounds per person</i>			
Northeast	117.27	15.97	100.21
Midwest	80.75	12.44	66.75
South	76.55	9.60	65.28
West	89.30	24.25	65.05
Total	87.16	14.74	72.42

<sup>1</sup>Fresh and processed may not sum to total due to weighting and rounding of components.

<sup>2</sup>Includes all processed products, with juice accounting for about 99 percent of the total.

Source: Derived by ERS using data from the 1994-96 and 1998 Continuing Survey of Food Intakes by Individuals. U.S. Dept. of Agriculture, Agricultural Research Service, 2000, and ERS supply and utilization calculations.

juice, mostly made from Florida oranges, is sold to a large extent where incomes and populations are traditionally high, historically to the Northeast. Fresh-market oranges are mostly produced in the West, allowing for plentiful, inexpensive supplies available for local consumers. Consumers in the Midwest and the South consumed the smallest quantities of orange products. This finding is interesting because of the plentiful supply of fresh oranges in the South, not only in Florida but also in smaller quantities in other Gulf Coast States. While people in the West consumed about 24 pounds of fresh oranges per person per year, and people in the Northeast consumed another 16 pounds per person per year, people in the South consumed only about 10 pounds per person.

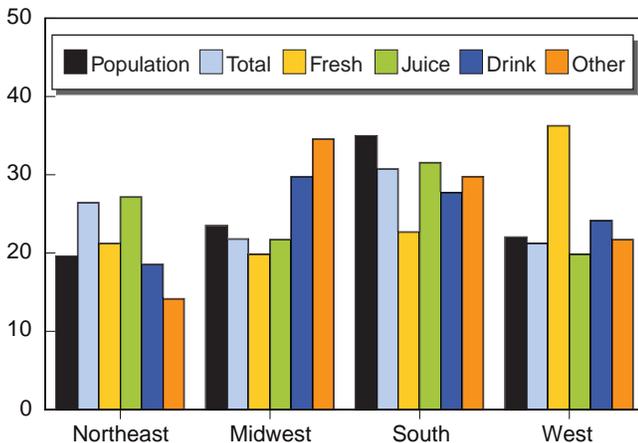
Orange drink consumption was heaviest in the Midwest where the share of use exceeded the population size. This indicates that people in the Midwest consumed more orange drink than in any other region. People in the West were the second biggest orange drink consumers.

Urban areas (the central city) accounted for about a third of the U.S. population and they also accounted for a like amount of orange consumption (fig. 3). On average, an urbanite consumed 99.5 pounds of oranges annually, about 14 percent more than the U.S. population in general (table 5). Urban per capita consumption

Figure 2

### The share of population and orange consumption by region

Percent of U.S. total

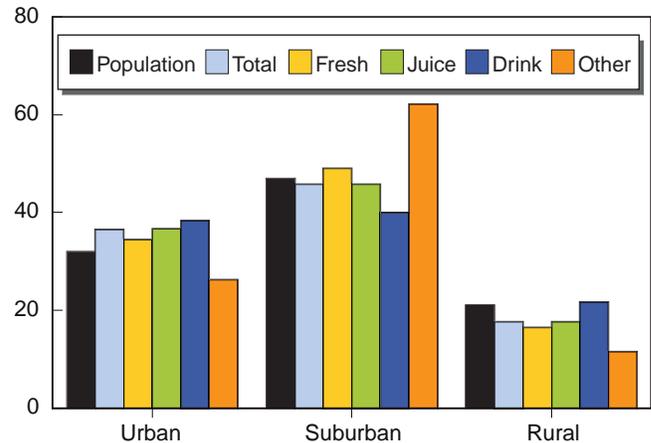


Source: Economic Research Service, USDA.

Figure 3

### The share of population and orange consumption by urban/rural location

Percent of U.S. total



Source: Economic Research Service, USDA.

**Table 5—Urban/rural per capita consumption of oranges, 2001**

Metro status	Total <sup>1</sup>	Fresh	Juice <sup>2</sup>
	<i>Pounds per person</i>		
Urban	99.50	15.87	83.01
Suburban	85.12	15.40	70.51
Rural	72.99	11.54	60.61
Total	87.16	14.74	72.42

<sup>1</sup>Fresh and processed may not sum to total due to weighting and rounding of components.

<sup>2</sup>Includes all processed products, with juice accounting for about 99 percent of the total.

Source: Derived by ERS using data from the 1994-96 and 1998 Continuing Survey of Food Intakes by Individuals. U.S. Dept. of Agriculture, Agricultural Research Service, 2000, and ERS supply and utilization calculations.

of both fresh oranges and juice exceeded the averages of suburban and rural areas.

Suburban areas (outside the central city) accounted for the biggest share of orange product usage due to their greater share of the U.S. population. While suburban areas' fresh use exceeded the national average, orange juice consumption averaged only 70.51 pounds per person annually, about 97 percent of the national average of 72.42 pounds.

Rural areas have fewer people than urban and suburban areas, and their per capita consumption of orange products was the lowest. Rural residents had the lowest consumption of both fresh oranges and juice, 11.54 pounds of fresh oranges and 60.61 pounds of juice. On average, people living in rural areas consumed 72.99 pounds of orange products annually, about 84 percent of the national average.

## Racial/ethnic Makeup of Orange Consumers

Hispanics and people of “other” races (including Asians) have the highest orange consumption of all racial/ethnic groups. On average, individuals in the “other” race group consumed an average of 116.56 pounds fresh and processed oranges annually and Hispanics consumed 111.72 pounds of fresh and processed oranges per person annually (table 6). In comparison, non-Hispanic blacks consumed an average of 95.07 pounds annually and whites consumed only 80.47 pounds annually. On any given day, 38 percent of Hispanics and blacks, 36 percent of “others,” and 30 percent of whites consumed an orange product.

Hispanics, “other” racial/ethnic groups, and blacks consumed about a quarter more orange juice than whites. On average, Hispanics consumed an equivalent of 84.84 pounds per person per year of oranges in the form of juice. Their consumption was almost the same as for those in the “other” racial/ethnic group, who averaged 84.44 pound per person and just slightly higher than for blacks who averaged 83.78 pounds per person per year. Whites, however, lagged behind all other racial/ethnic categories, consuming an average of 67.94 pounds per year.

**Table 6—Per capita consumption of oranges by race/ethnicity, 2001**

Category	Total	Fresh <sup>1</sup>	Juice <sup>2</sup>
<i>Pounds per person</i>			
White	80.47	12.52	67.94
Black	95.07	11.30	83.78
Hispanic	111.72	26.88	84.84
Other	116.56	32.13	84.44
Total	87.16	14.74	72.42

<sup>1</sup>Fresh and processed may not sum to total due to weighting and rounding of components.

<sup>2</sup>Includes all processed products, with juice accounting for about 99 percent of the total.

Source: Derived by ERS using data from the 1994-96 and 1998 Continuing Survey of Food Intakes by Individuals. U.S. Dept. of Agriculture, Agricultural Research Service, 2000, and ERS supply and utilization calculations.

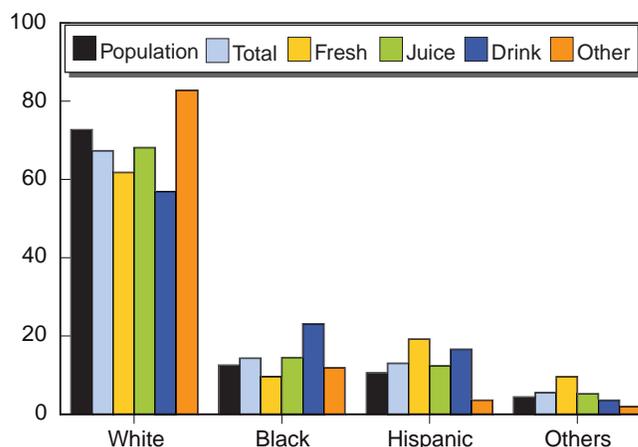
People in the “other” racial/ethnic category were the biggest consumers of fresh oranges. On average, they consumed 32.13 pounds of oranges per person per year, over 2½ times more than whites and almost 3 times more than blacks. Hispanics consumed 26.88 pounds of fresh oranges per person per year. While Hispanic consumption was less than “others,” they still consumed more than the national average of 14.74 pounds per person.

Although whites, as a whole, consumed the biggest proportion of orange drink, blacks drank more on a per capita basis than any racial/ethnic group (fig. 4). Hispanics are also big drink consumers, relative to their population size. Orange-flavored drinks and soda are popular in many Latin American countries and immigrants are likely to seek out these products after settling in the United States. While the quantity of drink consumption cannot be calculated with the available data, we do know that on a given day, 12 percent of Hispanics consume orange drink and 21 percent consume juice. (These categories are not mutually exclusive, a person may consume both on a single day.) For blacks, 15 percent consume orange drink on any one day and 23 percent consume juice. The gap between orange drink and juice is wider for both whites and “others.” These data indicate that whites and “others” consumed more servings of orange juice than of orange drink.

Figure 4

### The share of population and orange consumption by racial/ethnic group

Percent of U.S. total



Source: Economic Research Service, USDA.

## Orange Use and Income

In the CSFII survey, households were classified into three income groups using the Federal poverty guidelines. As a matter of reference, the Census Bureau reported that the weighted-average poverty income threshold for a 4-person household was \$15,961 during 1994-98 (derived from the *Statistical Abstract of the United States, 2000*). The poverty guideline was developed by the U.S. Department of Health and Human Services to implement the Federal food programs. Some Federal food programs, such as the Food Stamp Program, use 130 percent of the poverty level to determine eligibility for participation and, in this article, that percentage is used as the top end of the low-income category. About 19 percent of the households fell into this low-income category (up to 130 percent of the poverty level). Another 42 percent fell into the middle-income category of between 130 and 350 percent of the poverty level, and 39 percent of the households were high income, with incomes exceeding 350 percent of the poverty level.

There are some distinct preferences for orange products by income. Orange juice and "other" orange products are clearly favored by the high-income group, which has the highest per capita consumption as well as market shares for these products (table 7 and fig. 5).

**Table 7—Per capita consumption of oranges by income class, 2001**

Percent of poverty level	Total <sup>1</sup>	Fresh	Juice <sup>2</sup>
<i>Pounds per person</i>			
Under 130 percent	86.52	15.13	70.46
131 to 350 percent	82.37	14.26	68.44
Over 350 percent	92.64	15.05	77.66
All households	87.16	14.74	72.42

<sup>1</sup>Fresh and processed may not sum to total due to weighting and rounding of components.

<sup>2</sup>Includes all processed products, with juice accounting for about 99 percent of the total.

Source: Derived by ERS using data from the 1994-96 and 1998 Continuing Survey of Food Intakes by Individuals. U.S. Dept. of Agriculture, Agricultural Research Service, 2000, and ERS supply and utilization calculations.

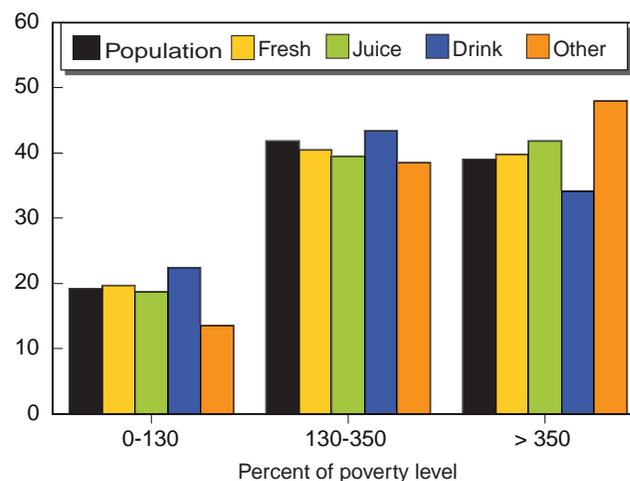
Orange drink per capita consumption, on the other hand, is inversely related to income, with the low-income group having the biggest share of consumption on a per person basis (the share of drink consumed by those in the low-income group exceeds the share of the population in that group). However, per capita consumption of fresh oranges does not vary greatly among the three income groups. The middle-income group has the largest share of fresh orange and orange drink markets due to its large population base.

Per capita consumption of fresh oranges and orange juice by the low-income group is likely increased through USDA's nutrition programs. USDA's Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is designed to improve the health of low-income (less than 186 percent of the poverty level) nutritionally at-risk infants, children, and pregnant, postpartum, and breast-feeding women. The WIC program provides food packages for children 1 to 5 years old, and the packages include fruit and vegetable juice. WIC has been shown to contribute to higher consumption of vitamin C among low-income children, likely through the increased consumption of orange juice.

Figure 5

### The share of population and orange consumption by income level

Percent of U.S. total



Source: Economic Research Service, USDA.

## Consumption of Orange Products by Sex and Age

Males consume a greater share of all orange products than females (figs. 6 and 7). While males make up 49 percent of the population, they account for about 53 percent of total orange consumption. Females account for 51 percent of the total population and account for 47 percent of total consumption. On any given day, however, the portion of the general population consuming each orange product does not differ greatly by sex.

Among males, those in the 20- to 39-year group accounted for the biggest proportion of the population and accounted for the biggest share of fresh, juice, and drink consumption. On a per capita basis, however, they consumed an average of 98.72 pounds (fresh-weight equivalent) of oranges annually, less than males in the 12- to 19-year group (table 8). Much of that consumption came from orange juice, of which they consumed an annual average of 83.96 pounds. Males in the 12- to 19-year age group averaged 112.08

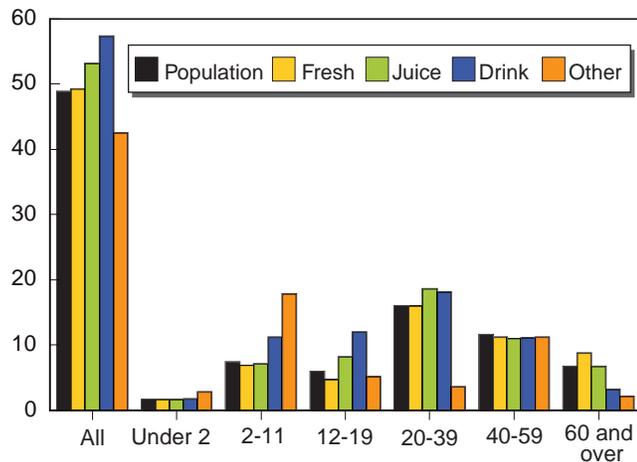
pounds of orange consumption annually, with 100.41 pounds in the form of orange juice. On average, males consumed 93.5 pounds per capita of oranges per year. Males 60 and over had the heaviest fresh orange consumption, averaging 19.29 pounds a year, much higher than the average for all males at 14.82 pounds.

Female orange consumption generally mirrored that of males, but at lower quantities. The group of females with the greatest consumption of oranges, however, was those 60 and over. They averaged 92.75 pounds of oranges per capita annually, with a higher usage of fresh oranges than any other age group. This group of women ate more fresh oranges, averaging 23.28 pounds annually, than any other age group, female or male. Females in the 12- to 19-year group were the second leading consumers of orange products, averaging 91.87 pounds per capita annually. Most of their consumption was from juice.

Figure 6

### The share of population and orange consumption for males, by age

Percent of U.S. total

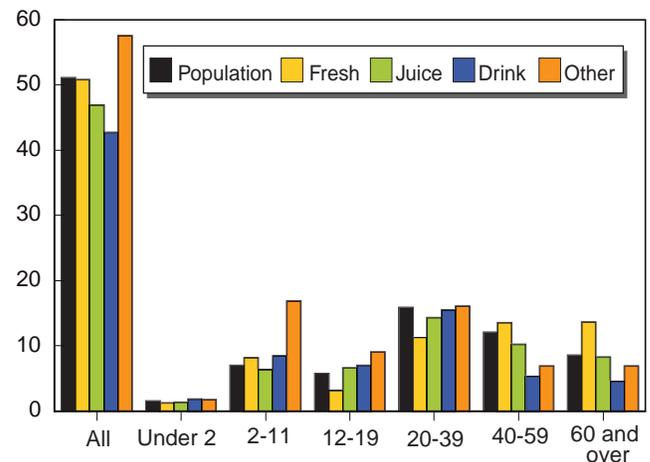


Source: Economic Research Service, USDA.

Figure 7

### The share of population and orange consumption for females, by age

Percent of U.S. total



Source: Economic Research Service, USDA.

**Table 8—Per capita consumption of oranges, by age/sex, 2001**

Age/sex	Total <sup>1</sup>	Fresh	Juice <sup>2</sup>
		<i>Pounds per person</i>	
Male, all	93.50	14.82	78.69
Male, under 2	86.25	14.28	71.97
Male, 2-11	83.70	13.82	69.88
Male, 12-19	112.08	11.67	100.41
Male, 20-39	98.72	14.76	83.96
Male, 40-59	83.00	14.26	68.74
Male, 60 and over	91.28	19.29	71.99
Female, all	81.09	14.67	66.43
Female, under 2	74.75	11.99	62.77
Female, 2-11	82.12	17.35	64.77
Female, 12-19	91.87	7.89	83.98
Female, 20-39	75.47	10.43	65.04
Female, 40-59	77.26	16.45	60.81
Female, 60 and over	92.75	23.28	69.47
Total	87.16	14.74	72.42
Total, under 2	80.69	13.17	67.52
Total, 2-11	82.93	15.54	67.39
Total, 12-19	102.15	9.81	92.34
Total, 20-39	87.13	12.60	74.53
Total, 40-59	80.07	15.37	64.69
Total, 60 and over	92.11	21.53	70.58

<sup>1</sup>Fresh and processed may not sum to total due to weighting and rounding of components.

<sup>2</sup>Includes all processed products, with juice accounting for about 99 percent of the total.

Source: Derived by ERS using data from the 1994-96 and 1998 Continuing Survey of Food Intakes by Individuals. U.S. Dept. of Agriculture, Agricultural Research Service, 2000, and ERS supply and utilization calculations.

## Conclusions

The disappearance data produced by ERS show that oranges are one of the most popular fruit consumed in the United States. Fresh oranges are among the top five fresh fruits Americans eat, and orange juice is the number one juice. Demand for fresh oranges remains steady and orange juice demand remains strong, although it has fallen since its peak demand in 1997/98.

This article goes one step further than the usual analysis of consumption. By using the CSFII database, the proportion of total consumption of fresh oranges, orange juice, orange drink, and other orange products can be determined by demographic and economic groups. Where these products are consumed can also be determined using this database. Following is a summary of the major findings.

- All orange products were most frequently consumed at home. For away-from-home locations, schools led in consumption of fresh oranges; orange juice consumption was relatively evenly distributed among all away-from-home establishments with fast-food restaurants having a slight edge. Away-from-home orange drink consumption was the highest at fast-food establishments and in places such as community feeding centers, taverns, and vending machines, while fast-food establishments topped the list for consumption of other orange products.
- On a per capita basis, Northeasterners consumed the most oranges in all forms, followed by consumers in the West. Southerners and Midwesterners reported lower overall orange consumption. Those in the West had the highest consumption of fresh oranges, while those in the Northeast drank the most orange juice.
- Urban Americans consumed more total orange products (per capita) than those living in the suburbs or rural areas. Suburbanites appeared to have a stronger preference for fresh oranges over other orange products, while rural Americans appeared to prefer orange drink.
- While whites consumed the largest percentage of all orange products due to their larger share of the U.S. population, consumption on an individual basis is different. "Other" ethnic groups and Hispanics consumed the most fresh oranges per capita. Likewise, per capita consumption of orange juice is greater for Hispanics, "others," and blacks than for whites. Blacks, followed by Hispanics, consumed the most orange drink per capita, and whites had the greatest per capita consumption of other orange products.
- Individuals in all income groups consumed about the same amount of fresh oranges on a per capita basis. High-income individuals consumed the most orange juice, followed by those in the low-income category. Orange drink topped the orange products consumed by those in the middle-income group, although the low-income group drank more orange drink on a per capita basis. Those in the high-income group consumed more "other" orange products than either of the other two income groups.
- Males consumed more orange products than females except for products in the "other" category. Seniors (those 60 and over) consumed the largest amount of fresh oranges, on a per capita basis. Males 12 to 19 years old consumed the most orange juice on any given day. Females were bigger consumers of "other" orange products than fresh, juice, or drink. Orange products such as sections, jams (marmalade), sorbets, flavoring in entrees, etc. topped all other forms of orange consumption for females. Women 60 and over had the highest per capita orange consumption among females.

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