American Eating Habits Changing: Part 2

Grains, Vegetables, Fruit, and Sugars

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While diets are changing, a considerable gap remains between public health recommendations and consumers' practices. USDA Consumption Surveys indicate that Americans have shifted to a lower fat, higher carbohydrate diet in the past decade. While we are eating more grains, especially in mixtures, we still are not eating the amounts of high-fiber foods, including whole-grain products, legumes, vegetables, and fruit, that are recommended in the latest dietary guidance.

And, we eat more foods that contain large amounts of refined sugars. In fact, about two-fifths of the total carbohydrates available in the U.S. food supply comes from sugars added to foods and beverages. White bread is by far the favorite bread, and sweet baked goods (such as cookies and cakes) are very popular. Sugared soft drinks are consumed in large amounts. Alcoholic beverages also contribute many calories to the diet.

This is the second article of a two-part series which uses U.S. per capita food supply data (called disappearance—see box for more details), to gauge how our eating patterns are changing over time. The data are compiled annually by USDA's Economic Research Service. The nutritive value of the foods is estimated by USDA's Agricultural Research Service. This article focuses on grain products, legumes, vegetables, fruit, caloric sweeteners, and beverages. (See "American Eating Habits Changing, Part I: Meat Dairy, and Fats and Oils" in the September-December 1993 *FoodReview* for information on consumption of animal products.)

Nutritionists are very concerned that people are eating too many new manufactured foods that are

Sugar is, in a sense, the number-one food additive. It turns up in some unlikely places, such as pizza, bread, hot dogs, boxed rice mix, soup, crackers, spaghetti sauce, lunch meat, canned vegetables, fruit drinks, flavored yogurt, ketchup, salad dressing, mayonnaise, and some peanut butter.

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About the U.S. Food Supply Data

Patterns of food consumption have changed significantly in the United States since 1909, when USDA began to collect data on the food supply. These data represent the amount of foods, excluding alcohol, that disappear into domestic markets. While not actual consumption data, the numbers reflect changes in overall patterns of food use by the population over time. Between 1909 and 1990, for example, the proportion of calories available in the food supply from fats increased from 32 to 40 percent, the percentage from carbohydrates declined from 57 to 49 percent, and the percentage from protein remained unchanged at 11 percent.

USDA's Economic Research Service (ERS) annually calculates the amount of food available for human consumption in the United States. The U.S. Food Supply Series is the only historical series on food and nutrient availability in the country.

The total food supply is based on records of commodity flows from production to end uses. Total available supply is the sum of production, beginning inventories, and imports. For most commodities, measurable uses are exports, industrial uses, farm inputs (seed and feed), and year-end inventories. Human food use is normally not directly measured or statistically estimated. The availability of food for human use is, therefore, a residual component after subtracting other uses from the available total supply. In a few cases, food supplies are measured directly and one of the other use components becomes the residual category. This is the case for wheat, in which flour production is measurable and livestock feed becomes the residual.

The availability of food for human use represents disappearance of food into the marketing system. Hence, it is often referred to as food disappearance. Per capita food "consumption" or "use" usually is calculated by dividing total food disappearance by the U.S. total population. The food disappearance estimates measure supplies moving through trade channels for domestic consumption. However, because most foods are perishable, changes in disappearance presumably are associated with changes in actual consumption.

Food disappearance is often used to estimate human consumption. Used in this manner, the data usually provide an upper bound on the amount of food available for consumption. Estimates can overstate actual consumption because they include food that is discarded in processing, lost in spoilage, thrown away at home, or fed to pets.

Estimates of the nutrient availability of the food supply are derived from data on quantities of foods available for consumption per capita per year and from data on the nutrient composition of foods. USDA's Agricultural Research Service (ARS) annually estimates daily levels of food energy (calories) and 24 nutrients and food components in the U.S. food supply.

More details on ERS's food consumption series and ARS's nutrient availability series can be found in *Food Consumption, Prices, and Expenditures (SB-867)*. An electronic database also is available. Call toll-free, 1-800-999-6779, for ordering information.

low fat or nonfat but are high in sugar and calories and low in fiber. Whole-grain products, legumes, vegetables, and whole fruit that are high in vitamins, minerals, and especially fiber and that contain little added sugar are consumed in relatively low amounts, as compared to more processed foods that are stripped of fiber (such as fruit juices and drinks, white rice, and refined-flour products).

Between 1977-78 and 1989-91, the average intake of carbohydrates increased from 43 percent of total energy (calorie) intake to 49 percent, according to USDA surveys. In a diet providing 2,000 calories, this would translate to about 245 grams of carbohydrates. (Average fat intake declined between the two survey periods from 40 percent of total calories to 34 percent, still well above the 30-percent maximum recommended.)

A variety of sources, including the American Cancer Society and the American Heart Association, recommend that the carbohydrate content of the diet be increased to 55 to 60 percent of the total energy intake. The *Dietary Guidelines for Americans* recommend choosing a diet with plenty of vegetables, fruit, and grain products. Most dietary carbohydrates should be from complex carbohydrates, with some from naturally occurring simple

carbohydrates such as those found in fruit, vegetables, and milk. Refined sugars should be consumed only in moderation. An increase in dietary fiber above the current intake of about 12 grams per day is also recommended. An expert committee of the Life Sciences Research Office of the Federation of American Societies for Experimental Biology recommends 10 to 13 grams of fiber per 1,000 calories, or about 20 to 35 grams of fiber (roughly double the current intake) for the average healthy adult.

These references have been used to establish the Daily Reference Values (or Daily Values on food labels) for total carbohydrates and for fiber. The Daily Reference Value for total carbohydrates is calculated as 60 percent of calories, or 300 grams in a 2,000-calorie diet. The Daily Reference Value for fiber is based on a recommended intake of 10 to 13 grams per 1,000 calories or about 25 grams in a 2,000-calorie diet.

The *Dietary Guidelines for Americans* and the Food Guide Pyramid provide the basis for consumer education programs carried out by USDA and the U.S. Department of Health and Human Services, as well as by The American Dietetic Association and the American Heart Association. The Pyramid suggests 2-4 servings of fruit, 3-5 servings of vegetables, and 6-11 servings of grain products, including several servings of whole-grain products a day as well as frequent use of legumes as meat alternates or as starchy vegetables.

A number of recent surveys have identified fat as a nutrient of major concern to consumers. By contrast, concern about fiber in the diet remains low. To follow general recommendations to eat less fat and to eat more fiber, people need to better understand what the major food sources of these components are and how their present diet fits in.

Information is critical. The new nutrition label required on almost all processed foods in 1994 is a powerful tool to help give interested Americans the information they need to make healthful food choices. To help consumers get the most from the new food label, Government and industry are mounting a multiyear food labeling education campaign to increase consumer's knowledge and effective use of the new food label and to assist them in making accurate and sound dietary choices in accordance with the *Dietary Guidelines for Americans*. More and more industry groups use the Food Guide Pyramid to show how their product can fit into a healthful diet. Companies are also providing time-pressed meal preparers—a growing number of whom lack the know-how of basic food preparation—with fast and convenient recipes and menus that are more healthful than the traditional fare.

An increase in the availability of a wide variety of appealing foods that help consumers meet dietary recommendations is also crucial. Mandatory nutrition labeling and the availability of new technologies and ingredients are spurring the development and marketing of alternative products of higher nutritional quality. Yet successful implementation of dietary recommendations will require that consumers have greater access to health-promoting foods on those occasions when they eat out—particularly considering that meals and snacks away from home captured 46 percent of the U.S. food dollar in 1993 and accounted for 35 percent of total food.

Grain Products

Consumption of grain products has risen in recent years, after falling dramatically from the levels of the first half of the century. Per capita use of flour and cereal products was 187 pounds in 1992, compared with an annual average of 146 pounds in 1980-83, 135 pounds in 1970-74, 181 pounds in 1945-49, and 287 pounds in 1910-15 (see table 1). The expansion in grain supplies reflects ample stocks and strong consumer demand.

Table 1
With Consumption Up 28 Percent, Grains Have Become One of the Most Popular Foods

Item	Annual average			Change, 1980-83 to 1992
	1980-83	1991	1992	
	Pounds per capita[1]			*Percent*[2]
Flour and cereal products	146.3	185.6	187.0	27.8
Wheat flour	116.8	136.6	138.1	18.2
Durum flour[3]	6.3	10.9	13.3	111.0
Rye flour	.7	.6	.6	-9.0
Rice (milled basis)	10.5	16.8	16.9	61.0
Corn products[3]	13.7	21.9	21.9	60.1
Oat products[4]	3.6	8.6	8.5	134.9
Barley products[5]	1.0	.9	.9	-12.8

Notes: Totals may not add due to rounding. [1]Consumption of most items reflects supplies at the processing level. [2]Excludes quantities used in alcoholic beverages, corn sweeteners, industrial uses, and fuel. [3]Semolina and durum flour in products such as macaroni, spaghetti, and noodles. Calculated from unrounded data. [4]Corn flour, meal, hominy, grits, and starch. [5]Rolled oats, ready-to-eat cereals, oat flour, and oat bran. [6]Barley flour, pearl barley, barley malt, and malt extract used in food processing.

The "Whole" (Wheat) Story: Check the Label

Consumers must read the label: just because a bread is brown in color or contains wheat flour does not mean it is truly whole wheat. The type of flour present in the largest amount is listed first on the ingredient label. Sometimes a dark color is provided by "caramel coloring," which is also listed on the label.

By law, bread that is labeled "whole wheat" must be made from 100 percent whole-wheat flour. Not to be confused with whole-wheat bread, "wheat bread" may be made from varying proportions of whole-wheat flour and enriched white flour.

The milling of wheat to produce white flour results in the loss of nutrients as the bran and the germ are removed. While it is true that some of the nutrients (iron, niacin, thiamin, and riboflavin) lost in the milling process are replaced when white flour is enriched, the flour remains low in fiber as well as some trace elements such as zinc and copper.

The Nutrition Facts section of the food label provides information about how much dietary fiber is in a product and how it fits into the recommendations for an overall daily diet. Foods that contain 20 percent or more of the Daily Value for fiber per serving can state on the label that they are "high in dietary fiber." Products containing 10 to 19 percent of the Daily Value can state that they are "a good source of dietary fiber."

Food labels may also carry health claims related to fiber and chronic disease risk. Foods that contain at least 2.5 grams of fiber per serving and are low in fat may claim to reduce the risk of cancer.

Much of this growth was product-driven, as consumers gained appreciation for variety breads, hamburgers and other products made with buns sold through a rapidly expanding fast-food industry, and a proliferation of a broad range of products with ethnic origins. The expansion of instore baking and other shifts in the retail marketplace offering more products also spurred this growth in grain-based foods.

Consumption of these foods benefits from an older population. In 1991, for example, households headed by someone aged 45 years or older spent an average of 23 percent more per person for cereals and bakery products than did younger households. Demand for flour and cereal products might be expected to rise in the 1990's, since the first of the baby boom generation, the largest U.S. population group, reached age 45 in 1991—if the aging boomers follow their predecessors' path.

Wheat is the major grain eaten in the United States, with wheat flour and other products representing 74 percent of total grain consumption in 1992. However, wheat's share of total grain consumption declined 6 percentage points since 1980-83, as consumption of rice, corn, and oat products has gained momentum.

Consumption of wheat flour in 1992 was 138 pounds per person, up 18 percent from 1980-83. Consumption of durum wheat flour (mainly used in pasta) rose 111 percent from 1984 (the first year for which data are available) to 13 pounds per person in 1992.

Other cereal products increased as well. Per capita consumption of corn products (corn flour, cornmeal, hominy, grits, and starch) increased 60 percent since 1980-83 to 22 pounds per capita in 1992. Per capita use of rice and oat products (rolled oats, ready-to-eat cereals, oat flour, and oat bran) climbed 61 percent and 135 percent, respectively, from 1980-83 to 1992. In contrast, consumption of rye flour and barley products (barley flour, pearl barley, and barley malt and malt extract used in food processing) continued to decline.

Despite the 28-percent increase in per capita grain consumption from 1980-83 to 1992, average grain consumption still falls below recommended levels. One reason is that many people still think that starchy foods, such as bread and potatoes, are fattening. In fact, most calories come from the company they keep—calorie-rich additions, such as butter or margarine, sour cream, gravy, and jam or jelly. Starches provide only about 4 calories per gram, while fat provides about 9 calories per gram. There appears to be a gap in understanding that on a diet low in fat, a greater proportion of the calories must come from complex carbohydrates. It appears that the public does not understand that 6 servings from the bread and cereal food group represent just over 25 percent of

the day's total on a 1,600 calorie diet.

Several nationwide surveys of consumer knowledge, attitudes, and behavior conducted in 1993 help explain the gap between dietary guidance and consumer practices. A study sponsored by the Food Marketing Institute (FMI) and *Prevention* magazine found that more consumers are using nutrition labels in making food selections, with 61 percent indicating they consistently use labels for first-time purchases. Only one in four consistently consider the information about carbohydrates or fiber, however. Just 5 percent of the shoppers knew that 6 to 11 servings of bread and cereals are recommended in the Food Guide Pyramid, and only one in three knew that fiber intake should be between 20 and 35 grams per day. FMI's annual TRENDS study of American shoppers indicates that concern about fiber in the diet has changed little since 1985, never climbing above 5 percent of the population.

In a study of dietary habits conducted for the American Dietetic Association (ADA), only 15 percent of Americans age 25 years and over mentioned eating more grains, cereal, or fiber to achieve a more healthful diet. The FMI/*Prevention* study found that while 58 percent of shoppers had made major changes in their diets for health reasons during the past 3 years, only 14 percent reported eating more fiber.

Whole grains—except in the form of flour—may be something of a mystery to many Americans. While most people are familiar with brown rice and oatmeal, other whole grains such as cracked wheat, barley, kasha, quinoa, and bulgur may sound unfamiliar. Whole grains are products that contain the entire grain, or all the grain that is edible. They include the bran and germ portions which contain most of the fiber, vitamins, and minerals, as well as the starchy endosperm. The natural oils in the bran and the germ tend to spoil quickly, especially in warm environments. This is why whole grains tend to be more costly, and one reason why most grains are refined in the first place—to increase their shelf-life.

Fruit and Vegetables

Americans increased their consumption of fruit and vegetables roughly 10 percent in the past decade (tables 2 and 3). On a farm-weight basis, vegetables accounted for most of the increase. Consumers bought more fresh produce, frozen and dried fruit and vegetables, and canned tomatoes and fruit, and less fruit juice. However, weather disruptions of production and a lackluster economy dampened sales in 1991 and 1992.

Markets for fresh fruit and vegetables have become increasingly global, as improved refrigeration and transportation have made it possible to expand supply sources. This increase has expanded the variety and seasonal availability of fresh fruit and vegetables to U.S. consumers.

The growing influence of the U.S. Hispanic and Asian populations is creating demand for oriental vegetables, tropical produce, chili peppers, and other specialties such as tomatillos (a Mexican fruit—often used in salsas—whose flesh is similar to that of a green tomato) and jicamas (a Mexican root vegetable used primarily in salads). For example, U.S. per capita consumption of chili peppers more than doubled between 1980 and 1992, from 3.3 to 7.2 pounds annually. That brings U.S. consumption

Table 2
Per Capita Use of Commercial Vegetables Rose Nearly 17 Percent

Item	Annual average			Change, 1980-83 to 1992
	1980-83	1991	1992	
	Pounds per capita			*Percent* [1]
Vegetables (farm weight)	335.1	388.6	391.7	16.9
Fresh	147.4	161.9	169.1	14.7
Potatoes	48.5	46.4	48.9	.9
Other	98.9	115.5	120.2	21.5
Processed	181.3	218.5	214.7	18.4
Canned	97.2	112.8	110.7	13.9
Tomatoes	61.0	77.4	73.8	21.0
Other	36.3	35.4	36.9	1.8
Frozen	55.5	73.1	71.9	29.5
Potatoes	38.7	51.3	51.0	31.9
Other	16.9	21.8	20.9	24.0
Other[2]	28.4	32.5	32.1	14.9
Pulses[3]	6.4	8.1	7.9	23.9
Vegetables (retail weight):				
Fresh potatoes	46.5	44.6	47.0	.9
Frozen potatoes	19.3	25.6	25.5	32.0

Notes: Totals may not add due to rounding. Excludes produce from home gardens. [1]Calculated from unrounded data. [2]Potatoes and onions for chips, shoestrings, and dehydrating. [3]Dry edible beans, peas, and lentils.

of chili peppers (based on fresh-weight availability) higher than many traditional vegetables—including broccoli, cauliflower, peas, and spinach.

As concern about consumption of fat and calories has grown, food manufacturers, restaurateurs, and consumers have turned to vegetables, fruit, spices, and herbs to add zest to lowfat foods and meals. Per capita consumption of onions, garlic, lemons, limes, mushrooms, mustards, dried capsicum peppers, and fresh-cut herbs increased dramatically in the past decade.

Grocers are giving more space and attention to the fresh produce section. Today's medium-size grocery stores carry an average of over 300 produce items, compared with 150 in 1980 and 64 in 1970.

Restaurant salad bars, introduced in the mid- to late 1970's, grew so popular that fast-food chains and supermarkets jumped on the bandwagon. For example, Burger King started with salad bars in 1983 and then switched to prepackaged salads in 1988 to accommodate the increasing drive-thru traffic. McDonald's began offering prepackaged salads in 1986. Most supermarket chain stores added salad bars during 1982-84, often adjacent to the service deli. Most now also offer a wide array of prepared salads.

Consumption of fresh fruit rose 15 percent above the 1980-83 annual average to 121 pounds (retail weight) per person in 1992 (table 3). The rise was due entirely to sharp increases in fresh noncitrus fruit and melons. Americans' favorite fresh fruit is bananas (27 pounds per capita in 1992), followed by apples (19 pounds), watermelons (14 pounds), oranges (13 pounds), cantaloupes (9 pounds), and grapes (7 pounds).

Severe freezes in Florida and Texas in December 1989 and in California in December 1990 caused sharp drops in production and consumption of citrus juice since 1990 and in citrus fruit since 1991.

Table 3
Noncitrus Items and Melons Push Up Fresh Fruit Consumption

Item	Annual average			Change, 1980-83 to 1992
	1980-83	1991	1992	
	Pounds per capita			*Percent* [1]
Fruit (farm weight)	259	265	263	1.4
Fresh	106	113	123	15.3
For processing	153	152	140	-8.2
Fruit (retail weight)				
Fresh	104.6	111.0	120.6	15.2
Citrus	25.2	19.0	24.3	-3.5
Oranges	13.3	8.5	12.9	-3.4
Noncitrus	61.5	70.8	74.4	21.0
Apples	18.0	18.3	19.4	7.2
Bananas	21.5	25.1	27.3	26.7
Grapes	4.8	7.3	7.2	48.2
Melons	17.9	21.2	21.8	22.0
Canned[2]	13.7	12.3	14.4	5.4
Frozen	3.0	3.9	4.7	57.4
Dried	2.5	3.1	3.2	28.6
Juice[3]	63.4	63.8	59.6	-6.0
Citrus	51.3	45.6	42.6	-17.0
Orange	44.0	40.7	38.0	-13.6
Other	7.4	4.9	4.6	-37.1
Apple	9.0	15.1	13.2	46.9
Grape	2.3	2.8	3.5	52.4
Prune	.8	.3	.3	-66.7

Notes: Totals may not add due to rounding. Excludes produce from home gardens. [1]Calculated from unrounded data. [2]Excludes berries, cranberries, and pineapples. [3]Data unavailable for pineapple, cranberry, and other juices.

Per capita consumption of fresh and processed apples—particularly apple juice—has trended upward since 1980, but consumption remains highly variable across products. While per capita consumption of canned apples has remained fairly flat over the last decade, that of apple juice has increased dramatically—surpassing consumption of fresh apples (on a farm-weight basis) in 5 of the last 10 years. In 1992, apple juice accounted for 41 percent of total U.S. apple consumption, at 19.9 pounds (farm weight) per person.

Per capita consumption of fresh-market grapes has increased 80 percent since 1980, from 4.0 to 7.2 pounds annually. Factors behind this strong growth are increased domestic production of seedless grapes; better postharvest handling, which has improved the quality of grapes reaching consumers; lower relative prices; and extended seasonal availability, with large imports from Chile from December to May.

The combined per capita consumption of 19 major commercial fresh vegetables in 1992 was 17 per-

Carbohydrates in the Food Supply Increased in 1990 Over 1980

Analysis of the nutrient content of the U.S. food supply by USDA's Agricultural Research Service indicates increases in per capita consumption of starches (up 20 percent) and sugars (up 5 percent) between 1980 and 1990.

The daily level of per capita food energy in the food supply increased from roughly 3,400 calories in 1980 to 3,700 calories in 1990. This 9-percent increase reflects higher levels of all three energy-yielding nutrients: carbohydrates, fat, and protein. The proportion of calories from carbohydrates increased from 47 to 49 percent, while the share from fat decreased from 42 to 40 percent. Protein has consistently accounted for about 11 percent of calories.

The daily per capita amount of carbohydrates in the food supply increased 12 percent between 1980 and 1990, from 404 grams to 452 grams. Most of the increase in the early 1980's is due to increased use of high-fructose corn syrup. Greater demand for grains—primarily wheat flour, rice, and corn products—is mostly responsible for the increase in carbohydrates in the late 1980's. (These food supply estimates include carbohydrates that are lost or discarded as waste and are thus higher than estimates of actual intakes.)

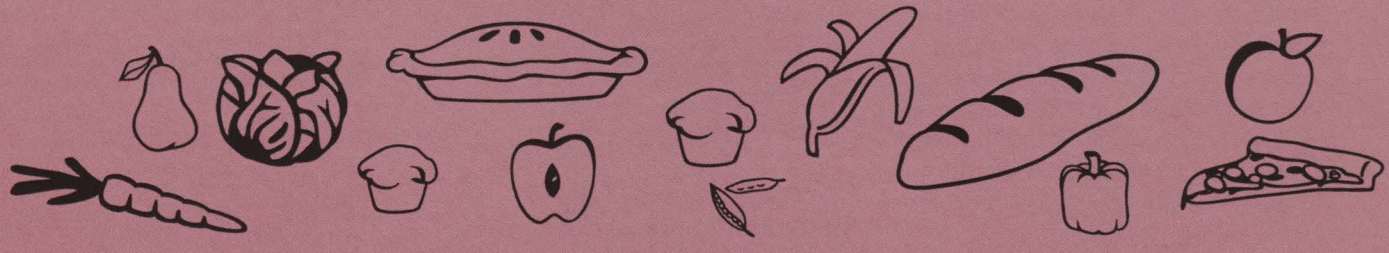
The daily per capita amount of starches increased from 185 grams to 223 grams, while the amount of sugars rose from 219 grams to 229 grams.

Food groups contributing carbohydrates in the food supply have shifted. For example, grain products contributed 40 percent of the total carbohydrates in the food supply in 1990, up from 36 percent in 1980. The proportion of total carbohydrates from added refined sugars declined to 38 percent in 1990 from 41 percent in 1980. The shares of total carbohydrates from vegetables, fruit, and dairy products also declined during the 1980's.

Grain products contributed 80 percent of starches in the 1990 food supply; vegetables, 14 percent; legumes, nuts, and soy, 4 percent; and miscellaneous items, 2 percent.

Refined and processed sugars added to foods and beverages contributed 75 percent of the total sugars available in the 1990 food supply; fruit, 12 percent; dairy products, 10 percent; and vegetables, 3 percent.

Information on the amount of dietary fiber available in the food supply is not available.



cent above the annual average for 1980-83 (table 2). Consumption of tomatoes used for canning also increased 21 percent, reflecting the popularity of prepared tomato-based salsa, picante, taco, pizza, and spaghetti sauces. However, per capita consumption of other vegetables used for canning remained flat during the past 12 years, as consumers substituted fresh and frozen for canned.

Americans consumed an average of 25.5 pounds of frozen potato products (retail weight) per person in 1992, a 32-percent increase from an average 19 pounds annually per person in 1980-83. In 1992, one-third of all potatoes grown in the United States was processed into frozen products—mainly french fries—due to demand from restaurants and other eating places. In 1991, about 87 percent of frozen french fries—4.8 billion pounds—was sold by the foodservice industry.

Concern about nutrition, the rising popularity of restaurants specializing in Mexican and East Indian cuisine, and interest over the past decade in ethnic foods are bringing beans and other legumes back into the American culinary mainstream. Dry bean, pea, and lentil use averaged 6.4 pounds per person a year during 1980-83 and

Per Capita Levels of Carbohydrates: Sugars and Starches in the U.S. Food Supply, 1980 and 1990

Item	Total carbohydrates[1]				Starches				Sugars			
	Grams per day		Percent of total		Grams per day		Percent of total		Grams per day		Percent of total	
	1980	1990	1980	1990	1980	1990	1980	1990	1980	1990	1980	1990
From all sources[1]	404.1	452.4	100.0	100.0	185.5	223.1	100.0	100.0	218.6	229.3	100.0	100.0
Starches	185.5	223.1	45.9	49.3	185.5	223.1	100.0	100.0	—	—	—	—
Sugars[2]	218.6	229.3	54.1	50.7	—	—	—	—	218.6	229.3	100.0	100.0
Naturally occurring[2]	54.5	56.4	13.5	12.5	—	—	—	—	54.5	56.4	24.9	24.6
Added refined[2]	164.0	172.9	40.6	38.2	—	—	—	—	164.0	172.9	75.1	75.4
Meat, poultry, and fish	.4	.4	.1	.1	.4	.4	.2	.2	—	—	—	—
Eggs	.5	.4	.1	.1	—	—	—	—	.5	.4	.2	.2
Dairy (excluding butter)	22.5	22.8	5.6	5.0	—	—	—	—	22.5	22.8	10.3	9.9
Beverage milks	14.7	13.8	3.6	3.1	—	—	—	—	14.7	13.8	6.7	6.0
Other	7.8	9.0	2.0	1.9	—	—	—	—	7.8	9.0	3.6	3.9
Fats and oils	—	—	—	—	—	—	—	—	—	—	—	—
Sugar and sweeteners[2]	164.0	172.9	40.6	38.2	—	—	—	—	164.0	172.9	75.1	75.4
Fruit	26.2	27.5	6.5	6.1	—	—	—	—	26.2	27.5	12.0	12.0
Vegetables	36.7	37.6	9.1	8.3	31.3	31.9	16.9	14.3	5.4	5.7	2.5	2.5
White potatoes	19.1	19.9	4.7	4.4	19.1	19.9	10.3	8.9	—	—	—	—
Tomatoes	4.5	4.6	1.1	1.0	—	—	—	—	4.5	4.6	2.1	2.0
Legumes, nuts, and soy	7.2	8.0	1.8	1.8	7.2	8.0	3.9	3.6	—	—	—	—
Grains	143.4	178.7	35.5	39.5	143.4	178.7	77.3	80.1	—	—	—	—
Miscellaneous items[3]	3.2	4.1	.8	.9	3.2	4.1	1.7	1.8	—	—	—	—

Notes: Totals may not add due to rounding. — = Less than 0.05. [1]Excludes dietary fiber, which is a carbohydrate that cannot be digested in the human stomach and small intestine, and thus provides little energy. [2]Sugars and sweeteners include sugars in manufactured foods, such as ice cream, canned fruit in syrup, sweet baked goods, and soft drinks, and sugars in such forms as table sugar and honey. The sugars shown for other categories refer to sugars that occur naturally in the specified commodity. For example, the sugar for dairy refers to lactose, the sugar that occurs naturally in milk. [3]Includes coffee, tea, herbs, spices, and chocolate liquor, which is what remains after cocoa beans have been hulled and roasted. Source: USDA's Agricultural Research Service.

then jumped 26 percent to 7.9 pounds by 1992.

Despite the gains in the popularity and availability of fruit and vegetables in the past decade, consumption remains well below the levels recommended by Government and health authorities. USDA food intake surveys in 1989-90 indicate that more than a fourth of the population ate no fruit and drank no fruit juice during the 3 consecutive days of recordkeeping. A larger proportion of low-income people (33 percent) ate no fruit than did high-income people (23 percent). Total fruit and vegetable intake generally increased with age. Only about 25 percent of individuals ate legumes in the 3-day period of the survey.

Prices explain some of the problem. Between 1980 and 1992, retail prices more than doubled (up 109 percent) for fresh produce and rose 62 percent for processed fruit and vegetables. In comparison, prices rose 81 percent for cereal and bakery products, 47 percent for sugar and sweets, 41 percent for dairy products, 41 percent for red meat and poultry, and 22 percent for eggs. Disruptions in production due to the vagaries of weather, coupled with strong consumer demand since the mid-1980's, lie behind higher retail prices for fresh produce, which tend to be sticky on the downside.

Another part of the problem is lack of consumer awareness of the importance of consuming recommended amounts. To increase consumers' knowledge, the National Cancer Institute (NCI) is sponsoring "5-a-Day for Better Health"—the first nationwide health promotion to focus on the positive role of fruit and vegetable consumption in reducing the risk of cancer and other chronic diseases. The promotion is designed to be an active partnership between NCI, the produce industry, Government agencies, and health professionals.

Results from NCI surveys show that 5-a-Day and the Food Guide Pyramid are making headway. In 1993, 29 percent of Americans knew they should eat at least five servings of fruit and vegetables daily, compared with 22 percent in 1992 and only 8 percent in 1991.

Another factor behind the low consumption is consumers' desire for convenience. A trend toward drive-thru, carryout, and home-delivered meals has served to squash the salad bar popularity of the 1980's at many fast-food places.

Industry is responding to the challenge of adding convenience to the produce department with a host of new products and services. Carrots, celery, broccoli, cauliflower, salad mixes, pineapples, citrus, and melons—a whole variety of fresh products—are now being washed, peeled, cored, cut, and otherwise prepared and then packaged so consumers can just pick them up at their retail outlet, open the package, and use. Mixtures ready for stirfrying or microwaving save time and usually come with preparation instructions. Fresh, whole peeled onions and potatoes—which are vacuum-packed to retain freshness and color—are already popular in food service and soon to come to grocery stores.

Such items—convenient for snacks and lunchboxes—are snapped up by time-pressed consumers who are willing to pay more for the ease. Fresh-cut baby carrots and salad mixes typically cost double the price of the traditional (commodity) carrots and lettuce. Yet, these value-added newcomers have not hurt sales of commodity carrots and lettuce. Some consumers continue to use iceberg and leaf lettuces as a salad staple, adding salad mixes (the newer ones include a variety of fresh herbs) to make the salad more interesting. According to Information Resources Inc. (a research firm which tracks supermarket sales of bar-coded items), packaged fresh-cut salad mixes (including coleslaw mixes) accounted for $323 million in sales in 1993, a 93-percent increase in sales in 1 year.

Value-added products (such as fresh-cut items and salad mixes) are estimated by the industry to account for roughly 5 percent of retail produce sales in the United States. The trend is stronger in some parts of the country—California, for example—than in others. Among retailers polled by *Supermarket News*, reported sales ranged from 2 to 3 percent to 15 percent. But many analysts think that a vigorous move to better storage, handling, and display of value-added produce—in refrigerated cases that maintain the optimum 32- to 34-degree temperatures—could boost sales as high as 25 percent by the end of the decade.

The new nutrition label is a powerful tool to help give interested Americans the information they need to make healthful food choices.

Processed vegetable products also offer consumers considerable time savings. In 1993, for example, Contadina introduced canned pasta-ready tomatoes for an instant sauce or ingredient. VegAll Stir Fry and Recipe vegetables come frozen in varieties and sizes for adding to recipes.

Caloric and Low-Calorie Sweeteners

Americans have become conspicuous consumers of sugar and sweet-tasting foods and beverages. Total per capita use of caloric sweeteners (on a dry-weight basis)—comprised mainly of sucrose (table sugar made from cane or beets) and corn sweeteners (notably high-fructose corn syrup, called HFCS)—rose 16 percent by 1992 from 1980-83 (table 4). (Also see "Food Consumption Trends...At a Glance," following this article.) In 1992, Americans consumed, on average, a record 144 pounds of caloric sweeteners, compared with 124 pounds per person annually in 1980-83. That is more than one-third pound of added sugars a day for each American.

A striking change in the availability of specific sugars has occurred in the past decade. Sucrose's share in total caloric sweetener consumption dropped from 62 percent in 1980-83 to 45 percent in 1992. In contrast, corn sweetener's share increased from 37 percent in 1980-83 to 54 percent in 1992. All other caloric sweeteners

Table 4

Although Use of Sweeteners Rose 24 Percent, Sucrose Lost Share to High-Fructose Corn Syrup and Aspartame

Item	Annual average			Change, 1980-83 to 1991
	1980-83	1991	1992	
	Pounds per capita			*Percent* [1]
Total sweeteners	133.6	164.9	NA	23.4
Caloric sweeteners[2]	124.0	140.6	143.8	13.4
Sucrose[3]	76.8	63.8	64.5	-16.9
Corn sweeteners	46.0	75.4	77.9	64.1
High-fructose corn syrup	24.9	50.7	52.3	103.4
Glucose	17.1	20.2	21.1	18.1
Dextrose	3.9	4.5	4.5	15.5
Honey and edible syrup[4]	1.3	1.4	1.4	4.5
High-intensity sweeteners[5]	9.6	24.3	NA	153.4
Saccharin	8.4	7.3	NA	-13.2
Aspartame	1.2	17.0	NA	1,344.6
Candy[6]	16.7	20.8	21.4	24.1

Notes: Totals may not add due to rounding. NA = Not available. [1]Calculated from unrounded data. [2]Dry-weight basis. [3]Table sugar made from cane or beets. [4]Contains estimates of sorgo, maple, cane, molasses, and refiner's syrup. [5]Sugar-sweetness equivalent (SSE). Assumes saccharin is 300 times as sweet as sugar (sucrose) and aspartame is 200 times as sweet. [6]The sweeteners used in making candy are also included in the estimates above.

combined—including honey, maple syrup, and molasses—maintained a 1-percent share during the same period.

Per capita use of high-intensity, or low-calorie, sweeteners (mainly aspartame and saccharin) has more than tripled since 1980 to a level approaching 25 pounds (sugar-sweetness equivalent) per year. (For more details on this product and market, see "Have High-Intensity Sweeteners Reached Their Peak?" in the September-December 1993 *FoodReview*.) This share of the total sweetener market grew from less than 6 percent in 1980 to 15 percent.

Per capita use of sucrose dropped from 84 pounds per person in 1980 to a low of 60 pounds per person in 1986. Use of sucrose increased since 1986—reaching 64.5 pounds per person in 1992.

Much of the displacement of sucrose by HFCS and aspartame has been in soft drinks. Between 1980 and 1992, beverage manufacturers reduced their use of sucrose from 19 pounds to 1 pound per capita. Similarly, canned, bottled, and frozen food manufacturers together cut their use of sucrose from 4.5 pounds to 2.5 pounds per capita over the same period, as they substituted corn sweeteners for sucrose and as consumers substituted fresh fruit and fruit canned in juice or light syrup for fruit canned in heavy syrup.

The uptick in sucrose consumption since 1986 reflects increased use by industrial bakers, confectioners, and breakfast cereal manufacturers. The percentage of supermarkets with instore bakeries jumped from 39 percent in 1980 to 60 percent in 1988, according to *Progressive Grocer*. This percentage has been stable for the last 5 years, but bakery sales continue to far outpace the stores' total sales. Sweets—cakes, doughnuts, cookies, pies, and pastries—accounted for roughly two-thirds of service bakery sales in 1992. The fastest-growing bakery item is cakes.

Use of corn sweeteners (HFCS, glucose, and dextrose) rose from 39 pounds (dry basis) per capita in 1980 to a record 78 pounds in 1992, mainly because of HFCS. Use of HFCS, which is significantly less expensive than sucrose, rose from 18 pounds per person in 1980 to 52 pounds in 1992. In 1992, beverages accounted for 71 percent of total HFCS deliveries for domestic food and beverage use, compared with 36 percent in 1980. Use of HFCS in bakery products and processed foods has jumped even higher since 1990.

If the per capita food supply estimates—which show a 16-percent increase in total caloric sweeteners and a tripling in HFCS since 1980—accurately reflect trends in actual consumption, then each American, on average, now consumes signifi-

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cantly more added fructose than in 1980. (Sucrose is half fructose; HFCS-55 is 55 percent fructose and accounts for more than three-quarters of the increased use of total HFCS since 1980; HFCS-42 accounts for the remainder.)

This apparent increase gives rise to concern among nutritionists because evidence implicates diets high in fructose with increased blood lipid levels. (Lipids is the technical term for fats, waxes, and fatty compounds.) A task force of scientists convened by the Food and Drug Administration found in 1986 no conclusive evidence that a high sugar intake is a risk factor for heart disease, whether by raising blood cholesterol, triglycerides (a fat in the blood), or blood pressure, "in the general population." However, some researchers suggest that a small number of "carbohydrate-sensitive" individuals—such as those with insulin or triglyceride levels that are high to start with—may be particularly sensitive to sugar (especially fructose) and respond with raised cholesterol and triglyceride levels. USDA's Agricultural Research Service is expanding its research of this issue.

One quarter of the calories available from the 1990 per capita food supply (excluding alcoholic beverages) came from sugars. Lactose from milk and the sugars occurring naturally in fruit and vegetables accounted for roughly one-fourth of this amount. The remaining three-fourths—about 19 percent of total calories—was from sugars added to foods.

Sugar—including sucrose, corn sweeteners, honey, and molasses—is, in a sense, the number-one food additive. It turns up in some unlikely places, such as pizza, bread, hot dogs, boxed rice mix, soup, crackers, spaghetti sauce, lunch meat, canned vegetables, fruit drinks, flavored yogurt, ketchup, salad dressing, mayonnaise, and some peanut butter.

Nearly one-fifth (18 percent) of the added sugars in the U.S. food supply comes in carbonated soft drinks. A 12-ounce cola contains 9 teaspoons of sugar. Each American consumed, on average, roughly 30 gallons of sugared soft drinks in 1992—about 10.5 ounces a day, an amount that contains about 8 teaspoons of sugar.

The new food label, which lists the amount of sugars in grams (4 grams is equivalent to 1 teaspoon) in a serving of the food, can help people who are trying to moderate their sugar intake. This number includes both added sugars and those naturally present. Foods with natural sugars, such as milk and fruit, are also good sources of other nutrients, such as vitamins and minerals.

New products may also help. Food processors are introducing many "no added sugar" and "reduced sugar" foods. New sweeteners will likely enter the market in the next decade. With more alternative sweeteners, food processors can custom-blend caloric and high-intensity sweeteners to reduce calories and to achieve an optimum combination of taste, cost, and functional properties for specific applications.

Beverages

U.S. per capita soft drink consumption jumped 29 percent from 35 gallons per person in 1980 to 45 gallons in 1992 (table 5).

Supermarket customers spend more money on carbonated soft

Table 5
Soft Drinks Are By Far the Most Popular Beverage

Item	Annual average			Change, 1980-83 to 1992
	1980-83	1991	1992	
	Gallons per capita			*Percent* [1]
Soft drinks[2]	35.3	44.9	45.4	28.8
Coffee	26.3	27.1	26.9	2.5
Milk	26.8	25.7	25.3	-5.5
Juices[3]	7.3	7.3	6.8	-6.0
Citrus	5.9	5.2	4.9	-17.0
Apple	1.0	1.7	1.5	46.9
Grape	.3	.3	.4	52.4
Prune	.1	—	—	-66.7
Tea	7.1	6.9	7.1	-.2
Bottled water[4]	2.9	8.0	8.2	187.5
Club soda/seltzer	.5	.8	.8	53.2
Alcoholic beverages	28.5	26.4	26.1	-8.5
Beer	24.4	23.1	22.8	-6.3
Wine	2.2	1.9	1.9	-15.5
Distilled spirits	1.9	1.4	1.4	-28.1

Notes: Totals may not add due to rounding. — = Less than 0.05 gallon. [1]Calculated from unrounded data. [2]Revised in accord with the Census of Manufactures. [3]Single-strength equivalent. Data unavailable for pineapple, cranberry, and other juices. [4]Source: Beverage Marketing Corporation.

drinks than any other product scanned at the checkout counter (excludes fresh meat and poultry, whose prices are usually keyed-in and not scanned), according to a study by Information Resources, Inc. In 1992, soda-fountain sales of soft drinks increased by more than 4 percent, while the industry's bottle and can sales grew at 1.5 percent or less, according to *Beverage Digest*, a trade publication. The growth reflects a huge marketing and promotional push by soft-drink makers, who face shelf-space limitations, discounting, and growing competition from private labels and alternative drinks in grocery stores.

Fountain drinks, which now account for a quarter of soft-drink industry sales, are getting a big push from so-called "combo meal" deals at fast-food places. (These fixed-price discount meals of, for example, burgers, fries, and soft drinks generally promote the beverage being free.) And, the drinks are getting bigger. When Wendy's increased the medium drink in its combo meals to 20 ounces from 16 ounces, its soft-drink sales increased at least 10 percent. Now, Wendy's offers a 32-ounce "Biggie" drink for 8 to 10 cents more. In 1992, Subway came out with a 44-ounce drink.

For the U.S. population age 21 years and older, per capita consumption of alcoholic beverages reached a record high 43.1 gallons in 1981, but it declined steadily to 37.4 gallons by 1992. Between 1981 and 1992, annual average beer consumption declined 11 percent to 32.7 gallons per adult, and average wine use declined 18 percent to 2.7 gallons per adult. Average consumption of distilled spirits declined by half between 1981 and 1992 to 2 gallons per adult (the same as 1991's 21-year low).

"Despite considerable progress toward a lower fat, higher carbohydrate diet in the past decade, per capita use of caloric sweeteners has reached an all-time high and average fiber intake remains very low."

As measured in the Consumer Expenditures Surveys conducted by the Bureau of Labor Statistics, mean annual household expenditures for alcoholic beverages (in constant 1992 dollars) decreased by 36 percent between 1980 and 1992 (from $470 to $301). Spending for alcoholic beverages is expected to continue to decline, and the number of households purchasing alcoholic beverages is also likely to continue shrinking.

Indications of a trend toward less widespread alcohol consumption may reflect changing demographics—a smaller percentage of the population is in peak drinking years. The proportion of the population over age 60 is increasing—this segment is less likely to indulge. Age groups with higher incomes and more leisure time are becoming less likely to spend money on alcoholic beverages and are the most receptive to moderation-based appeals centered on safety, health, and fitness.

Sharply higher Federal excise taxes added to all alcoholic beverages beginning January 1, 1991, also may have curtailed alcoholic beverage consumption since then. In addition to the tax increases, some manufacturers raised prices. Between 1990 and 1992, retail prices, as measured in the Consumer Price Index (CPI), for packaged alcoholic beverages (excludes alcoholic drinks served in bars and foodservice establishments) increased by 15.6 percent versus 3.4 percent for the CPI for food at home. ■