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## COUNTING AMERICA'S FOOD



Annual Issue on Food Consumption and Prices





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# Consumption Trends Favor Fresh, Lowfat, and Sweet

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USDA's aggregate food consumption index rose 1 percent in 1984 to a record-high level (*see sidebar box*). The predominant trends in the latest data indicate that Americans increasingly favor foods that are fresh, lowfat, and sweet. Consumers, for example, are choosing more lowfat milk products and fresh and frozen vegetables. Per capita consumption of many fresh fruits has increased, while canned fruit consumption has fallen. Per capita sweetener use has climbed to historically high levels, while use of fats and oils declined in 1984 for the first time in several years. We are drinking less beer and hard liquor, but more wine and soft drinks.

The food industry has capitalized on these trends with new products advertised as "lite," lean, and convenient. A total of 1,603 new products were introduced in the first 9 months of 1985, 11 percent more than in the same period of 1984. Many of the new products are packaged and sold as frozen or refrigerated foods. Restaurants are taking more orders for salads, pizza, Mexican food, and chicken as customers are eating less steak and hamburger.

## Red Meat Down Slightly, Poultry Up

Red meat consumption fell by 0.3 pound in 1984 to 143.7 pounds per capita (*table 1*). Beef declined 0.1 pound in 1984 to 78.6 pounds, while veal increased 0.2 pound to 1.8 pounds. Pork fell 0.5 pound to 61.7 pounds per capita. Preliminary estimates for 1985 indicate that red meat consumption dropped another 0.3 pound to 143.4 pounds per capita.

Cattle and hog producers continue to liquidate their herds in response to poor returns and cash flow problems. This reduction in livestock inventories is expected to have a major impact on supplies

**Table 1. Consumption Data Show Trend to Fresh, Lowfat, and Sweet**

Commodity	1970-74	1975-79	1980-84	1982	1983	1984
Pounds per capita						
<b>Meat, fish, and eggs</b>						
Red meats	150.9	148.1	144.0	139.3	144.0	143.7
Beef and veal	85.9	90.7	79.3	78.8	80.4	80.4
Pork	62.5	56.0	63.2	59.0	62.2	61.7
Lamb and mutton	.6	1.5	1.5	1.5	1.5	1.5
Poultry	49.6	54.4	64.2	64.2	65.5	67.5
Fish, edible weight	12.1	12.9	12.7	12.3	13.1	13.6
Eggs	40.0	34.7	33.6	33.4	33.1	33.0
<b>Dairy products</b>						
Total milk equivalent	553.0	543.0	560.8	559.8	576.3	581.9
Cheese	18.2	20.7	19.7	20.1	20.6	21.7
Fluid milk and cream	272.3	260.4	244.5	241.9	242.3	243.4
Frozen desserts	28.0	27.5	26.6	26.4	27.0	26.9
<b>Fats and oils</b>						
Total	55.8	57.4	61.4	61.4	63.2	61.6
Animal fats	14.0	11.4	13.1	12.5	13.4	13.5
Vegetable oils	41.8	46.0	48.3	48.9	49.8	48.1
<b>Fruits</b>						
Fresh	76.3	80.9	85.7	83.9	87.5	86.6
Processed						
Juices <sup>1</sup>	27.4	31.2	32.7	NA	NA	NA
Canned, frozen, and dried	27.3	24.1	20.8	18.8	18.8	NA
<b>Vegetables</b>						
Fresh <sup>2, 3</sup>	90.0	93.5	NA	71.2	71.0	75.4
Canned <sup>1, 2</sup>	35.5	34.9	NA	32.6	33.7	32.6
Frozen	10.0	10.3	11.2	10.7	11.1	12.0
<b>Potatoes and sweetpotatoes<sup>3</sup></b>						
Total, fresh weight equivalent	121.7	124.2	122.4	120.8	125.3	125.6
Fresh, retail weight	54.8	54.0	52.9	51.8	53.8	53.1
Processed, retail weight	21.4	23.4	26.1	25.8	27.1	27.4
<b>Grain products</b>						
Wheat flour	111.0	116.3	117.3	119.6	116.1	117.8
Pasta	8.6	10.4	11.5	11.5	11.6	12.3
Breakfast cereals	11.5	12.5	12.3	12.2	12.2	12.2
Rice	7.2	7.9	10.2	11.8	9.8	8.6
<b>Sugar and sweeteners</b>						
Corn sweeteners	26.9	40.4	61.2	73.7	71.0	77.3
Sugar (refined)	100.5	91.5	75.1	73.8	71.0	67.5
<b>Nonalcoholic beverages</b>						
Coffee (gallons)	32.2	27.1	26.0	25.3	25.2	25.8
Soft drinks (gallons)	25.5	32.7	40.3	39.5	41.1	44.2
<b>Aggregate food consumption index (1967 = 100)</b>	102.5	104.2	105.6	104.5	106.7	107.5

<sup>1</sup>Total not available for some years due to lack of data for specific items. <sup>2</sup>Beginning in 1982, data are not comparable to previous years. <sup>3</sup>Excludes consumption of home garden produce. NA = Not available.

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## Total Pounds of Food No Longer Reported by ERS

Beginning in 1981, cutbacks in the USDA budget for collection of production statistics, as well as reductions in data from industry sources, have limited ERS' ability to measure supply and utilization of a number of fruit and vegetable categories with the same accuracy as in the past. ERS has decided not to compromise the integrity of the consumption series by including far less accurate estimates of fruit and vegetable consumption than previously published.

Furthermore, ERS is no longer able to accurately calculate total pounds of food consumed. Instead, the index of per capita food consumption can be used to measure annual changes in the quantity of retail food consumed per person. In addition to the total, separate indices are calculated for meat, poultry, and fish; eggs; dairy products; fats and oils; vegetables; fruits; potatoes and sweetpotatoes; beans, peas, and nuts; flour and cereal products; sugar and other sweeteners; and coffee, tea, and cocoa.

The index series has been published since 1950. However, because of the recent lack of data for certain items, ERS was forced to adjust the index for the entire 1965-84 period

to include only those items for which 1984 data were available.

To illustrate how the food consumption index is calculated and interpreted, consider 1984 as an example. Pounds of food consumed on a retail weight basis in that year were multiplied by prices in the base year, 1967. The result was divided by the identical calculation for 1967. An index value of 105.5 for meat, poultry, and fish in 1984 indicates that total per capita consumption of those foods was 5.5 percent above the 1967 base year.

Because the prices are held constant at the base year values, changes in the index reflect changes in the quantity of foods consumed, as well as shifts from low-priced to higher priced foods. This means that a 1-pound increase in beef consumption will have a greater influence on the total food index than an identical increase in flour.

Further information on the food consumption index will be presented in a forthcoming ERS report, *Statistics on Consumption and Utilization of Agricultural Commodities: How they are Constructed and Used*. For ordering details, contact Karen Bunch, (202) 786-1870.

of meat in 1986, possibly cutting consumption by more than 5 percent (table 2) to 135.8 pounds per capita. That would be the lowest level in 24 years.

Poultry continues its 20-year rise in popularity. Americans ate about 1 percent more turkey, while chicken consumption increased another 3 percent to a record 55.7 pounds. Demand for poultry was strong in 1985 and is expected to rise again in 1986, with per capita gains of 3 and 4 percent each year.

In the last 15 years, increases in poultry have more than offset declines in red meat, so that total meat consumption per capita gradually trended upward (figure 1). For red meats, annual average consumption in 1980-84 was 144.0 pounds, compared with 148.1 for 1975-79 and 150.9 in 1970-74. In contrast, poultry consumption increased steadily from 49.6 pounds in 1970-74 to 64.2 pounds in 1980-84. Over this period, retail poultry prices have fallen 24 percent relative to red meat prices. Because of expected reductions in beef and pork supplies,

**Table 2. Per Capita Food Consumption Expected To Decline in 1986**

Commodity	1985 <sup>1</sup>	1986 <sup>2</sup>
	Percent change from previous year	
<b>Total food</b>	+1	-1 to -2
<b>Animal products</b>	+1	-2 to -3
Meat	0	-5 to -6
Poultry	+3	+3 to +4
Fish	+1	+1 to +2
Dairy	0 to +1	0 to +1
<b>Crop products</b>	+1	0 to -1
Fats and oils	+2	-1 to -2
Vegetables	0 to +1	+1 to +2
Fruit	-1 to 0	0
Potatoes	0 to +1	0 to +1
Cereal products	+2	0 to +1
Sugar and sweeteners	+1	0 to +1

<sup>1</sup>Preliminary. <sup>2</sup>Forecast.

combined per capita consumption of red meat and poultry will probably decline in 1986, but remain near 1985's record level.

Fish consumption rose nearly 4 percent in 1984 to 13.6 pounds per capita (excluding game fish), a new high. Americans are eating 12 percent more fish than in 1970-74, with most of the increase in fresh and frozen products. The fish industry has benefited from the healthy image of its product, as well as from increased away-from-home eating. U.S. Department of Commerce analysts estimate that 60 percent of fish is eaten away from home.

Fish consumption should continue to gain in the next few years with the introduction of new products and a greater availability of fresh fish in supermarkets.

### Total Dairy Products Up

Use of dairy products increased 1 percent in 1984 to 581.9 pounds per capita on a milk-equivalent basis (the amount of milk required to produce the different dairy products). The actual weight of the products totaled 306.2 pounds, up slightly from 303.9 pounds in 1983. Consumption of cheese, lowfat and skim milk,



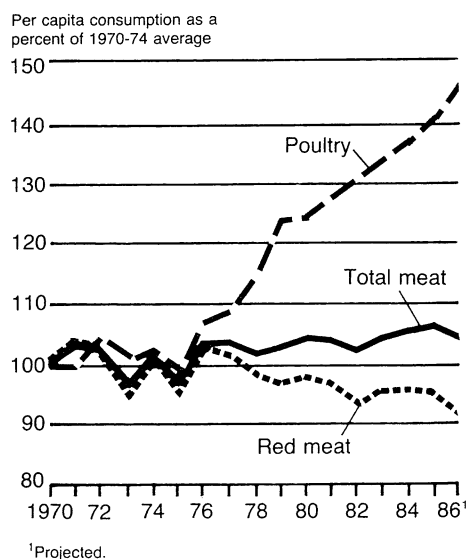
canned milk, and cream and specialty products increased in 1984.

Despite stable retail prices and a government-sponsored dairy promotion program that began in September 1984, per capita fluid milk consumption increased only slightly in 1984. Whole milk consumption decreased 3.6 percent to 125.2 pounds per capita, while lowfat milk products increased 3.9 percent to 111.3 pounds.

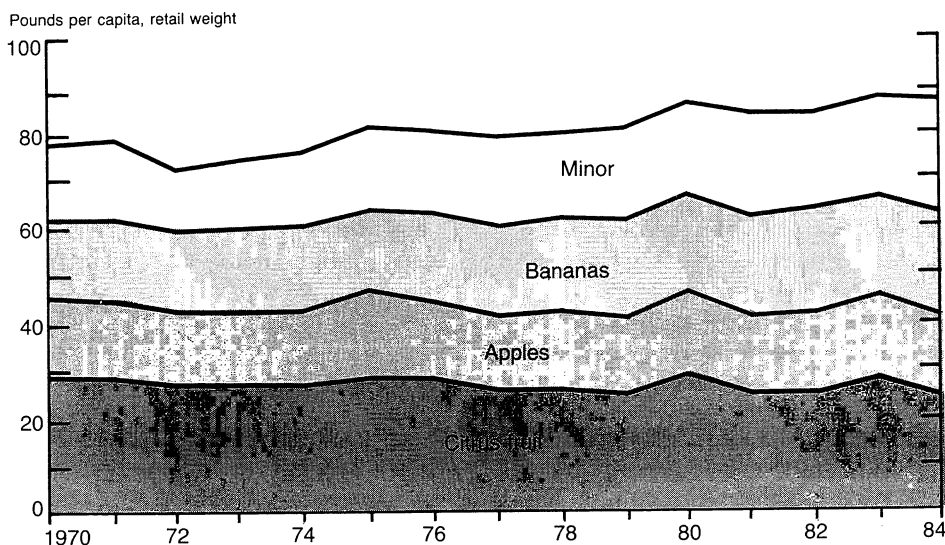
Cream products regained popularity in 1984, with increases in the consumption of half-and-half and heavy and sour varieties. Total consumption of cream reached 6.9 pounds per capita, the highest level in 20 years. Yogurt sales continued to climb, increasing 12.5 percent in 1984 to 3.6 pounds. Since 1970, yogurt sales have increased more than 350 percent.

Cheese grew even more popular in 1984, with both American and other types increasing 4 percent to 21.7 pounds per capita. USDA distributed 594 million pounds of free cheese in 1984, down 6 percent from the 1983 high. These donations accounted for approximately 12 per-

**Figure 1. Red Meat Consumption Expected To Decline Further**



**Figure 2. Fresh Fruit Consumption Shifts to Minor Fruits**



cent of total cheese consumption and 21 percent of the American cheese eaten in 1984.

Per capita consumption of Italian-type cheeses (particularly mozzarella) has more than doubled in the last 15 years, and these cheeses now account for 25 percent of total cheese use. Increased popularity of pizza and other Italian dishes have contributed to expanded use. However, cheddar cheese is still the American favorite at 2.3 billion pounds in 1984, roughly 42 percent of total cheese consumption.

Trends toward lowfat milk and cheese are expected to continue in the next few years. Based on data through September 1985, sales of whole milk were down 3 percent last year, while lowfat and skim milk increased 7 percent. Sales of cheese other than American increased an estimated 5 percent in 1985. Overall dairy product consumption is projected to increase by less than 1 percent on a per capita basis in both 1985 and 1986.

#### Fats and Oils Decline

Use of fats and oils declined in 1984 for the first time in 7 years. Total product

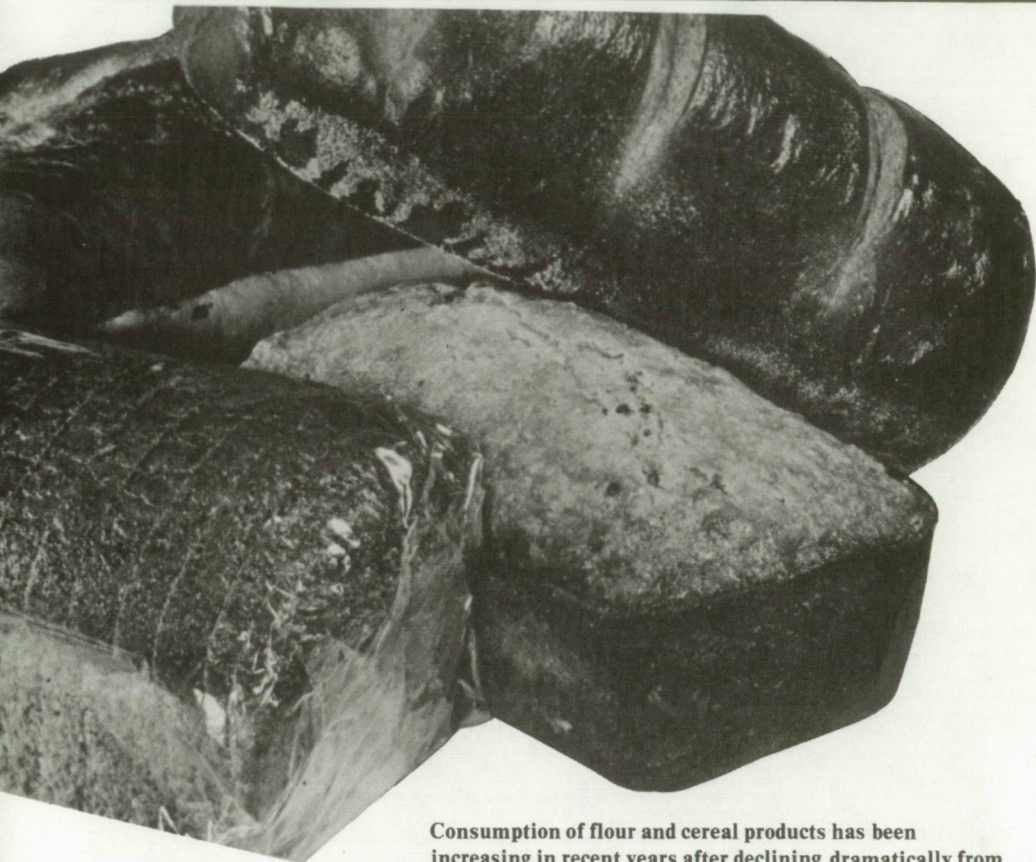
weight fell 2.5 percent to 61.6 pounds per capita, with declines in butter, margarine, and salad oil. Supplies of soybean oil—the primary oil used in margarine, shortening, and salad and cooking oils—were tight in 1984 after the summer 1983 drought. Retail prices rose by more than 9 percent.

Because of smaller supplies of vegetable oils, consumption of animal fats increased 1.5 percent in 1984 as manufacturers turned to these cheaper substitutes. Animal fats account for approximately 25 percent of the fat used in shortening.

Per capita consumption of fats and oils rose an estimated 2 percent in 1985, with increased use of shortening, salad oils, and edible tallow. Supplies of most vegetable oils have rebounded from the 1983/84 drought-reduced levels. As a result, retail prices declined significantly between 1984 and 1985.

#### Fruit Consumption Shifts To Noncitrus

Fresh fruit consumption totaled 86.6 pounds per capita in 1984, down 1 percent from 1983. The decrease was mainly



Consumption of flour and cereal products has been increasing in recent years after declining dramatically from the levels set early in this century.

the result of smaller supplies of citrus fruit, down 17 percent from 1983's record level. Supplies of citrus were reduced because trees were heavily damaged by freezing temperatures in 1983. Retail citrus prices rose by more than 30 percent in 1984.

Consumers ate 6 percent more fresh noncitrus fruit, with significant gains in strawberries, peaches, and plums. This shift to noncitrus fruits has been a trend for the last decade. Fresh fruit consumption increased 13.6 percent between 1970-74 and 1984. While apples, oranges, and bananas still account for 60 percent of total fresh fruit sales, most of the increase was in minor fruits such as strawberries, nectarines, avocados, and grapes (figure 2). Improved marketing and greater off-season availability, as well as consumer demand for variety, have led to increases for these fruits (see *NFR-28*, page 6).

One of the greatest gainers has been strawberries. In 1984, consumption increased 27 percent to a 40-year high of 2.8 pounds per capita. Other fruits to gain in recent years were plums, nectarines, and grapes, with grapes up 52 percent since 1980. Avocados have been

increasing faster than any other fresh fruit, with per capita consumption up 250 percent since 1970-74. In 1984, consumption of avocados was 2.1 pounds, higher than that of cherries, nectarines, pineapples, or plums.

Smaller supplies for most major fruits led to slightly reduced consumption in 1985. Preliminary data show supplies of apples, pears, peaches, and citrus were 3-10 percent below 1984 levels. Fruits showing consumption gains included strawberries, grapes, and especially nectarines. Supplies of nectarines were up more than 9 percent from 1984 levels.

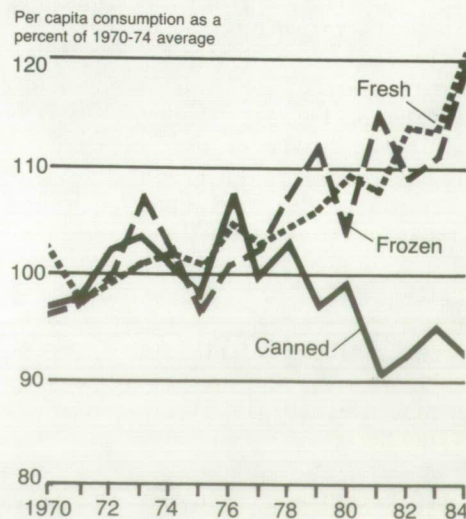
Another tree crop, nuts, also gained popularity, rising almost 30 percent since the early 1970's from 1.8 pounds to 2.2 pounds per capita in 1984. Almonds are the most popular nut, followed by walnuts and pecans. About 30 percent of nuts end up in candy, ice cream, and other products, while the remainder are sold directly, either shelled or unshelled. Nut consumption—especially pistachios—should continue to increase. The California pistachio industry has been expanding, and consumers can expect larger supplies and lower prices in the next few years.

### Vegetable Consumption Shows Large Gains

Total consumption of the eight major commercial fresh vegetables increased 6.3 percent in 1984, the largest rise in more than 20 years. The biggest gain was for tomatoes, which increased 18 percent over 1983 to 13.7 pounds per capita. Americans also ate more broccoli, carrots, cauliflower, celery, lettuce, and onions, while corn consumption did not change. Frozen vegetables (excluding potatoes) rose 8 percent in 1984 to 12 pounds per capita. In contrast, canned vegetables declined 3 percent.

Over the last 15 years, the trend in vegetable consumption has been toward fresh and frozen and away from canned, which is off 8 percent since the early 1970's. The only canned vegetable to remain strong is tomato products, which have increased 14 percent since 1970-74. Over the same period, fresh and frozen vegetables increased 21 and 20 percent, respectively (figure 3). Americans are willing to pay more for these products; since 1977, prices have risen 10 percent relative to canned.

Figure 3. Canned Vegetables Lose to Fresh and Frozen





Demand for fresh and frozen vegetables was strong in 1985. However, celery, carrot, and lettuce supplies were affected by hot weather in California, and consumption declined. Final data for 1985 should show significant gains of 3-5 percent per capita for broccoli, cauliflower, and tomatoes. Frozen vegetable consumption is also expected to increase in the next few years, with the largest gains for broccoli and corn.

### Consumption of Grains Trending Upward

Consumption of flour and cereal products has been increasing in recent years after declining dramatically from the levels set early in the century. In 1984, total per capita use of flour and cereal products was 149.2 pounds, compared with 139.4 pounds in 1970-74, 204 pounds in 1945-49, and 287 pounds in 1910-15.

Wheat flour represents about 80 percent of total flour and cereal product use. The average annual use of wheat flour for 1980-84 was 117.3 pounds per capita, up 5.7 percent from the average for 1970-74. One reason for the increase has been the rise in popularity of pasta products, up from 8.6 pounds per capita in 1970-74 to 12.3 pounds in 1984.

Consumption has increased for other cereal products as well. Use of corn meal rose 8.5 percent over the last 10 years to 6.6 pounds per capita in 1984. Rice consumption increased 19 percent over the same period, though it has declined in the last 2 years. In 1984, it was 8.6 pounds per capita. Rye, barley, oats, and hominy have declined since the mid-1960's.

Breakfast cereal has also been rising and is currently 12.2 pounds per capita. Average annual consumption of ready-to-eat cereal was 10.1 pounds per capita in 1980-82 (more recent data are not available), a 13-percent increase from the 1970-74 average of 8.9 pounds. Ready-to-cook cereal declined 13 percent over the same period.

### Sugar Consumption Continues To Rise

Despite weight consciousness and calorie counting, Americans increased

their intake of total caloric sweeteners by 3 percent in 1984 to 146.6 pounds per capita, an all-time high. All of this increase stemmed from an 18-percent rise in the use of high fructose corn syrup (HFCS), roughly two-thirds of which is used in soft drinks. Because of increased substitution of HFCS in processed products, refined sugar consumption declined 5 percent in 1984 to 67.5 pounds per capita, the lowest level on record. At the same time, corn sweetener consumption reached 77.3 pounds, the highest on record.

America's appetite for sweets does not appear to be decreasing. Final data for 1985 are expected to show another 1-percent increase in total caloric sweetener consumption as an 8.4-percent decline in refined sugar will be offset by a sharp 17.6-percent increase for HFCS.

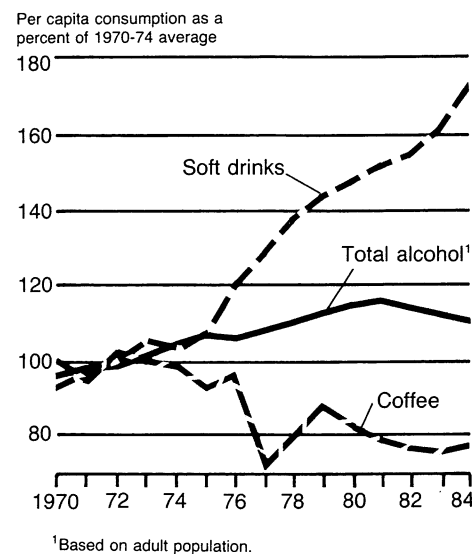
These large increases in HFCS are not expected to continue in 1986. HFCS is quickly reaching full market penetration for processing use, and further gains will depend on increases in the consumption of final products—primarily soft drinks. However, most of the future growth in soft drinks is expected to be in diet products.

The use of aspartame, a noncaloric sweetener marketed as Nutrasweet, reached 5.8 pounds per capita, sugar sweetness equivalent, in 1984. That's more than double the 2 pounds consumed in 1983. Saccharine use also jumped in 1984, up 5.3 percent to 10 pounds per capita. Aspartame should continue to increase at a high rate as more products are marketed containing this sugar substitute. Currently in development is a frozen dessert product with Nutrasweet.

### Alcohol Consumption Declining

Total alcohol consumption has leveled off in recent years, after increasing 16 percent between 1970-74 and 1981. Based on the adult population (21 years and over), per capita beer consumption fell in 1984 for the third consecutive year to 36.5 gallons per capita. Distilled spirits also declined. Wine is the only alcoholic

**Figure 4. Alcohol Levels Off, While Soft Drinks Continue To Rise**



beverage that continues to gain (figure 4), increasing 2.9 percent in 1984 to 3.4 gallons per adult. Consumption of wine coolers, a new beverage that combines citrus juice and wine, was 0.2 gallon per adult in 1984.

Soft drink consumption rose 7.5 percent in 1984 to 44.2 gallons per capita, the largest increase since the mid-1970's. Diet drinks increased from 18 to 20 percent of the total. Coffee drinking also increased for the first time since 1979, rising 2 percent to 25.8 gallons per capita.

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# Nutrient Content of the Food Supply

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The U.S. food supply in 1984 provided between 2 and 5 percent more iron, vitamin A, calcium, and vitamin B<sub>12</sub> than it did in 1983. Food energy (calories) and eleven other nutrients increased 1 percent or less (*table 1*). Only ascorbic acid saw a decline in 1984, falling 3 percent.

Compared with 1967-69 levels, the 1984 levels ranged from 1 to 17 percent higher for all nutrients except vitamin B<sub>12</sub>, which declined 4 percent, and cholesterol, which dropped 8 percent.

Nutrient levels of the U.S. food supply partly reflect changes in the market in response to shifts in consumer demand and factors affecting the availability of food. These include transitory factors such as unusual weather conditions or a specific event such as revised Federal enrichment standards. Longer term changes in nutrient levels may reflect substantial shifts in consumer eating habits and preferences.

The data in this article are based on per capita food consumption estimates but are not adjusted for loss or waste of food or nutrients during processing, marketing, or home use (*see sidebar box*). For this reason, the data measure the amount of food and nutrients available for consumption from the U.S. food supply, rather than the quantity of food or nutrients actually consumed by Americans.

## Changes in Nutrient Levels, 1983-1984

**Iron:** The 5-percent increase in iron primarily reflected the revised Federal standard for enrichment of white flour with this nutrient. Effective July 1, 1983, the standard for iron was increased from 13 to 20 milligrams (mg) per pound of flour. As a result, the grain products group, comprised largely of flour, accounted for 85 percent of the increase in iron between 1983 and 1984. Grain products were the leading source of iron after



A freeze-damaged orange crop was largely responsible for the 3-percent decline in the level of ascorbic acid in 1984's food supply.

1979 when they surpassed the meat, poultry, and fish group (*table 2*).

**Vitamin A:** Increased use of dark green and deep yellow vegetables, particularly good sources of vitamin A, accounted for over half of the 3-percent rise in 1984. Vegetables were the leading source of vitamin A, but dairy products, poultry, and spices also contributed to the higher vitamin A level.

**Calcium:** The 2-percent increase since 1983 reflected greater use of cheese, lowfat milk, and yogurt. Dairy products—the chief source of calcium—accounted for 85 percent of the gain.

(For more details on this nutrient, see the "Closeup" section later in this article.)

**Vitamin B<sub>12</sub>:** This nutrient occurs naturally only in foods of animal origin, but small amounts are added to grain products in the fortification of cereals. The 2-percent increase reflected a small rise in the use of some fish and shellfish, poultry, and dairy products. Although fish and shellfish account for a relatively small proportion of the meat, poultry, and fish group, they are more concentrated sources of vitamin B<sub>12</sub> than red meats (other than offal) and poultry.

**Ascorbic acid:** The decreased supply of citrus products in 1984 resulted in a 3-percent decline in the level of ascorbic acid. Use of fresh oranges, the citrus fruit used in largest quantities, declined

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from 15 to 12 pounds per capita following severe winter weather conditions. Citrus products were the largest single source of ascorbic acid among the food groups, providing 29 percent in 1983 and 26 percent in 1984. Vegetables, potatoes, and non-citrus fruits (in that order) were other important sources. The decrease in ascorbic acid from citrus products was only partially offset by small gains from other foods.

*Other nutrients:* The 1984 levels for food energy, fat, and thiamin were about the same as in 1983. Increases of roughly 1 percent occurred for protein, carbohydrate, phosphorus, magnesium, riboflavin, niacin, vitamin B<sub>6</sub>, zinc, and cholesterol. These changes were related to small increases in the use of dairy products, animal fats, poultry, corn syrups, and miscellaneous foods.

#### Changes Between 1967-69 and 1984

Major sources of most nutrients were the same in 1967-69 and 1984. However, leading sources shifted for three

nutrients—grain products replaced meat, poultry, and fish as the major source of iron; dark green and deep yellow vegetables replaced meat, poultry, and fish as a source of vitamin A; and citrus products replaced other vegetables as a source of ascorbic acid. In addition, changes occurred in the nutrient contributions of specific foods within the groups.

*Ascorbic acid:* Fruits and vegetables, excluding potatoes, accounted for the 17-percent increase in ascorbic acid from 1967-69 to 1984. Together, these two food groups provided roughly three-fourths of the ascorbic acid in the food supply during those 15 years, but changes occurred in use of specific foods within the groups. Increased use of citrus products, mainly frozen orange juice, accounted for about one-third of the total gain in ascorbic acid. Vegetables, particularly fresh, also contributed substantially to the higher level of ascorbic acid because of increased use of especially good sources such as cauliflower and broccoli. Fortification of fruit juices, fruit drinks,

and other miscellaneous foods with ascorbic acid also contributed to the increase. Ascorbic acid from such fortification doubled between 1967-69 and 1984.

#### Thiamin, Riboflavin, and Niacin:

Federal standards for enrichment of white flour with thiamin, riboflavin, and niacin became effective July 1, 1975. These higher standards and a 5-pound increase in per capita use of flour between 1967-69 and 1984 were largely responsible for the gains of 9 percent in the level of thiamin in the food supply, 5 percent for riboflavin, and 4 percent for niacin.

Grain products were the leading source of thiamin between 1967-69 and 1984, with their share increasing from 35 to 42 percent during the period. This increased contribution reflected, in part, a declining proportion from decreased use of meat and some dairy products. Use of meat declined about 5 pounds, while dairy product use fell 35 pounds (product weight). Per capita use of flour, the major component of the grain product group, was 118 pounds in 1984, up from 113 pounds in 1967-69.

The higher enrichment levels and greater use of grain products were also primarily responsible for the increased level of riboflavin between 1967-69 and 1984. The proportion of riboflavin from grain products increased from 18 percent in 1967-69 to 23 percent in 1984, while the share from dairy products declined from 37 to 35 percent, and that from the meat, poultry, and fish group fell from 23 to 22 percent. Among dairy products, the decrease in riboflavin from less use of whole milk offset the gain from use of more lowfat milk and cheese. The decline in riboflavin from use of less red meat was almost offset by the marked increase in use of poultry.

Most of the increase in niacin came from grain products and poultry. Grain products, primarily flour, provided 60 percent of the increase in niacin, compared with 38 percent provided by poultry. Poultry's share of niacin rose from

**Table 1. Nutrients Available for Consumption, Per Capita Per Day<sup>1</sup>**

Nutrient (unit)	1909-13	1967-69	1983	1984	Percent change <sup>2</sup>	
					1967-69 -1984	1983- 1984
Food energy (kcal)	3,450	3,270	3,440	3,450	5	—
Protein (gm)	99	98	101	102	4	1
Fat (gm)	124	157	166	166	6	—
Carbohydrate (gm)	488	375	395	399	6	1
Calcium (mg)	759	902	907	924	2	2
Phosphorus (mg)	1,506	1,500	1,520	1,541	3	1
Magnesium (mg)	392	329	335	340	3	1
Iron (mg)	15.0	16.7	18.0	18.8	12	5
Zinc (mg)	12.9	12.1	12.2	12.3	1	1
Vitamin A value (IU)	8,200	7,700	8,000	8,200	6	3
Thiamin (mg)	1.65	1.98	2.16	2.16	9	—
Riboflavin (mg)	1.79	2.27	2.35	2.38	5	1
Niacin, preformed (mg)	18.8	23.4	26.2	26.6	14	1
Vitamin B <sub>6</sub> (mg)	2.15	1.92	2.01	2.03	6	1
Vitamin B <sub>12</sub> (mcg)	7.9	9.2	8.6	8.8	-4	2
Ascorbic acid (mg)	98	100	120	116	17	-3
Cholesterol (mg)	502	524	478	481	-8	1

<sup>1</sup>Quantities of nutrients are computed by the Human Nutrition Information Service (HNIS), USDA, on the basis of estimates of per capita food consumption (retail weight) prepared by the Economic Research Service. Includes HNIS estimates of produce from home gardens. No deductions are made in estimates for loss of food in processing, marketing, or in the home, use for pet food, or for loss of nutrients during the preparation of food. Data include iron, thiamin, riboflavin, niacin, vitamin A value, vitamin B<sub>6</sub>, vitamin B<sub>12</sub>, and ascorbic acid added in enrichment and fortification. <sup>2</sup>Percentages are based on aggregate data.

10 to 14 percent because of the rise in per capita use from 46 pounds in 1967-69 to 68 pounds in 1984.

*Iron:* A 12-percent rise in the iron level between 1967-69 and 1984 was also attributed to increased use of grain products and the 1983 revision in the Federal standard for enrichment of white flour

with iron. Grain products were the leading source of iron in 1984, providing 36 percent of the total, up from 30 percent in 1967-69. The meat, poultry, and fish group provided a smaller proportion of iron in 1984 because of less use of red meat. Poultry, although not as concentrated a source of iron as red meat, pro-

vided a little more iron in 1984 than in 1967-69 because of the substantial increase in use.

*Vitamin A:* The 6-percent increase for vitamin A between 1967-69 and 1984 was attributed primarily to use of more dark green and deep yellow vegetables. These foods accounted for 24 percent of the vi-

**Table 2. Contribution of Major Food Groups to Nutrient Levels**

Food group	Food energy	Protein	Fat	Carbohydrate	Calcium	Phosphorus	Magnesium	Iron	Zinc	Vitamin A value	Thiamin	Riboflavin	Niacin	Vitamin B <sub>6</sub>	Vitamin B <sub>12</sub>	Ascorbic acid	Cholesterol
Percent																	
<b>1967-69</b>																	
Meat, poultry, and fish	21.6	42.4	37.3	0.1	4.0	27.5	13.6	31.7	47.9	23.2	30.0	23.3	48.1	40.7	71.3	2.1	35.1
Eggs	2.1	5.4	3.1	0.1	2.7	5.3	1.6	5.4	5.2	2.9	1.9	5.8	0.1	2.7	7.4	0.0	45.7
Dairy products, excluding butter	10.9	21.0	12.4	6.7	76.1	35.9	20.4	2.2	18.8	11.9	11.5	37.4	2.0	11.6	20.1	4.4	13.7
Fats and oils, including butter	17.1	0.2	40.2	<sup>1</sup>	0.2	0.1	<sup>1</sup>	0.1	0.1	8.4	<sup>1</sup>	0.1	<sup>1</sup>	<sup>1</sup>	0.0	0.0	5.5
Citrus fruits	0.8	0.4	0.1	1.7	0.9	0.6	2.0	0.8	0.4	1.2	2.3	0.4	0.7	1.3	0.0	24.9	0.0
Noncitrus fruits	2.2	0.6	0.2	4.9	1.2	1.2	4.1	3.7	0.9	6.2	1.8	1.6	1.8	6.6	0.0	13.0	0.0
Potatoes and sweet potatoes	3.0	2.5	0.1	5.6	1.1	3.8	7.8	4.5	3.4	7.4	5.1	1.7	6.9	11.4	0.0	18.1	0.0
Dark-green, deep-yellow vegetables	0.2	0.3	<sup>1</sup>	0.4	1.1	0.5	1.7	1.3	0.4	20.7	0.7	0.7	0.5	1.6	0.0	8.0	0.0
Other vegetables, including tomatoes	2.0	2.7	0.3	3.9	4.2	4.1	8.8	8.1	3.7	11.7	5.6	4.0	4.7	9.2	0.0	26.7	0.0
Dry beans and peas, nuts, soy products	2.9	5.1	3.5	2.1	2.7	5.8	11.4	6.6	4.3	<sup>1</sup>	5.2	1.8	6.6	4.8	0.0	<sup>1</sup>	0.0
Grain products	19.9	18.6	1.4	36.5	3.6	12.9	19.0	29.6	12.3	0.4	35.3	17.7	23.6	9.8	1.2	0.0	0.0
Sugar and other sweeteners	16.4	<sup>1</sup>	0.0	37.1	0.3	0.1	0.3	0.9	0.1	0.0	<sup>1</sup>	0.1	<sup>1</sup>	0.1	0.0	<sup>1</sup>	0.0
Miscellaneous <sup>1</sup>	0.8	0.7	1.5	0.7	2.1	2.3	9.2	5.0	2.3	6.0	0.4	5.4	5.0	0.1	0.0	2.8	0.0
<b>1984</b>																	
Meat, poultry, and fish	20.3	42.9	34.2	0.1	4.1	27.5	13.9	28.2	47.1	20.8	25.9	22.1	45.6	40.3	71.9	2.0	39.8
Eggs	1.6	4.3	2.4	0.1	2.2	4.2	1.3	4.0	4.2	2.3	1.5	4.6	0.1	2.1	6.4	0.0	41.1
Dairy products, excluding butter	10.3	20.9	11.7	6.0	75.8	35.8	19.1	2.3	19.7	11.6	8.9	34.7	1.6	11.5	20.1	3.1	14.0
Fats and oils, including butter	18.7	0.2	44.0	<sup>1</sup>	0.2	0.1	<sup>1</sup>	0.1	0.1	7.5	<sup>1</sup>	0.1	<sup>1</sup>	<sup>1</sup>	0.0	0.0	5.1
Citrus fruits	0.9	0.5	0.1	1.9	0.9	0.7	2.2	0.7	0.5	1.5	2.7	0.5	0.8	1.3	0.0	26.2	0.0
Noncitrus fruits	2.3	0.7	0.4	4.9	1.4	1.3	4.6	3.7	1.0	5.5	1.9	1.8	1.8	7.5	0.0	13.2	0.0
Potatoes and sweet potatoes	3.1	2.6	0.1	5.8	1.1	4.0	8.0	4.7	3.4	5.3	5.2	1.6	6.7	10.9	0.0	16.0	0.0
Dark-green, deep-yellow vegetables	0.2	0.4	<sup>1</sup>	0.5	1.4	0.7	2.0	1.4	0.5	24.0	0.8	1.0	0.6	2.1	0.0	10.9	0.0
Other vegetables, including tomatoes	1.9	2.6	0.2	3.7	4.1	4.0	8.5	7.2	3.5	12.0	5.2	3.9	4.3	9.0	0.0	24.1	0.0
Dry beans and peas, nuts, soy products	3.1	5.7	3.8	2.1	3.1	6.4	12.7	6.6	5.0	<sup>1</sup>	5.4	2.1	6.7	5.1	0.0	<sup>1</sup>	0.0
Grain products	19.5	18.4	1.3	35.5	3.6	12.7	18.4	35.7	12.3	0.3	41.9	23.0	27.9	10.1	1.7	0.0	0.0
Sugar and other sweeteners	16.9	<sup>1</sup>	0.0	38.6	0.3	0.1	0.3	0.7	0.1	0.0	<sup>1</sup>	0.4	<sup>1</sup>	<sup>1</sup>	0.0	<sup>1</sup>	0.0
Miscellaneous <sup>2</sup>	1.0	0.9	1.7	0.8	1.8	2.5	8.9	4.7	2.7	9.1	0.5	4.3	3.9	0.1	0.0	4.4	0.0

<sup>1</sup>Less than 0.05 percent. <sup>2</sup>Includes coffee, tea, chocolate liquor equivalent of cocoa beans, spices, and fortification of products not assigned to a food group.



## Developing the Data

USDA's Human Nutrition Information Service (HNIS) annually compiles data on the nutrient content of the U.S. food supply, estimating per capita per day food energy and nutrients in foods available for consumption. Additionally, HNIS estimates the percentage contribution of each nutrient provided by the 13 major food groups. The historical series dates from 1909.

HNIS researchers derive their estimates by using data on foods available for consumption from USDA's Economic Research Service (ERS) and information on the nutrient

composition of foods. ERS determines the amount of food available by subtracting data on exports, year-end inventories, nonfood use, and military procurement from total production, imports, and beginning inventories. However, subsequent food losses during processing, marketing, and home use are not considered. Therefore, quantities of food available for consumption include a larger amount than is actually eaten. To make this distinction clear in the article, food available for consumption is referred to as "use" rather than consumption.

tamin A in 1984, compared with 21 percent in 1967-69. At that time, the meat, poultry, and fish group was the chief source, providing 23 percent. The increase from dark green and deep yellow vegetables more than offset the sizable decline in vitamin A from the meat group, primarily from less use of edible offal. Offal, which includes organ meats such as liver, is used in the manufacture of luncheon meats and is a concentrated source of vitamin A. Sweetpotatoes, also a concentrated source of vitamin A, provided less of this vitamin because of decreased use.

**Vitamin B<sub>6</sub>:** The vitamin B<sub>6</sub> level rose 6 percent, primarily from the large increase in use of poultry. This increase and smaller gains from fruits, vegetables, dairy, and grain products more than offset the small decline from use of less red meat.

**Magnesium and phosphorus:** Magnesium and phosphorus levels each rose 3 percent between 1967-69 and 1984. Greater use of lowfat milk, cheese, poultry, nuts, and noncitrus fruits accounted for the rise in magnesium and more than compensated for the decline resulting from less use of whole milk and meats. Greater use of poultry, lowfat milk, and

cheese accounted for the increase in phosphorus. Increased use of nuts, mostly peanuts, also contributed to the gain because of their high phosphorus content.

**Calcium:** This nutrient, provided mainly by dairy products, increased 2 percent between 1967-69 and 1984 because of the marked gain in use of lowfat milk and cheese. Despite its declining contribution, whole milk remains the leading source of calcium among the dairy products, with cheese a close second. Although dairy products accounted for roughly two-thirds of the gain in calcium, other food groups also contributed.

**Zinc:** The 1-percent increase in zinc between 1967-69 and 1984 reflected gains from poultry and some other foods. These gains were almost offset by the decline from red meats.

**Vitamin B<sub>12</sub> and cholesterol:** Between 1967-69 and 1984, the level for vitamin B<sub>12</sub> declined 4 percent and cholesterol 8 percent. The decline in per capita use of eggs from 306 to 253 was chiefly responsible for the lower level of cholesterol. In addition, small declines in cholesterol also resulted from decreased use of butter and lard. A decline in the use of eggs and

meats (largely offal, a concentrated source of vitamin B<sub>12</sub>) was responsible for the lower level of vitamin B<sub>12</sub>.

**Food energy:** The level of food energy in the food supply is determined by amounts of the three energy-yielding nutrients—protein, fat, and carbohydrate. Fat provides more than twice as many calories per gram than either protein or carbohydrate. The 5-percent increase in food energy between 1967-69 and 1984 resulted from a 4-percent rise in protein and 6-percent gains for fat and carbohydrate.

The higher fat level resulted from increased per capita use of shortening from 16.4 to 21.3 pounds and edible oils from 15.9 to 21.1 pounds. The increase in carbohydrate was attributed primarily to greater use of corn syrups. Use of high fructose corn syrup (HFCS), which was first reported in the late 1960's, increased dramatically, rising from 1.0 pound in 1970 to 51.1 pounds per capita in 1984. Soft drinks accounted for over two-thirds of the total use of HFCS in 1984. Almost 90 percent of the total gain in the protein level was attributed to increased use of poultry.

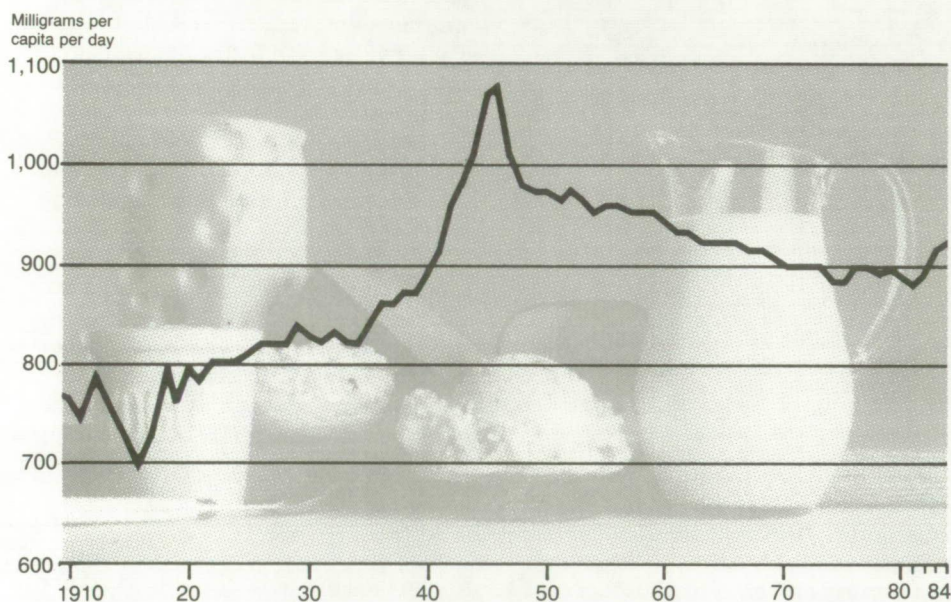
## Closeup on Calcium

Calcium is an essential mineral used to build bones and teeth and to maintain bone strength. It is also necessary for muscle contraction, blood clotting, and the maintenance of all cell membranes. Osteoporosis, a condition in which bone mass is decreased, may be related to a long-term low calcium intake. However, several other factors such as age, sex, body weight, hormone use, and physical activity also influence the development of this bone disorder. Osteoporosis is most common among elderly white females.

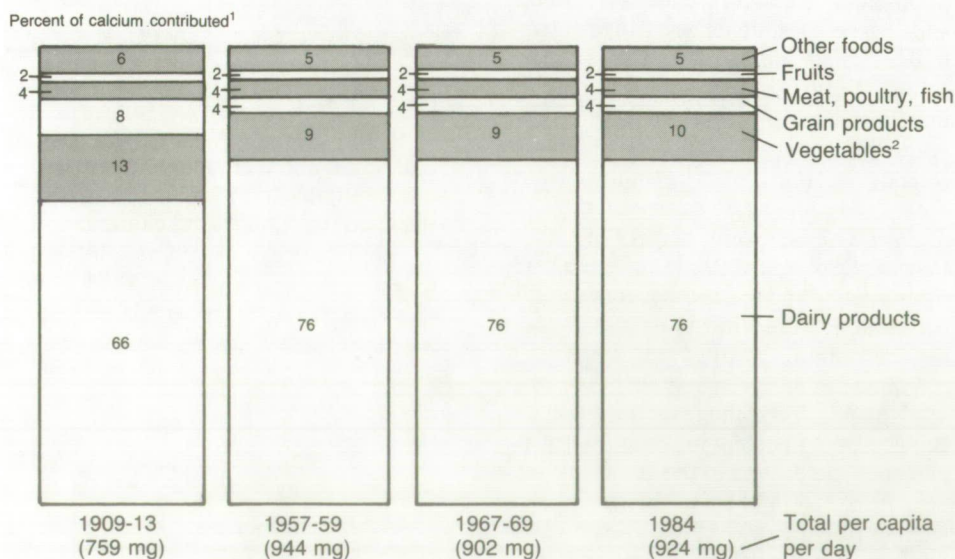
The Recommended Dietary Allowance (RDA) for calcium is 800 mg per day for adults and young children and 1,200 mg per day for adolescents. The calcium level of the U.S. food supply was 924 mg

## Calcium in the U.S. Food Supply

**Figure 1A. Calcium Levels Reached a Peak in the Mid-1940's**



**Figure 1B. Dairy Products Are the Largest Source of Calcium in the Food Supply**



<sup>1</sup>Components may not add exactly to 100% due to rounding.

<sup>2</sup>Vegetables, potatoes, and dried beans, peas, nuts, and soy products.

per capita per day in 1984, higher than the 759 mg in 1909-13 but lower than the peak of 1,075 mg in 1946 (*figure 1A*).

Although the per capita level of calcium in the food supply in 1984 appears to be sufficient since it is near RDA levels, such a conclusion may be erroneous for several reasons. First, estimates of nutrients in the food supply may overstate actual intake because they are based on foods available for consumption, rather than on what is actually eaten. These estimates don't account for nutrient losses which occur in processing, marketing, or home use. The RDA's, in contrast, indicate the amounts of nutrients to be obtained from foods actually ingested.

Second, estimates of per capita nutrient levels in the food supply do not take into consideration differences in the distribution of food among individuals in the population. Food is not distributed equally among individuals, nor is it necessarily distributed on the basis of nutritional need.

USDA's Nationwide Food Consumption Survey, 1977-78, and Continuing Survey of Food Intake by Individuals, 1985, measured calcium as ingested by individuals. Findings indicate that average calcium intakes were below the RDA for several sex and age categories. For example, in a national sample in 1985, women 19 to 50 years old had average intakes of 78 percent of the RDA.

### Calcium from Dairy Products Increased

The amount of calcium from dairy products increased from 503 to 700 mg per capita per day between 1909-13 and 1984. The proportion of the total calcium in the food supply provided by dairy products also rose from 66 to 76 percent (*figure 1B*). Because such a large proportion of calcium is provided by dairy products, the calcium level in the food supply closely followed trends in use of these foods. The dairy product group has six categories—whole milk, skim and lowfat milk and yogurt, cream, cheese, canned and dry milk and whey, and frozen desserts.



Among the dairy products, whole milk was the leading source of calcium throughout the century. However, the contribution of calcium from whole milk declined from 65 percent in 1909-13 to 57 percent in 1957-59 and to only 28 percent in 1984 (*figure 2A*). Use of whole milk peaked at 342 pounds per capita in 1945 and declined to its lowest level of 125 pounds in 1984. Reasons for decreased use of whole milk include a declining proportion of young children in the population, substitution of lowfat and skim milk for whole milk, and increased use of other beverages such as soft drinks.

In contrast, the category comprised of skim, plain and flavored lowfat milk, buttermilk, and yogurt contributed 23 percent of the calcium from dairy products in 1984, compared with 19 percent in 1909-13 and only 5 percent in 1957-59. Use of products in this category declined throughout the first half of the century to a record low of 24.3 pounds per capita in 1958. However, use increased substantially over the last 25 years, reaching 106.5 pounds in 1984. This upward trend was probably related to increased consumer interest in avoiding excess calories and fat in the diet.

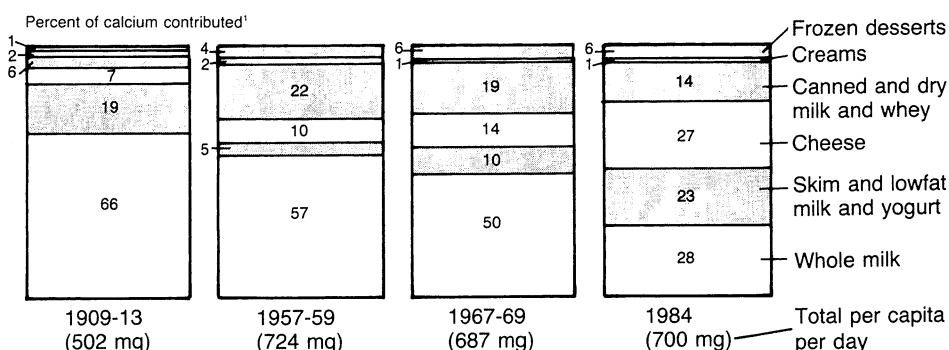
Skim milk made the largest contribution to calcium from this category in 1954, providing 61 percent of the total calcium coming from the skim and lowfat milk and yogurt group. By 1984, the share from skim milk had declined to only 12 percent (*figure 2B*). Data on use of specific types of skim and lowfat milk and yogurt are available only since 1954.

The percentage of calcium from buttermilk declined over the past 30 years, providing only 4 percent in 1984 compared with 28 percent in 1954. Despite a small increase in use of flavored lowfat milk between 1954 and 1984, the proportion of calcium provided declined by half to 5 percent in 1984 because of larger increases in use of other foods.

In 1984, 1- and 2-percent lowfat milk was the major source of calcium providing 75 percent of the total from the skim and lowfat category compared with 1 percent

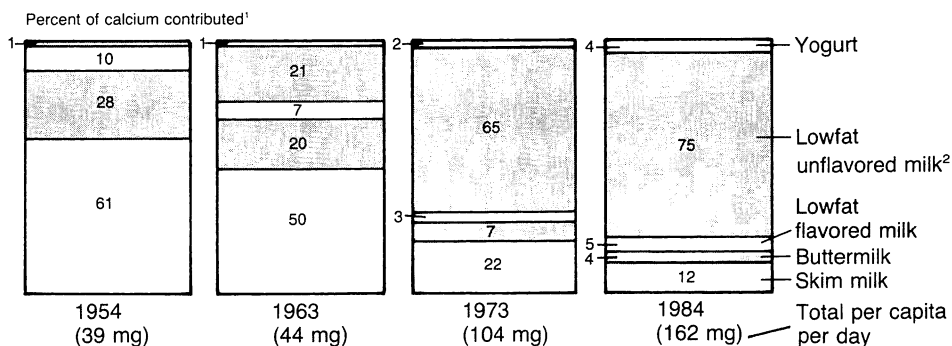
## Calcium in Dairy Products

**Figure 2A. Whole Milk Now Supplies Less Than 30% of the Calcium Provided by Dairy Products**



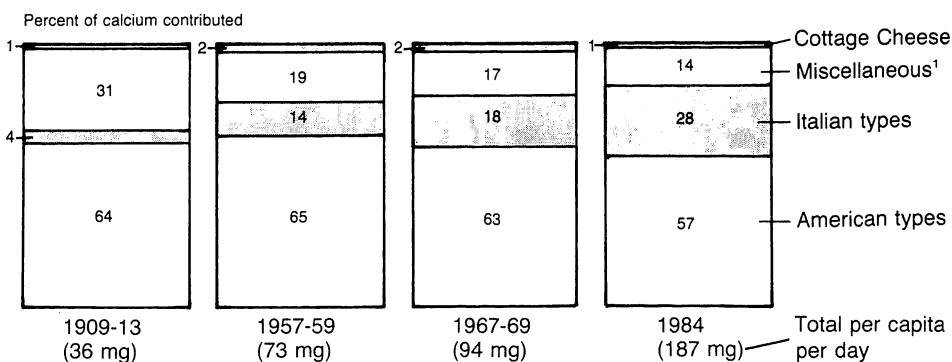
<sup>1</sup>Components may not add exactly to 100% due to rounding.

**Figure 2B. Lowfat Replaces Skim as the Major Calcium Source in the Skim, Lowfat, and Yogurt Group**



<sup>1</sup>Components may not add exactly to 100% due to rounding. <sup>2</sup>One and two-percent lowfat milk.

**Figure 2C. American Types Still Dominate the Cheese Category**



<sup>1</sup>Swiss, brick, muenster, cream, blue, brie, edam, gouda, feta, and tilsit.



Calcium from cheese doubled between the late 1960's and 1984.

cent in 1954. This increase reflects the dramatic rise in consumption of lowfat milk from less than 1 pound per capita in 1954 to 80.3 pounds in 1984. The proportion of calcium supplied by yogurt in the skim and lowfat milk category also increased from 1 percent in 1963 to 4 percent in 1984. Since 1971, use of yogurt tripled to 3.5 pounds per capita.

Cheese provided a little more than one-fourth of the calcium from dairy products in 1984, ranking second to whole milk. The share of calcium from dairy products provided by cheese almost doubled between 1967-69 and 1984. Use of American-type cheese more than doubled over the period and in 1984 was the major source of calcium from the cheese group. However, the proportion of cal-

cium that American-type cheese supplied declined from 65 percent in 1957-59 to 57 percent in 1984 (*figure 2C*). In contrast, use of Italian-type cheese, primarily mozzarella for pizza, increased from less than 1 pound per capita in 1957-59 to 5.8 pounds in 1984, and the share of calcium from Italian cheese doubled from 14 to 28 percent. Calcium from miscellaneous cheeses declined steadily throughout the years, providing 31 percent in 1909-13 and 14 percent in 1984. Cottage cheese consistently provided 1 to 2 percent of the calcium from all cheese.

Canned and dry milk and whey provided 14 percent of the calcium from dairy products in 1984, down from 22 percent in 1957-59, mainly reflecting the decline in use of nonfat dry milk after the

early 1960's. Nonfat dry milk provided less than half as much calcium in 1984 as in 1960. In contrast, the amount of calcium from dry whey, an economical substitute for nonfat dry milk in processed foods, more than tripled between 1970 and 1984.

The desserts category includes ice cream and other frozen milk-based desserts. Calcium in the dairy product group provided by these foods increased from 1 to 6 percent between 1909-13 and 1967-69. In contrast, during that period the proportion of calcium from creams decreased from 2 to 1 percent. However, after 1967-69, little change occurred in the proportions from either frozen desserts or cream.

#### Other Foods Also Provide Calcium

Although the dairy products group is the main source of calcium in the U.S. food supply, other foods also contribute. Vegetables (including potatoes and sweetpotatoes) and dry beans, peas, nuts, and soy products together provided the largest proportion of calcium from non-dairy foods. However, their proportionate contribution declined during the century primarily because of decreased use of potatoes, dry beans, and peas. Greater use of dark green and deep yellow vegetables, tomatoes, peanuts, and soy products offset some of the decline.

The proportion of calcium from grain products was halved from 8 percent to 4 percent between 1909-13 and 1957-59 and remained at about this level. Meat, poultry, and fish provided about 4 percent and fruits about 2 percent of the calcium in the food supply throughout the years. Eggs, fats and oils, sugar and sweeteners, and miscellaneous products such as coffee, tea, cocoa, and spices provided 5 or 6 percent of the calcium since 1909-13. □



# Food Prices Post Small Rise

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Retail food prices rose only 2.3 percent in 1985, the second smallest increase in 18 years. A decline in the farm value of food helped slow the increase in retail food prices. Grocery store food prices were up an average of less than 1.4 percent from 1984, while the cost of meals sold in restaurants and fast food establishments rose 4 percent (*table 1*).

A 5.3-percent increase in the farm-to-retail spread was the main reason for last year's rise in retail food prices. This spread is the difference between farm value and retail price, and it represents what the food industries charge for processing raw farm products into finished foods and transporting and distributing them to consumers.

Increases in the spread usually occur as rising costs for labor and other inputs used by the food industry are passed on to consumers through higher retail food prices. Compared with many past years, however, the 1985 rise in food marketing costs was very modest. It was held in check mostly because the food industry's hourly labor costs were unchanged, compared with increases of about 3 percent in 1984 and 4 percent in 1983. Thus, the 1985 increase in the farm-to-retail spread only partly reflected higher food marketing costs; it also reflected lags by the food industry in passing the farm value declines through to retail prices. While the wider spread in 1985 suggests some recovery in food industry profits following the recession of the early 1980's, greater amounts of advertising and promotion boosted operating costs of some firms and held down profit margins to near 1984 levels.

Consumer demand for foods remained strong in 1985, a carryover from 1984. In 1984, a rise in the rate of growth in the general economy and a 5.8-percent increase (after adjusting for inflation) in

disposable personal income contributed to increases in food demand. In 1985, disposable personal income increased less than 2 percent, and the unemployment rate fell to 7.2 percent, down slightly from 1984's 7.5 percent.

## Farm Share Declines for Most Foods

The farm value of food, that part of the consumer's food dollar that goes to farmers, dropped 6.9 percent in 1985. Large supplies of many commodities, particularly beef, pork, and poultry, depressed

farm prices and held down increases in retail prices.

Crop and livestock production, which climbed sharply in 1984, was up again last year. Soybean production, for example, rose about 14 percent, resulting in large supplies and lower oilseed prices despite strong demand for vegetable oils. The farm value of vegetable oil products dropped 16 percent. The farm value of crop products as a whole fell 5 percent.

Large supplies of meat and poultry depressed producer prices for cattle and

**Table 1. Tracking the Food Price Index**

Year	All food	Food at home			Food away from home	CPI <sup>2</sup> all items
		Total	Domestically produced farm food	Nonfarm food <sup>1</sup>		
Percentage change						
1960	1.0	0.9	0.5	—	2.6	1.6
1961	1.3	.9	.3	—	2.2	1.0
1962	.9	.7	1.0	—	2.6	1.1
1963	1.4	1.3	−.2	—	2.2	1.2
1964	1.3	1.1	.2	—	1.8	1.3
1965	2.2	2.5	2.8	—	2.2	1.7
1966	5.0	5.0	5.3	—	4.6	2.9
1967	.9	−.3	−1.0	—	5.2	2.9
1968	3.6	3.2	3.6	0	5.2	4.2
1969	5.1	4.8	5.3	.9	6.1	5.4
1970	5.5	5.1	4.2	12.7	7.4	5.9
1971	3.0	2.4	1.8	7.2	5.2	4.3
1972	4.3	4.5	4.8	1.7	4.0	3.3
1973	14.5	16.3	17.3	8.9	7.9	6.2
1974	14.4	14.9	13.8	23.8	12.7	11.0
1975	8.5	8.3	7.2	16.7	9.3	9.1
1976	3.1	2.1	1.0	9.8	6.8	5.8
1977	6.3	6.0	2.2	31.3	7.6	6.5
1978	10.0	10.5	11.3	7.4	9.0	7.7
1979	10.9	10.8	11.7	6.6	11.2	11.3
1980	8.6	8.0	7.2	11.7	9.9	13.5
1981	7.9	7.3	7.7	5.8	9.0	10.4
1982	4.0	3.4	3.6	2.7	5.3	6.1
1983	2.1	1.1	.9	1.9	4.4	3.2
1984	3.8	3.7	3.9	2.6	4.2	4.3
1985	2.3	1.4	1.2	2.6	4.0	3.6

— = Not available

<sup>1</sup>Includes soft drinks, coffee, and other nonalcoholic beverages, fish and seafood, candy and chewing gum, imported sugar, seasonings, and bananas. Data were estimated for 1968 through 1978 based upon the relative importance of these foods in the total food-at-home index and the price changes for domestic food and food at home. <sup>2</sup>Consumer Price Index, all urban consumers.

*The authors are agricultural economists with the Food Marketing and Consumption Economics Branch of the National Economics Division.*

hogs. Red meat's farm value, which accounts for about two-fifths of the total farm value of USDA's market basket of foods, averaged 8 percent lower.

Poultry producers increased production last year in response to lower feed prices and expectations of better returns. Farm value fell 6 percent for poultry. Egg and fresh vegetable supplies remained near 1984 levels but their farm prices fell, also contributing significantly to the overall drop in farm value.

Research indicates that it requires an average of 3 months or longer for the full effect of price changes at the farm level to be reflected at retail. The actual adjustment period varies by commodity, the amount of processing, and stock levels. Partly because of the time lag required for price changes to pass through the marketing system, lower farm prices for some foods in 1985 were not fully reflected at the retail level.

Cattle prices, for example, declined more than retail beef prices in 1985. Heavier slaughter weights of cattle caused larger beef supplies and lower fed cattle prices. Meat packers also discounted prices paid for heavier cattle to reflect the additional cost of more trimming and other handling activities.

Not all commodities saw lower farm values in 1985. Smaller supplies raised prices for processed fruits and vegetables.

Last year's farm value decrease followed 1984's 5.4-percent rise—the largest increase since 1979. A relatively stable farm value since 1980 has slowed the rise in retail food prices (*figure 1*). Retail food prices in grocery stores rose 21.7 percent from 1980 through 1985, less than the 30.5-percent increase for all items in the Consumer Price Index (CPI).

In 1981, very large crop production and expanding meat supplies limited the rise in farm value to under 3 percent. As a result, retail food prices went up much less than inflation. In 1982, crop harvests were large again. While meat production declined slightly, there was virtually no

increase in the farm value because domestic and foreign demand for agricultural commodities was weaker during the long recession. In 1983, the farm value declined because of a substantial increase in livestock production, particularly hogs, and continued large supplies and weak demand for most food commodities.

The farm value of food has not kept pace with prices paid by farmers for production items. Since 1980, the farm value has declined about 1 percent, compared with an increase of 14 percent in the cost of production inputs, a disparity that has contributed to depressed farm income during the past several years.

For most foods, farm value makes up a relatively small part of the retail price. The farm value as a share of the retail price varies depending on the inputs used and the complexities of the marketing process. In general, animal products have the highest ratios of farm value to retail prices, and the more highly processed crop products have the lowest. Last year, the farm value share of the retail price for major foods ranged from 10 per-

cent for cereal and bakery products to 60 percent for eggs.

The farmer's share of the consumer food dollar averaged 31 cents last year, down from 34 cents in 1984. Farm value's share of the retail cost of food has trended down gradually since the mid-1940's, when it was nearly 50 percent.

### Larger Share Goes for Marketing

The difference between farm value and the retail price, called the farm-to-retail spread, increased 5.3 percent in 1985. This is the largest rise in 3 years. The farm-to-retail spread represents all processing, transporting, and retailing charges added to the value of farm products after they leave the farm.

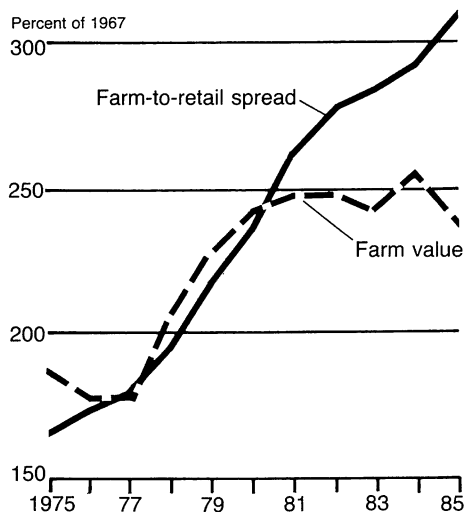
A wider spread may at least partially reflect rising costs faced by food industry firms, including wages of workers and prices of the many inputs bought from other parts of the economy.

USDA's Food Marketing Cost Index (FMCI) measures price changes in the factors affecting the farm-to-retail spread, such as labor, energy, packaging, and transportation. The FMCI rose less than



Lower prices of many commodities, including fresh vegetables, contributed to the overall drop in farm value.



**Figure 1. Food Marketing Charges Outpace Farm Value**

Farm value represents prices received by farmers for commodities equivalent to a fixed market basket of foods. Price spread is the difference between farm value and retail cost of the market basket and represents all charges for processing and distribution.

1 percent in 1985, compared with 4.2 percent in 1984 and 2.8 percent in 1983 (table 2).

The small rise in the FMCI was mainly the result of unchanged average hourly labor costs. Labor costs, consisting of hourly earnings of production and nonsupervisory workers and employee benefits, represent almost half of the FMCI. The next largest input, containers and packaging, is only about one-third as large, comprising about 15 percent of the marketing cost index.

For the food retailing sector of the industry, the labor cost index actually fell by about 3.5 percent in 1985. The decline resulted in large part because of the weakness of the labor market. Several other factors have also moderated retailing labor costs, including the trend in recent years toward "multi-tiered" labor contracts that pay new workers significantly less than existing employees. For instance, newly hired clerks may earn a

starting wage of \$5 per hour and be able to advance to \$8.50. In contrast, existing workers may have been hired at \$6.50 per hour and can earn as much as \$11.

Many of the union contract settlements in the past 2 years did not provide for any wage increase during the first year of the contract, and only small increases were negotiated for the ensuing years. Moreover, there have been reductions in several areas, including overtime pay rates, cost-of-living adjustments, and holiday and sick day benefits. Lump-sum payments have been granted to some workers in lieu of wage increases to eliminate the added cost of some benefits that are based on wage rates. Some companies have closed stores that were paying union wages and while many of these stores were reopened, worker pay scales were lower.

Labor costs for food wholesaling rose 3.4 percent in 1985, compared with 5.1 percent a year earlier. In food manufacturing, labor costs averaged 2.2 percent higher last year. This increase was only about half as large as in 1984.

In total, labor costs for food are likely

to rise only moderately in 1986, helping to hold down the increase in food prices. The multi-tiered pay scale will continue to temper labor costs in food retailing, while the same economic environment that has prevailed for several years is likely to continue. Inflation should remain at 3.5 to 4.0 percent, curtailing wage increases. Concern among workers over job security and continued unemployment in the economy will also dampen worker demands for wage increases.

#### Packaging Costs Increased in 1985

The price of packaging and container materials used by the food industry averaged 0.2 percent higher in 1985 than a year earlier, reflecting a 4.3-percent rise in the price of tin cans and a 5.3-percent increase for glass. Most affected were companies manufacturing canned fruits and vegetables, fish products, and soft drinks.

Prices of tin and glass containers in 1986 are likely to rise at close to last year's rate. Increases in steel prices, along with labor cost pressures, will mainly determine price increases for tin cans. Prices for glass containers are

**Table 2. Measuring Price Changes in Food Marketing Inputs<sup>1</sup>**

Cost Item	1980	1981	1982	1983	1984	1985 <sup>2</sup>
Annual percentage change						
Labor <sup>3</sup>	10.1	9.8	6.7	4.1	2.9	0
Packaging materials	14.4	7.5	-2.0	2.0	9.6	0.2
Paperboard boxes and containers	16.1	10.0	-1.3	-1.5	12.0	-2.2
Metal cans	11.2	6.2	5.1	2.9	6.1	4.3
Transportation	18.5	16.1	7.3	.9	4.4	.8
Fuels and electricity	34.9	18.7	5.4	0	1.1	-1.8
Electricity	18.4	14.9	10.4	2.9	5.3	3.1
Petroleum	48.1	24.1	-4.1	-11.5	-1.7	-6.7
Natural gas	34.7	12.6	19.8	16.6	.7	-0.6
Maintenance and repair	11.0	9.7	6.9	4.0	3.6	2.8
Supplies	15.4	9.7	1.9	-.9	.6	-0.2
Interest, short term	12.6	20.2	-19.5	-25.2	14.0	-20.8
Total marketing cost index (FMCI)	13.5	10.9	5.1	2.8	4.2	0.6

<sup>1</sup>Data measure changes in prices for fixed quantities of labor and other inputs used in processing, wholesaling, and retailing farm foods sold through foodstores. <sup>2</sup>Preliminary. <sup>3</sup>Hourly earnings and benefits.

## Understanding Food Price Changes

USDA uses a fixed set of foods representing consumer purchases to track changes in the prices of domestically produced foods sold in grocery stores. These market basket data account for about 82 percent of food at home, with prices for fish, nonalcoholic beverages, and imported products making up the remainder.

The cost of the market basket is divided into two components—the farm value and the farm-to-retail spread, which accounts for all charges for processing and distributing foods to consumers, including profits to the food industry.

The farm value of food is determined by the prices farmers receive for commodities and reflects supplies. ERS analysts calculate it by multiplying farm prices by the quantities of farm products equivalent to foods sold at retail. An allowance is made if byproducts are obtained in processing. The farm value is based on the quantity equivalent to a retail unit. Thus, the farm value is computed from a larger quantity than the retail unit because the foods farmers produce lose some weight in storage, processing, and distribution.

The farm product equivalent varies among foods. Only a slight amount of raw milk is lost, for example, as it is handled and processed for sale in cartons to consumers. Therefore, the price that milk producers receive per half-gallon at the farm is a little less than the farm value of the retail price per half-gallon at the store. In contrast, nearly 2.4 pounds of live animal

are needed to yield 1 pound of Choice beef at the meat counter. The payment the cattle producer receives for that larger quantity of live animal is the farm value in the price of 1 pound of retail beef.

The second component of food price change, the farm-to-retail spread, is more closely related to the inflation rate and prices of inputs used in food processing and distribution, such as labor, energy, and transportation.

USDA's Economic Research Service developed a food marketing cost index (FMCI) for monitoring and analyzing changes in labor costs and prices of other inputs to food processing and distribution. The FMCI measures price changes for supplies and services used in processing, wholesaling, and food store retailing of domestically produced foods. It does not cover input prices for doing business at eating places, however. The FMCI represents all nonfarm food marketing costs except depreciation of buildings and equipment, long-term interest, and profits.

Prices in the index are weighted by the quantities used in 1972. The purpose is to ensure that price changes of individual input items have the same relative effect on the index proportionate to the use of each input by the food industry. Labor, for instance, is weighted far more heavily than packaging materials because of the food industry's proportionately greater dependence on and costs for labor.

recent years, declining about 3 percent during the 1982-83 recession but rising 12 percent during the 1984 economic recovery. Prices are expected to increase 3 to 4 percent in 1986 because the industry has held off adding production capa-

city and the decline in the value of the dollar may strengthen foreign demand for U.S. paperboard products.

### Transportation Costs Up, Energy Prices Down

Transportation costs represent about 11 percent of marketing costs. In 1985, the railroad freight rate index for food products averaged only 0.8 percent higher than in 1984. Rates are expected to change little this year since demand for and costs of providing rail services are unlikely to increase.

Less than half of all foodstuffs, however, are transported by rail. A larger share, especially fresh fruits and vegetables, are transported by independent truckers. Truck rates are affected by prices of diesel fuel, drivers' wages, and the financing costs and depreciation of trucks. In 1985, it cost independent truckers an average of \$1.16 per mile to operate their vehicles, up less than 1 cent from a year earlier. Costs went up mainly because of much higher insurance costs and a highway fee imposed on vehicles weighing more than 55,000 pounds. Costs are expected to rise little in 1986 because of competition for freight by a growing number of truckers.

Energy represents about 9 percent of the cost of marketing food. The energy costs index, a combined index of fuels and electricity, has been relatively unchanged since 1982. The index averaged 1.8 percent lower last year than in 1984.

Prices of diesel fuel and fuel oil fell about 7 percent, reflecting plentiful stocks and lower world prices for crude oil. Continuing large supplies of oil will weaken the OPEC cartel and exert downward pressure on petroleum product prices in the coming year.

Prices of natural gas and liquid propane gas, the principal energy sources for food processing, were virtually unchanged in 1985. Increases in natural gas prices in 1986 are expected to be below the inflation rate. Moreover, no substantial

expected to follow those of tin cans.

Prices of paperboard products, such as corrugated boxes used to ship most food products, averaged 2.2 percent lower than a year earlier. Price changes for paperboard packaging have been erratic in



changes in natural gas prices are anticipated from the partial deregulation that went into effect in January 1985.

Electricity for operating refrigeration equipment and store lighting account for over two-thirds of food retailing energy costs. Electricity rates were up about 3 percent in 1985 and probably will rise by about the same percentage in 1986. As a result, increases in energy costs are not likely to have a major effect on food prices in 1986.

### Profit Margins Important Part of Food Prices

Although not included in the Food Marketing Cost Index, profits are an important element of food prices. Profit margins of food chains typically average between 1.5 and 2 cents per dollar of sales before taxes, and slightly over 1 cent after taxes. The profit margin of food manufacturers is higher, averaging about 5 cents per sales dollar before taxes and over 3 cents after taxes. The higher margin reflects their large capital investment and slower inventory turnover. Food manufacturers' profit margins were nearly stable throughout 1984 and the first 9 months of 1985. Food manufacturers' profits after taxes averaged 3.2 percent of sales in the first 9 months of 1985, unchanged from a year earlier.

Food chain profits declined, averaging 1.2 percent of after-tax sales, compared with 1.3 percent in 1984 when they were much higher than in other years of the last decade. The higher 1984 profits could be attributed to a slower rise in labor costs, increased sales of nonfood products which have higher markups than foods, and more large stores that were able to spread fixed costs (costs that don't vary with output, such as for the plant or insurance) over a greater sales volume.

Food industry profits this year are likely to be close to last year's since raw



Retail food prices are expected to rise 2% to 4% this year after increasing only 2.3% in 1985.

material and labor costs are not expected to significantly increase, and consumer food spending should continue to rise.

### Outlook for 1986

This year will be a time of adjustment in production and prices for the food industry. Supplies will continue to be ample but more in line with consumer demand.

Food prices are expected to rise 2 to 4 percent above 1985, based on a likely rise of 1 to 3 percent at the grocery store and 3 to 5 percent for meals eaten away from home.

Higher farm prices for meat animals and eggs will raise the farm value of food 1 to 3 percent and will account for about a third of the total increase in food prices. Fewer marketings and higher farm prices for cattle and hogs are expected to raise the farm value of meat about 7 to 9 percent in 1986. The farm value of eggs also is expected to increase, while most other commodities are expected to remain near or slightly below 1985.

The farm-to-retail price spread is expected to increase 2 to 4 percent, accounting for nearly half of the rise in food prices. The higher farm value and increased prices for fish and imported foods will account for the rest.

A look at individual commodities shows that prices of meat are expected to increase from 2 to 4 percent above 1985 because of reduced production and smaller but ample supplies. Beef and pork prices are both forecast to rise within that range. Poultry prices are forecast to remain unchanged or fall slightly as production increases. Strong demand will likely hold prices near 1985 levels as consumers substitute chicken and turkey for the relatively higher priced red meats. Fresh vegetable prices are expected to fall 4 to 6 percent below 1985 because of large supplies, particularly potatoes. Fresh fruit prices will likely rise 5 to 7 percent in 1986, with the largest increases coming in the second and third quarters of the year. Most other food categories are forecast to rise 2 to 4 percent. □



# Projected Growth in American Food Spending

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Today's rapidly changing economic and social environment challenges the producers and marketers of America's agricultural products. Slower population growth, changing age distribution, regional migration, increased longevity, and altered employment patterns are a few significant demographic trends facing the food sector over the next several decades.

A recent ERS report indicates that, despite these changes, the rate of growth in national food expenditures through 1995 may not be much different from the rate for 1965-80. However, two factors—higher incomes and an older population—could mean significant shifts in expenditures among food groups. For example, an aging population alone may mean a 2-percent increase in per capita expenditures for fish by 1995, compared with spending increases of 1.2 percent for beef and 3.1 percent for poultry. The projected 2-percent annual growth in income would boost spending for fish by 12.6 percent versus 7.7 percent for beef and 5.0 percent for pork. Combining population growth with the aging of the population and income growth means expenditures at the national level could increase by almost 31.9 percent for fish, 24.4 percent for beef, and 22.1 percent for poultry between 1980 and 1995.

The ERS study reveals that the effects of changes in income and demographic composition could be almost exactly offset by the slowdown in the population growth rate, leaving total and at-home food spending in 1980-95 growing at the same pace as over the 1965-80 period. During those years, food expenditures rose 29.3 percent, while food-at-home saw a 23.3-percent increase. The ERS projections indicate that, from 1980-95, total food expenditures may rise 29 percent and at-home spending about 24 percent.

## Forces Behind Changing Demand

The ERS study combined an econometric model of consumer food demand with estimates by the Bureau of the Census on population and income growth trends over the next several decades.

The two most significant demographic changes affecting consumer food demand will be the slowing of the overall population growth rate and the subsequent aging of the population. For example, the U.S. population grew from 152.2 million in 1950 to 227.7 million in 1980, a 50-percent increase. However, from 1980 to 2010, the Census Bureau projects that the population may increase by 55.5 million, only 24 percent. (Census projections actually show a range of estimates, but ERS used the midpoint estimate in its study).

Furthermore, from 2010 to 2040, the population may only increase an estimated 9 percent. These figures imply that, from 1980 to 2040, the population will grow more slowly than at any previous time. After 2050, the growth rate is projected to be almost zero (0.01 percent per year). Given the slow growth rates projected, industries that rely on population growth to fuel expansion will need to find alternative markets for their products.

Slower growth will also mean an older population. To illustrate, the median age of the U.S. population in 1983 was at a record-high 30.9 years. (The median age, which means that exactly half the population is older and half younger, is often used as a measure of the age of the population). According to the Census Bureau, the median age will reach 36.3 years at the turn of the century, 40.8 years in 2030, and 42.8 years in 2080.

These increases in the median age of the American population signal important changes in the age distribution. For example, those 65 or older made up 8.5 percent of the population in 1950, 10.5 percent in 1970, and 12.3 percent in 1980. They are projected to account for 14.0 percent of the population in 1990, 16.2 percent in 2010, and 27.3 percent by 2050. The percentage of the population under 35 is projected to decline far into



Older households tend to buy more fresh fruits and vegetables.

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the next century, while the opposite is true for those 35 and over.

### An Older Population Will Change Food Demand

As we age, we tend to change our food buying habits. The Bureau of Labor Statistic's Consumer Expenditure Survey reveals, for example, that older households tend to buy more fresh fruits and vegetables but less food away from home and less alcoholic beverages.

The ERS projections of the impact a changing age distribution will have on future per capita food expenditures assume that all other demographic factors, relative prices, and income remain constant at 1980 levels.

An older population is expected to generate steady increases in all per capita food expenditure groups from 1980 to 2020, except away-from-home eating and alcoholic beverages. Per capita expenditures are projected to decline 3.9 percent for food away from home and 5.8 percent for alcoholic beverages. The declines can be attributed to the projected increase in the percentage of the population over age 64, who spend less on these items than younger groups.

Per capita spending on total food is expected to rise just 2.2 percent, while expenditures on food at home are projected to increase 5.2 percent between 1980 and 2020 (*table 1*). At-home expenditures for meat, poultry, fish, and eggs together may rise 6.4 percent; spending for fruit is projected to increase 7.2 percent; vegetables, 6.7 percent; and fats and oils, 6.2 percent. The groups least affected will be dairy products (up just 2.9 percent) and miscellaneous foods (up 0.7 percent).

Items most affected by the projected changes in the age distribution will be pork, up 8.3 percent from 1980 to 2020; poultry, up 7.6 percent; fresh fruits, up 8.2 percent; fresh vegetables, up 7.8 percent; and margarine, up 10.3 percent. Expenditures for milk and cream will be

**Table 1. How an Aging Population Might Affect Per Capita Food Spending**

	1995	2000	2010	2020
1980 = 100				
<b>Total food</b>	100.9	101.2	102.0	102.2
<b>Food away from home</b>	99.0	98.4	96.9	96.1
<b>Food at home</b>	101.7	102.6	104.5	105.2
Meat, poultry, fish, eggs	102.1	103.2	105.7	106.4
Beef	101.2	102.0	103.9	104.2
Pork	102.8	104.1	107.0	108.3
Other meat	101.7	102.5	104.3	105.1
Poultry	103.1	104.1	106.6	107.6
Fish	102.0	102.9	104.6	105.2
Eggs	102.1	103.1	105.4	106.2
Cereal and bakery products	101.4	102.3	103.7	104.5
Dairy products	101.1	101.6	102.6	102.9
Milk and cream	100.3	100.9	101.9	102.1
Cheese	101.6	101.9	102.6	103.1
Other dairy products	101.5	102.1	102.8	103.6
Fruits	102.1	102.9	105.4	107.2
Fresh	102.3	103.2	106.0	108.2
Processed	101.9	102.5	104.2	105.2
Vegetables	102.4	103.3	105.5	106.7
Fresh	102.8	103.7	106.2	107.8
Processed	101.9	102.7	104.4	105.2
Sugar and sweeteners	101.2	101.7	102.7	104.1
Nonalcoholic beverages	101.7	102.5	103.9	103.9
Fats and oils	102.2	103.1	105.1	106.2
Butter	101.6	101.8	102.3	103.3
Margarine	103.7	105.2	108.2	110.3
Other	101.3	102.2	103.9	104.8
Miscellaneous foods	100.1	100.0	100.4	100.7
Alcoholic beverages	98.3	97.4	96.0	94.2

least affected, rising only 2.1 percent. Cheese will likely increase 3.1 percent; other dairy products, 3.6 percent; and butter, 3.3 percent.

### Rising Incomes Could Boost Food Demand

While an older population would mean changes in demand, income growth will also boost food spending. The ERS economists assumed that real (adjusted for inflation) consumer purchasing power would grow 2 percent annually, a rate on par with the 1960-1980 period.

Projections from 1980 to 2020 show that per capita expenditures could increase for all commodities, except eggs which may decline slightly after 1985. By 2020, total food expenditures per capita are projected to increase 36.9 percent, but away-from-home food expenditures could rise 66.8 percent (*table 2*). At the same time, food-at-home outlays may rise only 18.7 percent.

Commodities projected to be most responsive to income growth between 1980 and 2020 include fish, up 37 per-

## A Cautionary Note on Assumptions

The development of projections is a complex task involving numerous assumptions. Economists Smallwood and Blaylock based their projections on the assumption that changes in income and population would have the same impact in 2020 as they did in 1980. In the income projections, for example, it is assumed that consumers of a given income level will spend an additional dollar of income on the same products between now and 2020 as they spent in 1980.

Furthermore, the authors assumed that price relationships among food products would remain the same. That is, the retail price difference between beef and poultry, for instance, would be comparable in both 1980 and 2020. Alternative opportunities for food choices, as well as tastes and preferences, were also assumed to remain unchanged over the study period.

As the population changes over time, consumers are assumed to acquire the food expenditure patterns of individuals already in those circumstances. For example, a 25-year-old in 2020 has the same food expenditure patterns as a 25-year-old in 1980. Also, the projections represent national averages for food-at-home spending and may not adequately reflect trends in any particular region.

cent; cheese, up 27.6 percent; and alcoholic beverages, up 74.4 percent. Milk and cream and margarine show the smallest expected changes in response to higher incomes.

The projected change in per capita expenditures is not the same for each 10-year interval, even though income growth is assumed to be constant. For example, away-from-home food expenditures per

**Table 2. How Higher Incomes Might Affect Per Capita Food Spending**

	1995	2000	2010	2020
1980=100				
<b>Total food</b>	111.8	116.3	126.2	136.9
<b>Food away from home</b>	119.7	127.7	145.8	166.8
<b>Food at home</b>	106.6	109.0	114.0	118.7
Meat, poultry, fish, eggs	107.1	109.6	114.7	119.2
Beef	107.7	110.5	116.3	121.8
Pork	105.0	106.6	109.5	111.2
Other meat	105.9	107.9	111.5	114.0
Poultry	103.0	103.8	104.7	103.9
Fish	112.6	117.3	127.2	137.0
Eggs	99.8	99.6	99.0	97.6
Cereal and bakery products	105.1	106.8	110.0	112.4
Dairy products	104.5	106.1	109.3	112.3
Milk and cream	100.7	100.9	101.4	101.9
Cheese	110.3	114.0	121.3	127.6
Other dairy products	106.9	109.3	114.4	119.2
Fruits	107.1	110.1	117.3	126.7
Fresh	107.1	110.4	118.6	130.1
Processed	107.3	109.9	115.3	120.4
Vegetables	107.9	110.7	116.2	121.1
Fresh	108.1	111.0	116.9	122.3
Processed	107.1	109.6	114.1	117.3
Sugar and sweeteners	105.1	106.7	109.4	110.7
Nonalcoholic beverages	104.0	105.5	108.3	110.9
Fats and oils	105.8	107.8	111.8	115.0
Butter	111.7	116.1	125.4	134.4
Margarine	102.1	102.6	102.5	100.6
Other	104.6	106.2	109.4	112.0
Miscellaneous foods	108.1	111.0	116.8	122.0
Alcoholic beverages	120.2	128.7	149.0	174.4



capita are projected to increase by 27.7 percent between 1980 and 2000 and 39.1 percent from 2000 to 2020. This is primarily because of the compounding effect of income growth. Higher income will

generate increased per capita expenditures for all but a few commodities, so most of the agricultural sector benefits from higher rates of economic growth.

**Table 3. How Population and Income Combined Might Affect National Food Spending**

	1995	2000	2010	2020
	1980=100			
<b>Total food</b>	129.0	138.9	160.0	181.8
<b>Food away from home</b>	135.9	148.9	177.8	212.2
<b>Food at home</b>	123.9	131.7	147.7	161.7
Meat, poultry, fish, eggs	124.9	133.2	150.2	164.1
Beef	124.4	132.7	149.9	164.9
Pork	123.6	131.2	146.3	157.2
Other meat	121.3	127.9	140.6	150.1
Poultry	122.1	128.4	140.6	148.0
Fish	131.9	143.2	166.9	189.8
Eggs	116.8	121.6	130.5	136.2
Cereal and bakery products	121.2	127.9	140.5	150.7
Dairy products	120.3	126.5	138.6	149.1
Milk and cream	115.0	119.6	127.9	134.3
Cheese	127.0	135.5	152.5	167.7
Other dairy products	124.0	131.8	146.6	161.0
Fruits	125.3	134.0	154.3	176.9
Fresh	125.7	134.9	157.1	183.6
Processed	125.1	133.1	149.8	165.3
Vegetables	126.8	135.4	153.4	169.0
Fresh	127.5	136.4	155.2	172.2
Processed	125.2	133.1	148.9	161.6
Sugar and sweeteners	121.4	127.8	139.4	149.4
Nonalcoholic beverages	113.7	127.3	139.7	149.5
Fats and oils	120.8	130.8	145.6	158.1
Butter	123.5	137.4	156.5	176.3
Margarine	128.3	126.7	137.3	143.4
Other	121.6	128.7	142.3	153.7
Miscellaneous foods	124.0	131.4	146.7	160.9
Alcoholic beverages	134.8	147.7	178.3	215.3

### Putting All the Changes Together

In reality, changes in income growth and the age and size of the population do not occur in isolation. Thus, their effects must be combined to evaluate the total impact on national food demand over the next several decades.

Projections indicate that national food expenditures will increase 81.8 percent between 1980 and 2020 (*table 3*). While away-from-home food expenditures may rise 112.2 percent, at-home food spending could increase 61.7 percent. Major food groups expected to show the largest expenditure increases between 1980 and 2020 are meat, poultry, fish, and eggs, 64.1 percent; fruits, 76.9 percent; and vegetables, 69.0 percent. Population and income changes will have the smallest combined effect on cereal and bakery products, dairy products, sugar and sweeteners, and nonalcoholic beverages.

Commodities rising the most include fish, 89.8 percent; fresh fruits, 83.6 percent; fresh vegetables, 72.2 percent; butter, 76.3 percent; and alcoholic beverages, 115.3 percent. Smaller increases are expected for eggs, up 36.2 percent; milk and cream, 34.3 percent; and margarine, up 43.4 percent. □

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# Building a Foodservice Database

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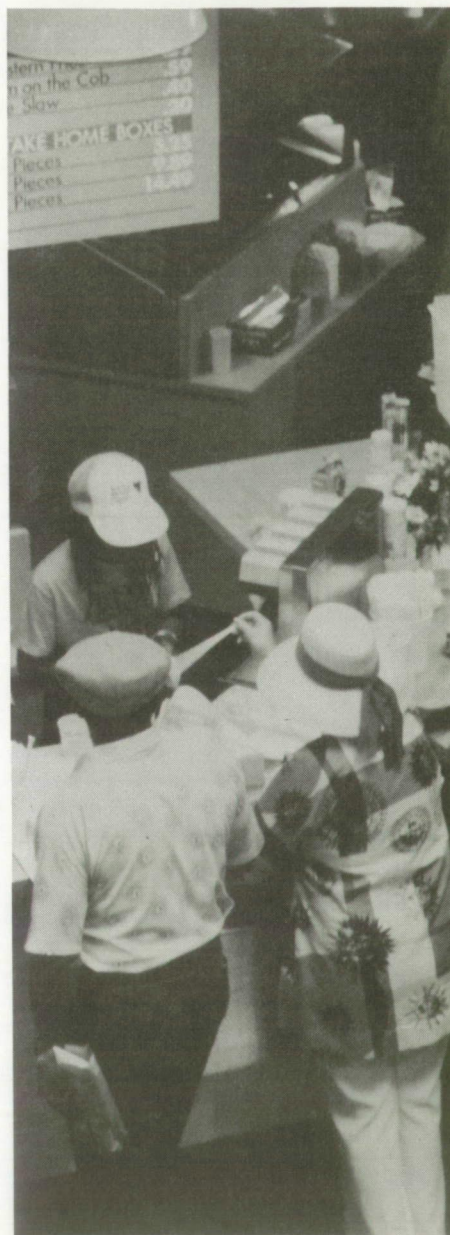
An estimated 42 cents of every food dollar spent in 1984 went to the foodservice industry—those that take care of all our away-from-home eating needs. That's up from 27 cents in 1960. After adjusting for inflation, away-from-home food expenditures increased 2.7 percent annually from 1954 to 1984, compared with increases averaging 1.3 percent a year for food at home. During the same period, per capita disposable personal income gained 2.2 percent annually, contributing to the steady foodservice gains.

Substantial changes in the structure and organization of the foodservice industry have paralleled its rapid growth. Fast food outlets, franchise firms, and large chains have proliferated, while restaurant diners—establishments which usually provide waiter or waitress service at counters and booths—have declined from 23 percent of all eating places 15 years ago to less than 10 percent today. As a result, the nature of the foodservice delivery system and the mix of foods consumed away from home have changed considerably.

As the food-away-from-home industry grew, so did the need for a reliable set of standards for measuring changes and capturing appropriate and useful data. The Economic Research Service, after working with industry representatives for almost two decades, has developed definitions, data sources, methodologies, procedures for collecting information, and techniques for estimating food costs, sales, and outlets.

The result of this cooperative effort is the publication, *Definition of the Foodservice Industry and Methodology for Estimating Selected Statistics*. The report provides industry analysts and researchers with information to identify trends, measure

change, and assess the implications of change in industry structure, away-from-home sales, and food use by producers, manufacturers, and participants in the foodservice delivery system.



As the food-away-from-home industry grew, so did the need for a reliable set of standards for measuring change and capturing useful data.

## Gains and Losses

The foodservice industry consists of individual market segments, each with specialized requirements for food, equipment, and supplies. Each segment uses unique methods of purchasing, storing, preparing, and serving meals and snacks according to the needs of its customers. Thus, expansion or shifts within segments can have implications for the many industries serving the foodservice sector.

To track the changes in particular industry segments, the ERS database provides detailed information on the commercial and noncommercial sectors of the foodservice industry. Commercial foodservice establishments exist primarily for profit and include everything from hotel restaurants and drugstore luncheon counters to separate eating places. Noncommercial foodservice operations, such as nursing homes, child day-care centers, factories, and the military, in contrast, provide a feeding service and are not necessarily profit makers.

The total number of places providing food service increased 13 percent between 1977 and 1984 to 706,098 (table 1). Foodservice sales rose 94 percent between those years to \$158.5 billion. Real sales (adjusted for inflation) were up over 18 percent from 1977 to 1984.

In the commercial foodservice sector, the number of establishments increased only 2 percent between 1977 and 1984, but real sales were up 23 percent. Fast food outlets, by far the fastest growing group in the commercial sector, added 23 percent more units and increased real sales by almost 40 percent in the reporting period. In contrast, the number of cafeterias and the number of separate drinking places each declined by about 19 percent from 1977 to 1984; real sales were unchanged in cafeterias and down 34 percent in separate drinking places.

In the noncommercial foodservice sector, the number of establishments increased 33 percent between 1977 and

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Table 1. Foodservice Outlets and Sales Increased Since 1977

Industry segment	Number of establishments			Sales of meals and snacks (in \$ millions)			Percent change in real sales <sup>1</sup>
	1977	1984	Percent change	1977	1984	Percent change	
<b>Commercial feeding</b>	401,502	409,453	2.0	56,624	116,095	105.0	23.2
Separate eating places	229,892	253,854	10.4	47,426	99,582	110.0	26.1
Restaurants, lunchrooms	118,896	124,433	4.7	24,720	48,419	95.9	17.7
Fast food outlets	100,493	123,769	23.2	20,334	47,319	132.7	39.8
Cafeterias	7,001	5,640	-19.4	1,813	3,022	66.7	0.1
Lodging places	25,931	23,262	-10.3	3,613	7,264	101.1	20.8
Retail hosts <sup>2</sup>	60,652	56,348	-7.1	2,691	4,779	77.6	6.7
Recreation, entertainment <sup>3</sup>	33,619	34,282	2.0	1,915	3,394	77.3	6.5
Separate drinking places <sup>4</sup>	51,408	41,706	-18.9	979	1,076	9.9	-34.0
<b>Noncommercial feeding</b>	223,005	296,645	33.0	25,152	42,390	68.5	8.0
Education	97,325	95,888	-1.5	8,242	12,239	48.5	-1.9
Elementary and secondary	91,300	89,600	-1.9	5,886	7,930	34.7	-6.4
Colleges and universities	3,095	3,288	6.2	2,256	4,092	81.4	9.0
Other	2,930	3,000	2.4	100	217	116.7	30.2
Plants, office buildings	15,187	15,846	4.3	3,576	6,793	89.9	14.1
Hospitals	7,099	6,861	-3.4	3,711	5,817	56.8	-5.8
Care facilities	21,117	28,933	37.0	2,388	5,281	121.2	53.6
Vending machines	3,737	3,556	-4.8	2,508	3,553	41.7	-14.9
Military services	3,971	3,352	-15.6	1,595	2,366	48.3	-0.5
Troop feeding	1,435	1,310	-8.7	1,245	1,765	41.8	-1.5
Clubs and exchanges	2,536	2,042	-19.5	350	601	71.7	3.2
Transportation	799	642	-19.6	1,079	1,922	78.1	7.1
Associations <sup>5</sup>	18,966	19,394	2.3	958	1,562	63.0	-2.1
Correctional facilities	6,907	7,164	3.7	492	1,155	134.8	63.0
Child day care	18,967	84,175	343.8	249	760	205.2	111.8
Elderly feeding programs	11,173	14,035	25.6	202	689	241.1	136.5
Other	17,757	16,799	-5.4	151	252	66.9	0.5
<b>Total</b>	<b>624,507</b>	<b>706,098</b>	<b>13.1</b>	<b>81,776</b>	<b>158,485</b>	<b>93.8</b>	<b>18.4</b>

<sup>1</sup>Consumer Price Index (1967=100). <sup>2</sup>Food services operating within retail establishments such as department stores, variety stores, bakeries, and drugstores. <sup>3</sup>Theaters, amusement parks, stadiums, and racetracks. <sup>4</sup>Data base counts only food and nonalcoholic beverage sales. <sup>5</sup>Membership organizations engaged in civic, social, or fraternal activities (including their lodges or hotels).

1984, but real sales were up only 8 percent. Child day care, elderly feeding programs, and nursing and other care facilities led the noncommercial sector gains. The number of foodservice establishments in correctional facilities was up only 3.7 percent from 1977 to 1984, but real sales climbed 63 percent during the reporting period as the prison population increased by nearly 50 percent. In contrast, food service from vending machines and in schools, hospitals, and the military services declined in both number of establishments and real sales.

### The New Industry Standard

The ERS foodservice data are quickly becoming the standard for the industry. The series will appear in the annual *Statistical Abstract of the United States* published by the Department of Commerce and in *Agricultural Statistics*, issued each year by the Department of Agriculture. The International Foodservice Manufacturers Association has also accepted the ERS methodology and definitions as its industry standard.

ERS will update the data base annually and issue a full report on the industry in

1986. This combination of information will provide those producing and marketing food with important current intelligence to aid in making decisions. □

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# Production and Marketing Changes for Red Meat and Poultry

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We're a nation of meat and poultry eaters, more so than ever...211 pounds for each of us in 1984, up from 164 pounds in 1955. Estimates indicate that per capita meat and poultry consumption was 214 pounds in 1985.

The mix has changed, too. Despite a rise from 71.8 to 80.4 pounds per capita between 1955 and 1984, beef and veal's share of total meat consumption dropped from 44 to 38 percent. Chicken and turkey were the big gainers, jumping from 26.3 pounds in 1955 to 67.1 pounds per capita in 1984. Their share of total meat consumption increased from 16 to 32 percent. Pork consumption at 62 pounds in 1984 was virtually the same as in 1955, although its share declined from 38 to 29 percent.

Underlying much of these changes is an industry that has modernized its production processes, taking advantage of technology to reduce costs and increase production to record levels. But greater efficiencies, modern technologies, and creative management practices have not prevented the meat industry from facing some bad times in the past three decades. This is an industry made up of both large and small producers who have virtually no control over the price of their main input, feed, or their product prices. As a result, reduced corn supplies or overexpansion by producers can mean the difference between profits and losses.

## Production Shifts Among Meats

Before 1953, pork had the largest share of U.S. meat sales. More than 2 million farmers produced hogs in small enterprises, all using similar management practices. Per capita consumption remained relatively stable, with swings largely accounted for by production cycles.

Beef production expanded during the early 1950's and, in 1954, per capita consumption rose above that of pork for the

first time. The hog sector faced several adjustments. Vegetable oils began to give much stiffer competition to the lard market, and the price of lard fell. With lower demand for lard, hog producers became mainly meat producers. Meanwhile, consumer preference for leaner meats further encouraged a shift toward a leaner hog.

Change was also afoot in the poultry industry. Before the early 1950's, broilers were raised in small flocks near cities as a secondary activity to egg production. Advances in feeding and housing methods, breeding and disease control, and management all spurred poultry into the modern age.

## The Early 1970's: A Time for Beef Expansion

Low grain prices, growth in consumer incomes, and low inflation rates in the late 1960's and early 1970's provided the economic incentives to continue expanding beef production. The cattle inventory grew at an unprecedented rate, peaking at 132 million head in 1975 (*figure 1*). In

addition, and perhaps more important, cattle were coming to market heavier as more were marketed from feedlots.

In the 1950's, most cattle were grass-fed, with only a few readied for market on grain in farmer-owned feedlots in the North Central States. By the late 1950's, large commercial feedlots began to appear in the West and Great Plains.

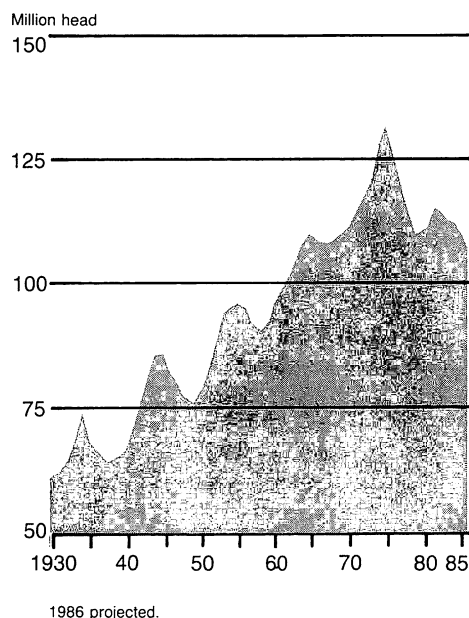
This trend continued into the 1960's. Aided by irrigation, grain sorghum production increased, creating a grain surplus and a new feed base for beef production. Feedlots were organized into large commercial operations able to attract outside capital.

Grain feeding had the added benefit of reducing the time from weaning to slaughter. Until the early 1960's, grass-fed steers were typically slaughtered at 3 to 4 years of age. Grain feeding cut the time to about 18 months for the same average weight. Consumer preferences shifted to the higher quality, grain-fed beef, encouraging greater production.

Cattle feeding also became more efficient because of additives, nutrition research, and genetic improvement in herds. By 1973, the average live weight of cattle slaughtered reached 1,043 pounds, a substantial increase from about 1,000 pounds in 1960. In 1968, when the inventory was about the same as on January 1, 1985, commercial beef production was 20.7 billion pounds, with an average dressed weight of 590 pounds. In 1984, production was 23.4 billion pounds, and the average dressed weight was 623 pounds.

With the incentives and capacity to increase output in the first half of the 1970's, cattle producers overexpanded their herds. In addition, grain prices rose in 1974, and feedlot operators adjusted to higher costs of production by lowering their bids for the cattle they bought to put on feed. Forage supplies also became a problem as land reverted to crop production and carrying capacity on permanent pastures declined because of reduced fertilizer use in the Southeast. Until the mid-1970's, producers in every sector of

**Figure 1. U.S. Cattle and Calf Inventory Peaked in 1975**



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Severe cash flow problems caused by low prices and declining land values have hindered cow-calf producers throughout the 1980's.

the cattle industry had profited from generally expanding beef supplies and consumption.

From 1975 to 1979, the cattle industry went through the sharpest liquidation ever experienced. In 4 years, the inventory fell 22 million head to 110 million. With the sharply reduced inventory and rapidly rising consumer incomes, producers received record-high cattle prices during 1979/80. Net returns (receipts minus cash expenses) substantially improved and remained positive from 1978 to 1980 (figure 2). As a result, herd buildup began again, but this increase halted in 1982. Prices had dropped because of expanding pork and poultry production and

reduced consumer buying power that came with the recession.

Severe cash flow problems caused by low prices and declining land values have hindered cow-calf operators. The current cattle cycle began with an inventory of 110 million head in 1979. It increased to only 115.4 million head in 1982 before being choked by financial problems and drought-reduced forage supplies.

Since 1980, net returns have fallen about \$80 per cow for cow-calf production in the United States. In the Great Plains region net returns fell from an average \$65 per cow in 1980 to \$1 in 1984. As rising fertilizer costs have pushed up forage costs, net returns in the

Southeast have been less than expenses since 1981. The large decrease in net returns from 1980 to 1983 in the Great Plains combined with the drought in 1983 and 1984, reduced the beef cow inventory by 7 percent in 1984.

On January 1, 1986, the inventory was 105.5 million, down 4 percent from a year earlier and the smallest inventory since 1968. Beef cows numbered 33.6 million, down 5 percent from the previous year. In addition, the 1985 calf crop, at 41.0 million head, was the smallest since 1961.

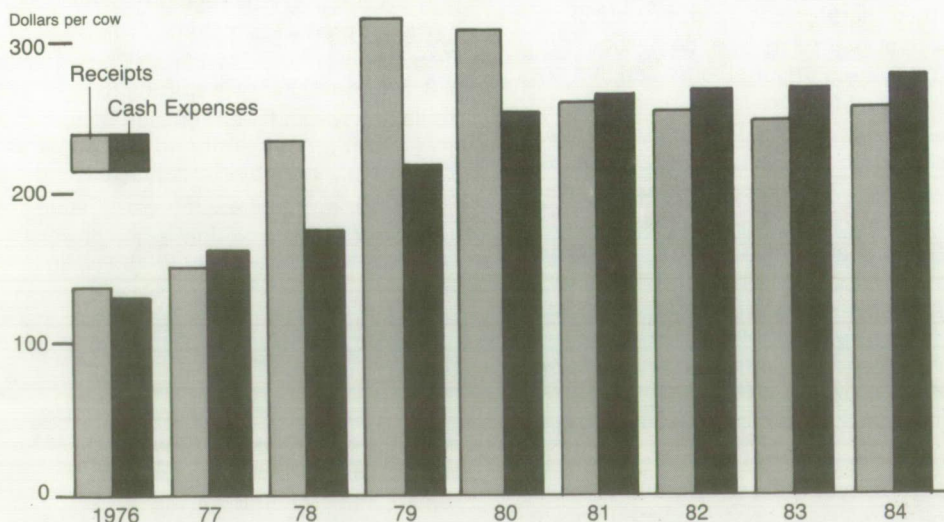
The cattle inventory will probably continue to decline through 1986. Expansion may not resume before 1988 and, then, only at a much slower pace than in previous cycles. Not only has a large portion of the breeding herd gone to market over the past 4 years, but fewer heifers have been retained to replace the cows. Consequently, calf crops have declined each year.

With declining beef supplies and competitive retail prices, cattle prices should strengthen, while low inflation rates will help stabilize production costs. The best inventory level for maintaining a stable cattle industry is difficult to judge, but present forage acreage would probably support 116 to 120 million head.

#### Pork's Market Share Declines

Pork consumption in the United States has been stable for many years, but its market share has declined as total red meat and poultry production has increased. In the 1950's and 1960's, the number of hog producers declined sharply. Farms were combined into larger

Figure 2. Receipts Were Above Expenses in Late 1970's, Below Expenses in 1980's



units or the hog enterprise was dropped. During this time, farmers were able to move in and out of hog production because the investment required was relatively low.

The sharply higher grain prices that pressured the beef and poultry industries in 1974 also reduced returns to hog producers. Low returns led to herd liquidation and sharply reduced pork production in 1975. In the following years, hog prices rose substantially, corn prices dropped, and hog enterprises became profitable once again.

Pork producers began increasing output but, in contrast to past expansions, many built or remodeled facilities to allow them to raise more hogs or become more specialized, so as to take advantage of economies of size and investment tax incentives. More than a third of farrowing facilities available in 1980 were built during 1975-80. Many producers went heavily into debt for this capital investment. In addition, many also bought more land and crop equipment, increasing their debts.

Although returns were relatively good during 1976-78, the expansion in pork output was not as rapid as in previous years because of the lag associated with planning, financing, and building these facilities. In the past, expansion was just a matter of the biological lag.

The expanded production capacity was in place by 1979, but net returns then plunged because of lower hog and higher corn prices. Furthermore, during the late 1970's and early 1980's, interest rates rose sharply. Many producers had outstanding loans with automatic interest rate adjustments. As interest costs climbed, many had to borrow to cover existing loans. So, caught in a financial squeeze, producers began liquidating the large inventory of hogs and set a commercial slaughter record in 1980 of 96.1 million head. As a result, hog prices during the first half of that year dropped below \$30 per cwt from \$37. Also that year, corn prices rose from \$2.36 a bushel in April to \$3.19 in December. With the

liquidation of hogs early in the year and increasing feed costs, prices then jumped to \$48 by October. Despite the recovery in hog prices, net returns to producers fell sharply.

As production sagged in 1981 and 1982, hog prices rose. In the summer of 1982, they averaged \$62 per cwt and, in the fall, a record crop sent corn prices below \$2 a bushel. Hog operations started expanding, and pork production increased in 1983.

In early 1983, the Government instituted the Payment-in-Kind program which drastically reduced the acreage planted that year. The program helped push corn prices to an average of about \$3 a bushel in the second quarter. The expansion that began the year before pushed 1983 hog prices down from \$55 per cwt in the first quarter to \$47 in the spring and summer.

As the drought hit during the summer of 1983, corn prices climbed further, and producers reduced herds. Hog prices dropped to \$42 per cwt in the fall 1983. That year, producers' returns just covered cash costs. In 1984, returns were only a little better because prices averaged slightly higher and corn prices declined with a larger fall harvest.

The current herd reduction is the result of low returns and financial stress in agriculture. Although feed costs have declined sharply since 1983, hog prices have been pressured by large domestic meat supplies and imported pork and live hogs.

Producers are reducing their herds by selling more young female pigs than normal, rather than retaining them for breeding. These marketings raise cash for operating expenses and paying interest on debt. Based on the market hog inventory and farrowing intentions of December 1, 1985, pork output in 1986 will be down about 2 percent.

Hog prices are likely to average in the mid-\$40's for the first quarter of 1986. Some expansion may occur and could continue into 1987 if corn prices remain low. However, the expansionary phase will be modest by historical standards because of the financial problems of many

producers, especially in the Corn Belt where the majority of hogs are raised.

### Broiler Industry Continues To Grow

The shift to a modern, highly coordinated broiler industry began in the 1960's. After very rapid growth in the 1970's, broiler production has expanded less in the 1980's (*figure 3*). The largest annual increase in output during this decade occurred in 1981—a 6-percent expansion.

After losses of 5 cents a pound in 1981, broiler integrators (firms that own the birds and contract with farmers to raise them) cut the rate of expansion. Output of broiler meat increased only 1.5 percent in 1982, but profits still evaded producers. They were in the red by 2 to 3 cents a pound. Producers started expanding operations in the first-half of 1983, but the expansion stopped when sharply higher feed costs wiped out profits. For 1983, output was up 2 percent, and producers were in the hole 1.7 cents for every pound sold.

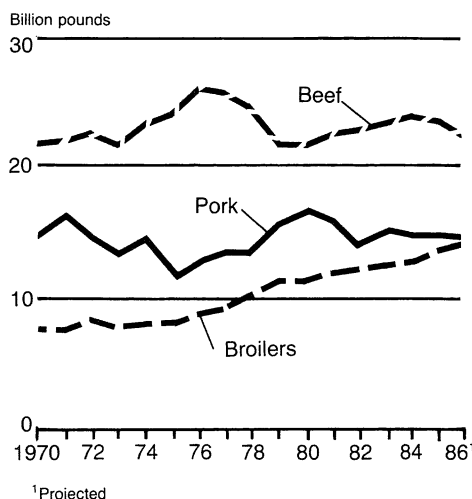
In 1984, for the first time in the 1980's, broiler producers made profits, after having made several cost-saving adjustments. For example, during the 1970's, broiler production could be easily expanded up to 4 percent with extra hatching eggs. Now, hatchery flocks are kept near full capacity with no extra hens, which reduces costs. If extra eggs are needed, however, producers must delay hen slaughter.

Broiler producers are shifting to branded birds and are selling an increasing proportion of their output as cut-up parts. These products usually have higher markups and are more profitable for producers. In addition, some producers have added case-ready products, so retailers can simply take price-marked tray packs of chicken parts out of the shipping box and put them directly in the retail case.

Broiler integrators are also expanding into further processed products. These products are convenient for busy consumers and profitable for the firms. Many of these products are frozen, which



**Figure 3. Increases in Broiler Production in 1980's Slow Slightly from Late 1970's**



helps in scheduling production because sales are made from inventory. Also, nugget-type processed products have been added to most fast food menus and are selling well.

Broiler integrators' attempts at operating fast food and other restaurants, however, have not been as successful. Presently, the most active firm has sold its restaurants, and one other firm has stopped adding them.

The early 1980's did not provide the returns that broiler producers needed to take advantage of the changing technology. While some firms could add new products and processes, other firms needed a period of profits to finance these technological changes.

The integrators, while now in much better shape financially than they were earlier, are not in a position to finance new production houses. In the past, farmers built and financed the broiler houses, then contracted with integrators. These houses have evolved over time into very specialized structures, highly insulated and expensive to construct.

## Adjustment Likely Through End of Decade

Financial stress among livestock producers could persist through the end of the decade, with cash flow shortages for those who are highly leveraged. In addition, meat supplies will likely remain large as poultry and pork producers respond to lower grain prices by expanding output.

Agriculture has become highly capitalized over the last 20 years, and debt financing has become more important. Equipment and machinery investment has become larger, while net returns have declined. The large debt loads carried by many types of farms have reduced producers' alternatives. That is, herd liquidation to raise cash may be the only option for highly leveraged operators. Until the adjustment process is over and costs of production are aligned with prices, livestock cycles will probably be unpredictable.

Prospects are also somewhat clouded by the need for future investment in plants and equipment. By the end of the decade, many facilities will have to be rebuilt. Whether producers will be willing or even able to bear new debt is uncertain. To a large extent, this probably depends on the financial situation of livestock operators (primarily hog and poultry producers) when facilities need to be replaced.

The financial problems that have resulted in adjustments in the cattle and hog sector have not had the

same impact on broiler integrators. The broiler integrators have moved into further processed items, and the expanding economy has strengthened their markets and increased profitability. This could give them an edge in expanding production during the next few years as red meat output declines, partially because of the financial problems facing farmers. If the broiler industry does expand, beef and pork will find stiff competition in their recovery.

Meat supplies are expected to remain near record levels through the end of the decade, and meat prices may rise less than the general rate of inflation. Beef may continue to lose some of its share of the market because of herd reduction, while poultry will gain because of its lower relative price. Pork's market share will fluctuate cyclically, but hog cycles are expected to be less volatile than in the past.

The cattle, hog, and poultry industries are dynamic and constantly adjusting to socio-economic change. However, the 1980's have added a deflationary environment that has resulted in the largest drop in land values since the 1930's. In addition, livestock and grain prices have dropped sharply as supplies have reached record levels. The adjustment process has been, and will likely continue to be, very difficult for many producers.

Currently, farmers that might want to grow broilers would probably have a harder time arranging financing because lenders may be reluctant to add new agricultural loans to their portfolios. Thus, broiler expansion may be limited by a lack of building capital. Some expansion

will be possible by using older houses and cutting the time between batches of broilers. Given the low returns of the early 1980's, broiler integrators will likely continue expanding operations only in line with growth in their food-processing sales. □



# U.S. Consumers Spend World's Smallest Share on Food

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Americans, on average, allocate a smaller share of their total expenditures for food than people in other countries of the world. This reflects both the relatively high incomes and low food prices of the United States. An average of 14 percent of U.S. consumers' total private expenditures (excludes savings and taxes) went for at-home food and beverages in 1982, the latest year for which comparable developed country data are available (*table 1*). The U.S. share for food alone averaged 12 percent.

In contrast, over 18 percent of Canadian consumer expenditures were for food and beverages, with food accounting for almost 15 percent. The shares for British consumers were 17.8 percent for food and beverages and about 15 percent for food. Italy topped the list of seven developed countries, with consumers spending 28.8 percent of total private expenditures for food and beverages and 26.7 percent for food.

The percentage of expenditures for food declined in most developed countries between 1972 and 1982, reflecting abundant supplies and rising incomes.

As expected, the proportion of expenditures devoted to food is much higher in the less developed countries, according to 1980 data (the latest available for worldwide comparisons). In China, consumers allocated an average of 60 percent of their total spending for food, with beverages accounting for another 2 percent (*table 2*). Only consumers in Niger spent a larger share—almost 62 percent—of total expenditures for food and about 2 percent for beverages.

Consumers in the Soviet Union devoted almost 37 percent of total expenditures to food and beverages. Food accounted for about 26 percent and alcoholic beverages nearly 10 percent of total expenditures. □

**Table 1. U.S. Had Smallest Share of Expenditures for Food in 1982**

Country	Total private expenditures	Food expenditures	Food	Food and beverages
	U.S. dollars per person		Percent	
Italy	3,731	996	26.7	28.8
West Germany	6,054	1,401	23.2	NA
France	6,248	1,101	17.6	20.1
Australia	6,573	1,108	16.9	22.3
United Kingdom	4,661	708	15.2	17.8
Canada	6,858	1,010	14.7	18.2
United States	8,644	1,050	12.1	14.4

Source: OECD *National Accounts 1970-82*, Volume II, 1984 edition. Percentages computed by ERS.



In China, an average of 60% of total consumer expenditures went for food.

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**Table 2. Niger and China Rank Highest in Share of 1980 Expenditures for Food**

Country	Food	Nonalcoholic beverages	Alcoholic beverages	Tobacco	Food, beverages, and tobacco
	Percent				
Niger <sup>1</sup>	61.6	0.8	1.0	2.3	65.7
China	60.0	1.0	1.0	2.0	64.0
India	55.6	.9	1.5	2.2	60.2
Sri Lanka	55.4	.3	3.4	5.6	64.7
Philippines	54.9	1.1	3.0	3.0	62.0
Jordan	54.6	1.3	.4	2.3	58.6
Ghana	53.6	.8	3.0	1.2	58.6
South Korea	47.3	.5	2.6	1.6	52.0
Honduras	44.1	[1.2	5.8	2.5] <sup>4</sup>	53.6
Thailand	41.8	2.2	5.0	2.7	51.7
Portugal	38.4	1.5	8.1	2.1	50.1
Panama	38.2	1.2	3.3	1.6	44.3
Greece	38.0	.9	2.3	2.5	43.7
Yugoslavia <sup>2</sup>	37.8	1.8	6.0	2.8	48.4
El Salvador	36.8	1.1	2.6	1.3	41.8
Jamaica	36.6	1.0	4.2	5.4	47.2
Sudan	35.8	.1	.9	1.5	38.3
Zambia	[33.5	.9	3.4	2.6] <sup>4</sup>	40.4
Mexico	[32.2	1.1	2.3	1.7] <sup>4</sup>	37.3
Venezuela	[32.8	.8	4.7	3.2] <sup>4</sup>	41.5
Spain	29.6	.4	1.2	1.0	32.2
Poland <sup>2</sup>	28.3	2.3	12.1	2.6	45.3
Hungary <sup>2</sup>	27.6	1.2	11.6	2.4	42.8
Italy	27.2	.3	2.0	1.9	31.4
Israel	25.6	1.0	.8	1.4	28.8
USSR	25.6	[1.0	10.0	4.0] <sup>4</sup>	40.6
South Africa	25.2	1.3	4.7	2.5	33.7
Zimbabwe <sup>3</sup>	24.6	2.2	[6.2	4.0] <sup>4</sup>	37.0
Puerto Rico	23.5	.7	3.8	1.8	29.8
Singapore	23.4	1.4	2.5	2.6	29.9
Ireland	22.9	1.3	10.3	3.5	38.0
Hong Kong	21.9	1.1	1.6	1.4	26.0
Japan	[21.6	.6	1.4	1.3] <sup>4</sup>	24.9
Finland	21.0	.5	4.0	2.1	27.6
Norway	20.1	1.0	3.5	2.1	26.7
Switzerland	20.1	.8	4.3	2.2	27.4
Austria	19.9	.7	2.5	2.4	25.5
West Germany	[19.5	.8	3.5] <sup>4</sup>	2.0	25.8
Belgium	18.2	1.0	3.3	1.6	24.1
France	18.0	.5	2.1	1.0	21.6
Sweden	17.8	.6	3.9	2.2	24.5
Denmark	17.7	[.8	4.5	2.8] <sup>4</sup>	25.8
Australia	17.3	.3	5.7	2.0	25.3
United Kingdom	16.5	.7	2.0	3.1	22.3
Canada	15.2	.9	2.4	2.1	20.6
Netherlands	14.8	.5	2.0	2.0	19.3
United States	12.7	.8	1.7	1.2	16.4

<sup>1</sup>For 1979. <sup>2</sup>Expenditures for alcoholic beverages were estimated from those reported for all beverages. <sup>3</sup>For 1977.

<sup>4</sup>Distribution within group was estimated.

Source: United Nations *National Account Statistics, 1980*.

## What Percentage Do Americans Spend on Food?

There can be more than one answer. This article, for example, presents a different figure than the following article, "Food Spending and Income," for two reasons. First, this article measures food spending against total personal consumption expenditures, while the following article considers food spending as a percentage of total personal disposable income. Disposable income is a larger figure because expenditures exclude savings. ERS does not currently have data to estimate the share of personal disposable income spent for food for many countries.

In addition, the data in this article are only for at-home food and beverages, whereas the following article reports at-home, away-from-home, and total food expenditures as a percentage of income.



# Food Spending and Income

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Personal consumption expenditures were about \$2.6 trillion in 1985, an increase of 6.6 percent from a year earlier. Of this total, \$420 billion was for food, up 5.5 percent from 1984 and 13.7 percent above food expenditures in 1983 (table 1).

Food-at-home expenditures reached \$291 billion, up 4.9 percent from a year earlier, while away-from-home food spending was up 6.7 percent to \$130 billion. After adjusting for food price inflation, which has been low in the food-at-home market, expenditures on food at home were up 3.7 percent from last year. In the away-from-home food market, expenditures rose only 2.6 percent after adjusting for inflation. Prices in the restaurant industry have risen at a higher rate than the food-at-home market because restaurant meal prices are much more heavily weighted by food service costs than raw product costs. Thus, food-away-from-home costs are highly affected by inflation in the general economy.

Food expenditures increased from 14.9 percent of personal disposable income in 1984 to 15.0 percent in 1985. The proportion of income spent on food varies widely among different income groups and generally declines as income rises. Data from the Bureau of Labor Statistics's 1982/83 Consumer Expenditure Interview Survey (the latest data available) reveal that households earning less than \$10,000 spent an average of 36.5 percent of their pre-tax income on food. The percentages for other income groups were: \$10,000-\$14,999, 19.9 percent of income;

\$15,000-\$19,999, 16.1 percent; \$20,000-\$29,999, 13.8 percent; \$30,000-\$39,999, 11.5 percent; and \$40,000 and up, only 8.8 percent. The average for all households surveyed was 13.6 percent of pre-

tax income. These figures include only households designated as having complete income reporting, but do not account for possible under-reporting of income. □

**Table 1. How Disposable Personal Income Is Spent<sup>1</sup>**

	1983	1984	1985
Billion dollars			
<b>Disposable personal income</b>	2,425.4	2,670.2	2,801.1
<b>Total personal consumption expenditures</b>	2,229.3	2,423.0	2,581.9
Nondurables	817.0	872.4	912.5
Food, excl. alcoholic beverages	369.8	398.6	420.3
At home	258.0	277.0	290.6
Away from home	111.7	121.6	129.7
Alcoholic beverages	52.3	53.1	53.9
At home	33.4	33.1	33.2
Away from home	18.9	20.0	20.7
Cleaning and household supplies	23.6	25.1	26.5
Toiletries	20.4	22.0	23.3
Tobacco	28.0	30.3	32.1
Drugs	24.4	26.4	28.3
Clothing and shoes	135.2	147.4	156.1
Gas and oil	90.1	90.7	92.0
Fuel oil and coal	17.5	17.9	15.8
Other	55.6	60.9	64.1
Durables	289.6	331.1	360.8
Motor vehicles and parts	130.6	153.8	167.7
Furniture and household equipment	107.4	119.4	128.9
Other	51.7	57.9	64.1
Services	1,122.7	1,219.6	1,308.7
Housing	344.0	371.3	403.3
Household operation	155.9	166.0	173.2
Transportation	74.7	82.1	86.8
Personal care	28.1	29.5	31.0
Medical care	237.4	259.5	280.3
Personal bus. service	132.6	147.4	160.3
Recreational services	61.0	65.4	69.0
Other	89.0	98.5	104.8
<b>Savings</b>	133.2	172.5	129.7
<b>Other<sup>2</sup></b>	62.9	74.7	89.5

<sup>1</sup>Reflects data as of January 22, 1986. <sup>2</sup>Includes interest paid by consumers to businesses and personal transfer payments to foreigners.

Source: U.S. Department of Commerce, Bureau of Economic Analysis.

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# Recent Trends in Domestic Food Programs

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*This article compares food program participation and costs for the July-September quarter of 1985 with the same 3 months of 1984. Preliminary data are reported as of November 1985 and are subject to revision. Entitlement and bonus commodities are included where applicable. Administrative costs are excluded unless noted.*

An average of 7.2 million households participated in the Food Stamp Program (FSP) during the third quarter of 1985, a decline of 1.7 percent from 1984. The average number of people participating in the program fell by 2.4 percent, from 20.0 million to 19.5 million, largely reflecting the improvement in the national economy (table 1). Average monthly benefits rose 4.4 percent to \$44.21 per person. Federal expenditures (including administrative costs) totaled \$2.83 billion during July-September 1985, up from \$2.76 billion. Food stamp benefits represented 91.4 percent of total program expenditures, compared with 91.8 percent in the third quarter of 1984.

Average participation in the Nutrition Assistance Program (NAP) in Puerto Rico totaled 1.5 million persons in 1985, the same as a year earlier. The program is operated and funded separately from the FSP and has been funded at a constant level of \$825 million since its inception in July 1982. The NAP provides cash benefits to aid participants in purchasing a nutritionally adequate diet. Average monthly benefits per person rose 6.3 percent to \$47.11 during the third quarter of 1985. The total value of benefits distributed to participants reached \$208.4 million, a 4.5-percent increase.

## Child Nutrition Programs

An average of 23.2 million children participated each day in the National

School Lunch Program (NSLP) during September 1985, compared with 23.4 million a year earlier. Data for July and August are excluded because most schools are not in session during the summer months. During the school year, the program is available to about 90 percent of the children enrolled in public and private elementary and secondary schools. Private schools may offer the program if their annual tuition is less than \$1,500 per child.

Federal expenditures for the NSLP rose 4.0 percent to \$482.8 million, including commodities and cash-in-lieu of commodities.

Cash expenditures for the School Breakfast Program declined 0.2 percent from \$50.09 million to \$49.98 million

**Table 1. Average Participation in USDA Food Programs**

Program	July-Sept. 1984	July-Sept. 1985
	Millions	
Food Stamp Program	20.0	19.5
National School Lunch Program <sup>1</sup>	23.4	23.2
School Breakfast Program <sup>1</sup>	3.2	3.2
Special Supplemental Food Program for Women, Infants, and Children (WIC)	3.1	3.2
Nutrition Assistance Program in Puerto Rico	1.5	1.5
Child Care Food Program <sup>2</sup>	1.0	1.0
Summer Food Service Program <sup>3</sup>	1.4	1.5
	Thousands	
Commodity Supplemental Food Program	140.5	140.7
Elderly Feeding Pilot Project	17.7	19.3
Food Distribution Program Indian Reservations Trust Territories	126.4	139.2
	2.4	4.8

<sup>1</sup> September only. <sup>2</sup> Average daily attendance in September. <sup>3</sup> Average daily attendance in July.

Source: Monthly data from the Food and Nutrition Service.

(table 2), while average daily participation remained at 3.2 million children. Of the 74.4 million breakfasts served in the third quarter of 1985, 84.8 percent were free, 4.0 percent were purchased at a reduced price, and 11.2 percent were purchased at the full price.

A total of 145.4 million meals were served under the Child Care Food Program, an 8.2-percent increase over the previous year. Food costs for the Child Care Food Program totaled \$97.6 million, an 11.8-percent increase from the third quarter of 1984.

The Summer Food Service Program funds snacks as well as meals for children in needy neighborhoods when school is not in session. In July 1985, daily attendance at facilities offering the program was 1.5 million. A total of 62.9 million meals were served during the third quarter of 1985, compared with 58.7 million meals a year earlier. Meal costs and the value of commodities distributed to participants rose from \$75.3 million to \$83.1 million, a 10.4-percent increase.

Preliminary data show that the Special Milk Program served 39.0 million half pints of milk in the third quarters of both 1984 and 1985. Federal expenditures for this program amounted to \$3.75 million, up slightly from \$3.66 million a year earlier.

## Supplemental Food Programs

The Special Supplemental Food Program for Women, Infants, and Children (WIC) served an average of 3.2 million participants per month, compared with 3.1 million a year earlier. In the third quarter of 1985, children accounted for 1.6 million participants; infants, 891,000; and women, 687,000. Food costs totaled \$309.1 million, up from \$281.2 million in the previous year.

The Commodity Supplemental Food Program (CSFP), which is similar to the WIC program, currently operates in 12 States and the District of Columbia. Average participation was 140,700 per

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month in July-September 1985, compared with 140,500 a year earlier. Food costs for the program were down about \$850,000 to \$8.9 million.

The Elderly Feeding Pilot Project served about 19,300 persons during the third quarter of 1985, a 9-percent increase from a year earlier. Total costs, however, declined approximately \$60,000 to \$587,000 during the same period due

to lower food costs and administrative expenses. Food costs declined by 5.6 percent from \$537,000 to \$507,000, while administrative expenses fell by 27.5 percent from \$110,000 to \$80,000.

#### Food Distribution Programs

The Food Distribution Program helps needy families living on Indian reservations and in the Trust Territories of the

Pacific Islands by providing food packages containing USDA-donated foods. The Food Distribution Program had three more projects participating in September 1985, for a total of 104. Food costs amounted to \$12.2 million, a 5.8-percent increase over the third quarter of 1984.

The Nutrition Program for the Elderly served an average of 907,000 meals daily at approximately 14,000 sites. In com-

**Table 2. Federal Cost of USDA Food Programs<sup>1</sup>**

Program	1983	1984	1984 (quarters) <sup>2</sup>				1985 <sup>2</sup>		
			I	II	III	IV	I	II	III
Million dollars									
Family Food									
Food Stamps	11,119	10,675	2,769	2,668	2,534	2,703	2,771	2,694	2,582
Nutr. Asst. Prog. in Puerto Rico <sup>3</sup>	825	825	206	206	206	206	206	206	206
Food Distribution									
Food Distribution on Indian Reservations	36	43	10	10	12	12	12	12	12
Schools <sup>4</sup>	819	828	270	161	148	246	273	150	157
Other <sup>5</sup>	229	225	66	61	44	54	47	59	52
Temporary Emergency Assistance <sup>6</sup>	1,130	1,059	269	269	249	272	256	241	189
Cash in lieu of Commodities <sup>7</sup>	126	133	36	30	36	31	36	35	34
Child Nutrition <sup>8</sup>									
School Lunch	2,443	2,550	827	606	318	800	807	643	328
School Breakfast	357	378	119	91	50	119	117	99	50
Child Care Food and Summer Food Serv. Prog.	401	454	93	108	155	98	101	119	173
Special Milk	17	16	5	4	4	4	4	4	4
WIC <sup>9</sup>	1,194	1,417	349	351	354	363	368	375	385
Total <sup>10</sup>	18,696	18,603	5,023	4,612	4,063	4,908	4,998	4,637	4,172

<sup>1</sup>Calendar years. Administrative costs are excluded unless noted. <sup>2</sup>Preliminary. Quarterly data may not add to annual total due to rounding. <sup>3</sup>Puerto Rico transferred from the Food Stamp Program to a substitute nutrition assistance program on July 1, 1982. Includes special projects expenditures. <sup>4</sup>National School Lunch, Child Care Food, Summer Food Service programs, and commodity schools. <sup>5</sup>Commodity Supplemental Food Program, Elderly Feeding Pilot Project, Nutrition Program for the Elderly, and donations to charitable institutions. <sup>6</sup>Initiated December 1981. <sup>7</sup>Child nutrition programs and the Nutrition Program for the Elderly. <sup>8</sup>Cash expenditures. <sup>9</sup>Special Supplemental Food Program for Women, Infants, and Children. Includes administrative costs. <sup>10</sup>Program data may not add to total because of rounding.

Source: Monthly data from the Food and Nutrition Service.



parison, the program served an average of 865,000 meals at about 13,000 sites in the third quarter of 1984. Meal costs fell about \$2.2 million to \$31.8 million, with cash-in-lieu of commodities accounting for \$28.3 million of the total.

The Temporary Emergency Food Assistance Program distributed \$189.5 million in commodities, a 23.8-percent decrease from \$248.8 million in the third quarter of 1984. The program distributes surplus commodities to low-income U.S. households. It has the dual goals of reducing Federal surplus inventories and storage costs and providing nutritional assistance to needy persons. A major source of the decline was a reduction in the level of butter distributed—from 12 to 6 million pounds per month. This was largely in response to the provisions of the authorizing law which require a reduction in donations if a substantial amount of margarine sales are displaced by the donations. □

## Food Stamp Benefits Rise

Maximum food stamps benefits rose 1.3 to 1.7 percent in October 1985 to reflect the cost of the Thrifty Food Plan (TFP) in June 1985. In the 48 coterminous States and the District of Columbia, maximum benefits for a family of four increased from \$264 per month to \$268. Benefits for other household sizes are shown on the accompanying table. Benefits are higher in Alaska, Hawaii, Guam, and the Virgin Islands to account for significantly higher food prices.

Food stamp benefits are based on the cost of the TFP and net household income. The TFP is the least costly of four food plans developed by USDA. It specifies the amounts of foods from 31 different food groups that households might use to provide nutritious diets for household members. Each month USDA estimates the cost of the TFP and the other food plans. The cost of the TFP in June of each year for a specifically defined family of four represents the maximum allotment for a four-person household. This allotment is adjusted to reflect larger or smaller household sizes.

Eligible households with no net monthly income receive the maximum food stamp allotment. For households with net monthly income, the maximum allotment (for the household size) is reduced by 30 percent of the household's net monthly income. Non-elderly households are allowed the following deductions from gross income to determine net income: an 18-percent deduction from earned in-

## Maximum Food Stamp Benefits<sup>1</sup>

Household Size	Nov. 1984 to Sept. 1985	Oct. 1985 to Sept. 1986
Dollars		
1	79	80
2	145	147
3	208	211
4	264	268
5	313	318
6	376	382
7	416	422
8	475	483
Each additional member	+59	+60

<sup>1</sup>Benefits schedule for the 48 coterminous States and the District of Columbia. Separate schedules exist for urban and rural Alaska, Hawaii, Guam, and the Virgin Islands.

Sources: U.S. Dept. of Agriculture, Food and Nutrition Service. Food Stamp Program, March 1985, p. 6; and Federal Register, Vol. 50, No. 174, September 9, 1985, p. 36642.

come, a \$98 standard deduction, and a deduction up to \$139 for shelter/dependent care costs.

Households with a disabled or elderly member are exempted from this limit. They are entitled to subtract the full value of all shelter costs greater than 50 percent of their adjusted income. Further, any monthly medical expenses for the elderly or disabled member over \$35 can be deducted from the total gross income for the household.

Changes legislated in the Food Security Act of 1985 (popularly known as the 1985 Farm Bill) will alter various elements of the Food Stamp Program, including some of the above. These changes will be detailed in an upcoming *National Food Review* article.

## Food and Nutrition Legislation

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*Numerous food and nutrition bills have been introduced in Congress. Some of the recent proposals are briefly described below.*

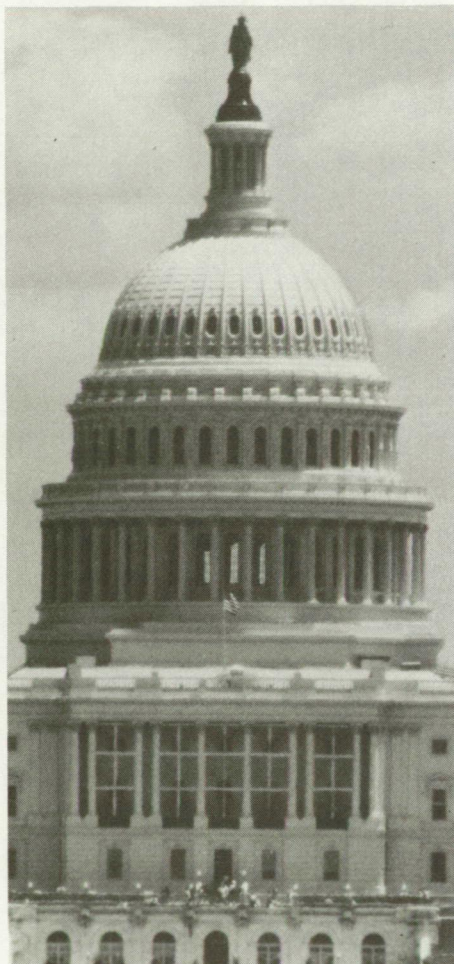
### Food Safety and Quality

H.R. 3488 - Rep. John Seiberling (OH)

This bill would amend the Agricultural Marketing Act of 1946 to make nutritional content a factor in classifying agricultural products. Under the provisions of the 1946 Act, USDA has developed a grading and classification system for many types of agricultural products—for example, fruits, vegetables, grains, livestock, and poultry—based on class, quality, quantity, and condition. This bill would require that USDA add nutritional content to the other criteria used to determine quality.

H.R. 3637 - Rep. Vic Fazio (CA)

This bill would provide for payment of losses incurred by domestic manufacturers, packers, canners, and distributors as a result of the ban on cyclamates announced on October 18, 1969, by then-Secretary of the Department of Health, Education, and Welfare, Robert Finch. Many companies were left with substantial inventories of prepared and packaged foods containing cyclamates. This bill would stipulate that the Government did not follow correct procedures in implementing the ban and would allow any entity with a case to go directly to court to



establish damages. The United States Claims Court would have jurisdiction to hear and render judgement on the amount of any claims. Suits would have to be filed within 1 year after enactment of this bill.

H.R. 3751 - Rep. Charles Rangel (NY)  
S. 1699 - Sen. Howard Metzenbaum (OH)

These identical bills, called the Nutritional Information Labeling Act of 1985, would amend the Federal Food, Drug, and Cosmetic Act to require that food labels contain information on fats, cholesterol, sodium, and potassium. The label would have to state the common name of all fats and oils in the food, plus the number of grams and calories for each. Fats would be further categorized as saturated, polyunsaturated, and monounsaturated—listing the grams and calories of each group. The number of grams of cholesterol in the food would also appear on the label. In addition, the bills would require the label to list the number of milligrams of sodium and potassium in the food (manufacturers with sales of less than \$500,000 would be exempt from this provision). The Department of Health and Human Services would have 8 months after enactment to draft appropriate regulations to take effect 10 months later.

### Other Legislation

S. 1553 - Mark Hatfield (OR)

This bill, entitled the Beverage Container Reuse and Recycling Act, would require a deposit on beverage containers to promote a national system for reusing or recycling these empty containers. The refund value of the container could not be less than 5 cents. In the bill, beverage is defined as beer or other malt beverages, mineral water, soda water, or carbonated soft drinks. These deposit provisions would take effect 2 years after passage of the bill. Presently nine States have similar laws. □

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## USDA Actions

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*USDA regularly implements operational and regulatory changes that affect the status of food and nutrition in the United States. Here are some recent actions.*

**Medfly Restrictions:** All Federal restrictions relating to the Mediterranean fruit fly quarantine in Dade County, Florida, have been lifted. Fresh fruits, vegetables, and plants can again move interstate. USDA officials imposed emergency regulations May 8, 1985, on 90 square miles after Medflies, a destructive pest of fruits and vegetables were found in the area.

**Unshu Oranges:** All Unshu oranges imported into Alaska from Japan must now meet stringent requirements to guard against the possibility of introducing citrus canker into the United States. Formerly, these safeguards concerning growing, packing, inspecting, treating, labeling, and certifying Unshu oranges were not required for those brought into Alaska for consumption there, but were required for those brought into Hawaii, Oregon, Washington, Idaho, and Montana. Unshu oranges are not permitted elsewhere in the United States. Inspections by USDA's Animal and Plant Health Inspection Service have shown that some Unshu oranges imported for Alaskan consumption have been taken to other places in the continental United States. Therefore, the import requirements on these oranges were tightened to protect U.S. citrus-growing areas from citrus canker.

**Greenhouse Cucumbers:** USDA has updated its 51-year-old grade standards for greenhouse cucumbers to match 1980's technology. The new voluntary standards delete age/maturity requirements from all grades; establish a definition for "injury" by specific defects for U.S. Fancy grade; establish minimum standards for cleanli-



ness, defined as "practically free from dirt or other foreign material"; require that U.S. Fancy grade cucumbers be free from cuts, and the U.S. No. 1 and No. 2 grades be free from unhealed cuts; establish a minimum length that, unless otherwise specified, will not be less than 11 inches; redefine the "standard pack" provision to reflect current packing practices; set forth definitions for "permanent defects" and "condition defects"; and update the format for the standards.

**National Dairy Promotion Order:** Dairy farmers across the United States have voted overwhelmingly in favor of continuing the Dairy Promotion and Research Order. The continuation was approved by 107,926 dairy producers, or

89.7 percent of those voting. The Dairy and Tobacco Adjustment Act of 1983 required that a nationwide referendum be held to determine whether the order should be continued after September 30, 1985. Only those farmers who were engaged in dairy production during April 1985 were eligible to vote. The order was established to implement a national program for the promotion of dairy products and nutritional education. The program is financed by a 15-cent-per-hundred-weight assessment on all milk produced in the 48 contiguous States and marketed commercially by dairy farmers. It is administered by the Dairy Promotion and Research Board, comprised of 36 dairy producers appointed by the Secretary of

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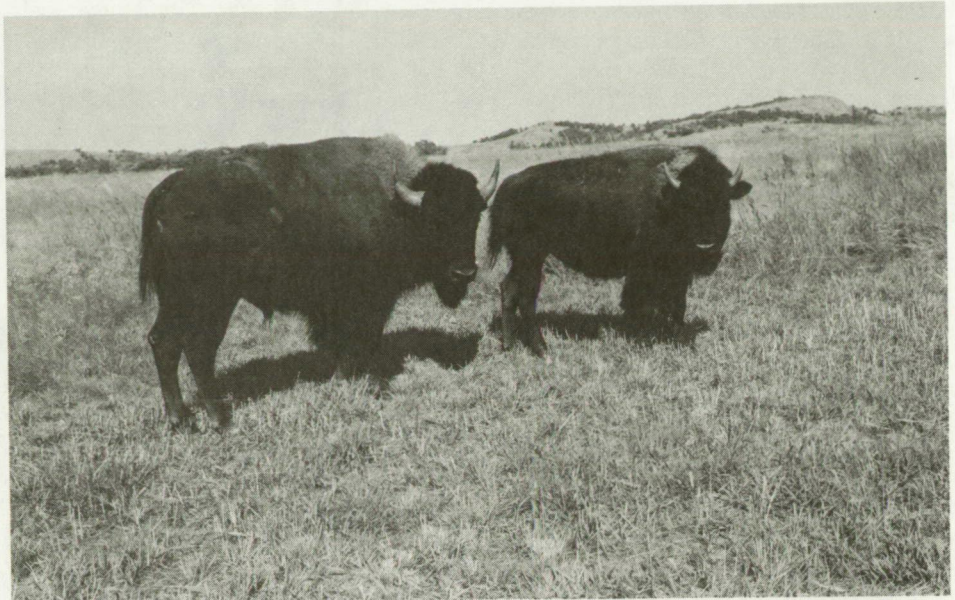


Agriculture to represent the dairy industry.

**Turkey Inspection:** USDA has adopted an alternate slaughter inspection system for turkeys that is more efficient than traditional inspection and just as effective, according to Donald L. Houston, administrator of USDA's Food Safety and Inspection Service. The new system will allow plant employees to independently trim bruises and other defects after the turkey has passed USDA inspection. Under the traditional method, inspectors identified defects, directed plant employees to trim them, and then verified that the trimming was done properly. The change will allow one inspector to inspect up to 25 light birds per minute (those weighing less than 16 pounds), up from the 20 possible under the traditional method. USDA inspectors will continue to check the outside, inside, and internal organs of all turkeys for signs of disease to determine which birds should be condemned. Plants wishing to be considered for the new system must use a USDA-approved quality control program on their processing line.

**Sugar Import Quota:** The base import quota for sugar during the 10 months beginning December 1, 1985, will be 1.72 million short tons, raw value. Minimum boatload shipments plus "specialty" sugar imports of 2,000 short tons may bring total quota imports to about 1.85 million short tons, raw value.

**Farm Marketing Grants:** USDA has awarded grants to the Massachusetts Department of Food and Agriculture and the Iowa Department of Agriculture to help those States develop direct wholesale and retail markets for their farm products. The \$50,000 Massachusetts grant will be used to establish a wholesale-retail market outlet in the Worcester area.



USDA has adopted more flexible rules for the Federal inspection of buffalo before slaughter.

The \$73,468 Iowa grant will be used to fund surveys of Iowa fruit and vegetable producers to determine their interest in developing centralized post-harvest handling and marketing facilities. The grants were awarded under the USDA's Federal-State Marketing Improvement Program, which provides Federal matching funds to qualifying States for research and experiments in marketing, transportation, and distribution of agricultural products.

**Buffalo Inspection:** USDA has adopted more flexible rules for the Federal inspection of buffalo before slaughter. Under the new rules, inspection of live buffalo will no longer be required to take place only on plant premises. Instead, USDA inspectors can check live buffalo at three alternative locations: on the producer's premises, outside the transport vehicle at the slaughtering plant, or in a pen at the plant. Also, Federal and cooperating State plants are allowed to use a new triangular brand to indicate inspected and passed buffalo meat and meat products. The triangular brand is to be used instead

of the Federal mark traditionally used on inspected and passed red meat animals. USDA provides voluntary inspection services for game animals such as buffalo for a fee. The buffalo industry uses the voluntary program to ensure that buffalo meat and meat products are safe, wholesome, and accurately labeled.

**Oriental Fruit Fly:** On October 22, 1985, USDA imposed a quarantine in parts of California's Los Angeles and Orange Counties to help prevent the spread of the oriental fruit fly, one of the world's most destructive fruit and vegetable pests. Male and female adult flies and larvae were found in the two mainly residential areas. The quarantine regulations restrict the movement of oriental fruit fly hosts—approximately 100 kinds of fruits, nuts, vegetables, and berries—as well as soil and some other items out of the infested areas. Before any of the regulated items can be moved interstate, a permit must be obtained from USDA.

□



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**Food Spending in American Households, 1980-81** by David M. Smallwood and James R. Blaylock; 144 pp.; July 1985; \$5.00; order Stock Number: 001-019-00410-0.

A data source on weekly food expenditures per person, based on the 1980-81 Continuing Consumer Expenditures Survey prepared by the Bureau of Labor Statistics.

**Food Cost Review, 1984**; 56 pp.; July 1985; \$2.00; order Stock Number: 001-019-00411-8.

A wrapup of price changes at the supermarket in 1984. Retail prices of most foods averaged higher in 1984. Farm value of USDA's "market basket" of foods rose 5.3 percent, the first time since 1978 that the farm value increase exceeded the retail food price rise.

**Increased Foreign Investment in U.S. Food Industries** by James M. MacDonald and Scott A. Weimer; 24 pp.; September 1985; \$1.00; order Stock Number: 001-019-00407-0.

Describes recent trends in direct foreign investment in U.S. food industries, emphasizing developments in manufacturing, with secondary attention to other sectors. This report also details the expansion of foreign investment during 1976-82, showing principal industrial

directions of foreign investment. Home countries for foreign parent firms are identified.

**Food Consumption, Prices, and Expenditures, 1964-84**; 125 pp.; December 1985; \$4.25; order Stock Number: 001-019-00423-1.

Over 100 tables present the latest annual estimates of per capita food consumption by product, food supplies and utilization, nutrient availability, and retail and producer price indices.

**1985 Agricultural Chartbook**; 96 pp.; December 1985; \$3.50; order Stock Number: 001-019-00428-2.

A valuable research tool, popular teaching device, and convenient format for presenting a complete overview of the agricultural sector. Its 278 charts illustrate data and trends for agricultural subjects ranging from farm income to consumer costs, and from commodities to agricultural trade. Charts showing food programs, cost of production figures, farmland numbers, and population trends round out the picture. Note: An enlargements version of the chartbook, with



each of the 278 charts in reproducible black and white on a page of its own, is also available from GPO for \$10.00 per copy. For this version, ask for *Enlargements: 1985 Agriculture Chartbook*, Stock Number: 001-019-00429-1.

**Agriculture's Links with U.S. and World Economies** by Alden C. Manchester; 60 pp.; September 1985; \$1.50; order Stock Number: 001-019-00409-6.

Describes the linkages between farming, the input supplying industries, and the industries manufacturing and distributing farm products. Within the last 30 years, the food and fiber system has found itself increasingly reliant on non-farm industries and increasingly affected by general economic developments here and abroad.

**U.S. Agriculture's Potential to Supply World Food Markets** by Clark Edwards; 56 pp.; August 1985; \$2.00; order Stock Number: 001-019-00403-7.

Assesses U.S. agriculture's capacity to meet domestic and export demands, and the likely consequences of doing so, under different economic assumptions about the future. By shifting production among regions, adopting new technology, and keeping up the quality of its resources, U.S. agriculture could double its exports within the next 30 years.

**Developmental Consequences of Unrestricted Trade** by Thomas Vollrath;

20 pp.; May 1985; \$1.00; order Stock Number: 001-019-00391-0.

An analysis of the economic forces that determine how trade affects development and growth. International trade, unencumbered by protectionism, stimulates economic growth in both developed and developing countries. Undistorted trade is a catalyst to economic growth because it unleashes market forces that promote development.

**World Indices of Agricultural and Food Production, 1975-84**; 180 pp.; June 1985; \$6.50; order Stock Number: 001-019-00408-8.

Presents indices of total and per capita agricultural and food production for 1955-84 and production data for 1975-84 for 11 countries, 12 regions, and the world. World agricultural production grew at a compound annual rate of 2.4 percent since 1955, while the rate on a per capita basis was only 0.5 percent.

**Dynamics of Comparative Advantage and the Resistance to Free Trade** by Thomas Vollrath; 28 pp.; August 1985; \$1.00; order Stock Number: 001-019-00396-1.

Presents possible trade strategies for both developing and developed countries and discusses their implications for U.S. agriculture. The income gap between developed and developing countries could narrow if the economies of developing countries become more responsive to market forces. Primary manufacturing has become the fastest growing com-

ponent of many developing countries export growth. This report cites 26 developing countries which have built industries to produce and export basic manufactured products.

**Major Uses of Land in the United States: 1982** by H. Thomas Frey and Roger W. Hexem; 36 pp.; June 1985; \$1.25; order Stock Number: 001-019-00398-7.

Discusses the major uses of the Nation's 2.3 billion acres of land in 1982: cropland, 469 million acres; grassland pasture and range, 597 million acres; forest land (exclusive of areas in special-purpose uses), 655 million acres; special uses, 270 million acres; and miscellaneous other land, 274 million acres. Changes in cropland and pasture acreages were barely perceptible during 1978-82. Forest land (except special use areas) and miscellaneous other land decreased sharply as large acreages in these categories were reclassified as parks, wilderness areas, and related uses.

**Rural Development Perspectives**; 3 issues per year; averages 44 pages per issue. Annual subscription: \$10.00 domestic, \$12.50 foreign.

Shows the practical application of research in rural banking, aging, and housing, the nonmetro labor force and poverty, and farm policy impacts on rural areas. This periodical conveys in a crisp, nontechnical manner the chief results of current research on rural areas. □



# In the News...

*The aim of agricultural research is an abundant supply of high quality food and fiber. There are always new challenges. Following are selected food research projects being conducted by USDA's Agricultural Research Service.*

## National Consumers Week

"Consumers Rate Quality" is the slogan for the April 20-26, 1986, observance of National Consumers Week. This is a declaration that consumers deserve quality products and services, as well as set quality standards with their marketplace dollars—a theme familiar to savvy businesses and consumers.

National Consumers Week is the time officially designated each year to recognize and promote the role of consumers in our competitive free enterprise system. The week provides an opportunity for schools, consumer and community groups, businesses, and government to highlight existing consumer offices, programs, and services, raise awareness of consumer education and information materials, and launch new activities. The goal of National Consumers Week is to generate or enhance working relationships that improve the standing or functioning of consumers year round.

A free publication, *How to Run a Consumer Week*, is available by calling toll-free 1-800-325-7272.

## Vitamin C May Help Postpone Cataracts

Postponing cataracts through diet may be possible, according to recent USDA research. Sunlight and oxygen damage the unique light-transmitting proteins of the eye's lens. The damaged proteins clump together clouding the lens. As people age, the enzymes that apparently clear away the damaged proteins become less effective, and cataracts form.

USDA research shows that vitamin C and other "antioxidants" can protect the lens proteins from damage, while magnesium and manganese greatly enhance the ability of certain enzymes to dispose of the damaged proteins. These findings may lead to dietary recommendations that retard formation of cataracts.

## Chromium-Deficient Diets Can Be Harmful

Chromium is far more important than once suspected in maintaining the body's ability to properly metabolize glucose and fats. Long-term deficiency can lead to adult-onset diabetes and cardiovascular disease. Recent chemical analyses show that most American diets are low in chromium.

Many foods with little or no processing—fresh fruits, vegetables, meat, and whole wheat products—provide ample chromium. USDA scientists found that runners excrete large amounts of chromium on days they exercise, indicating a need for high-chromium foods for this group. Also, diets high in simple sugars (glucose, fructose, and sucrose) cause people to lose chromium compared with diets high in complex carbohydrates (starchy foods and vegetables).

## Measuring Body Fat

Body-fat monitoring is gaining popularity in health clubs as Americans become obsessed with the lean look. Some people may, in fact, be harming themselves by reducing too much, shedding necessary fat stores. Women, for example, can become infertile at excessively low body-fat levels.

Generally, men should have a 10-20 percent body fat content and women 20-30 percent, with 15 percent considered the norm for both. Scientists of USDA's Agricultural Research Service are testing the accuracy of several popular new methods for measuring body fat.

## A New Tool for Wheat Breeders

A simple nondestructive flotation technique that requires only water, sugar, and salt can select wheat seeds containing the most protein, according to USDA scientists. Beginning with high-yielding kernels, a breeder can skim off the top 1 percent for protein content by adjusting the solution. The technique is an especially useful tool for wheat breeders in developing countries where laboratory facilities are limited or nonexistent.

## Pesticide Residue Detection Made Easier

A test based on rabbit blood serum can detect pesticides in soil, water, food, and other materials. This simple, inexpensive test, developed by scientists at USDA's Agricultural Research Service, could help government and private agencies monitor pesticides rapidly and accurately. With the help of special equipment, 96 samples can be analyzed in seconds. A totally automated system could analyze 2,000 samples a day.

## Longer Shelf Life for Beef

Predicting the shelf life of hamburger can help meat buyers and sellers ensure high-quality meat. An assay technique has been developed to forecast spoilage based on the amount of lactic acid found in ground beef. Once coarsely ground beef is reground and exposed to air, the bacterial environment changes from predominantly lactic acid-producing bacteria to the kind of bacteria that cause spoilage. The beef is sampled just before it is reground and stored again. Although spoilage during storage of ground beef in the air does not come from lactic-acid producing bacteria, the more lactic acid in the sample initially, the more severe subsequent spoilage. □

# National Food Review Index

*This index covers NFR-15 (Summer 1981) to NFR-31 (Fall 1985). References are coded "Issue Number/Page." Example: 19/2 means issue NFR-19, page 2. Copies of articles are available upon request by writing to the **National Food Review**, 1301 New York Avenue, N.W., Room 1132, Washington, D.C. 20005-4788, or by calling (202) 786-1880.*

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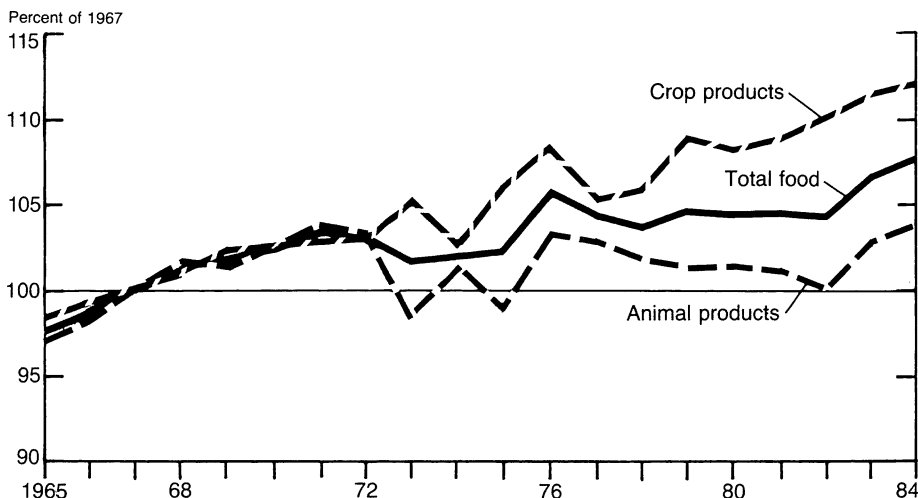
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## Per Capita Food Consumption Index

Per capita food consumption continued slowly upward during 1984, reaching a record high at 7.5% above 1967's level. The relative components of that consumption, however, have changed somewhat over the years (see Karen Bunch's article on page 1 of this issue). Generally, foods produced from crops have shown larger consumption gains than animal products.

### Food Consumption Index Reaches Record High in 1984<sup>1</sup>

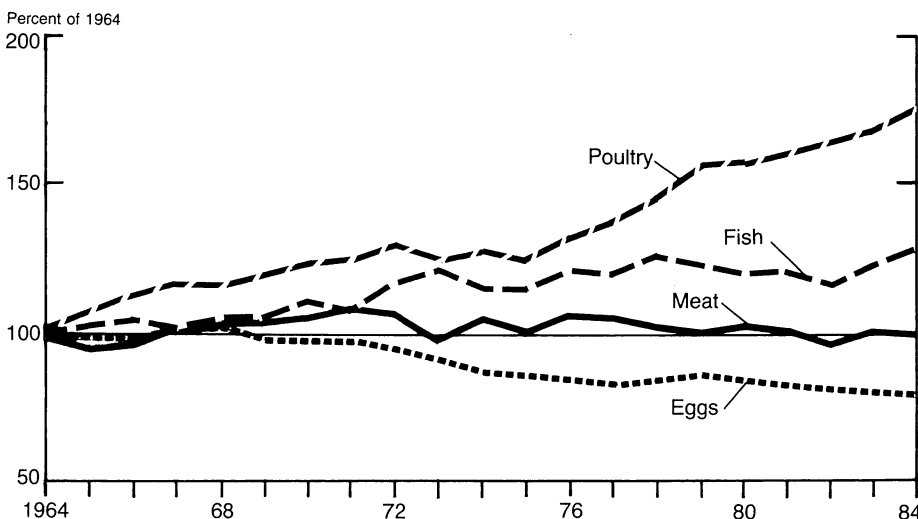


<sup>1</sup>Quantities of individual foods on a retail-weight basis are combined with indices using constant retail prices.

## Meat, Poultry, Fish, and Eggs

Per capita red meat consumption declined slightly in 1984, while poultry and fish continued to make relative gains in American diets. Poultry showed the greatest gain—up 74% since 1964. In 1984, per capita red meat consumption was near its 1964 level, but eggs were down 18%. Fish has shown rapid gains since its last decline of 1979-82.

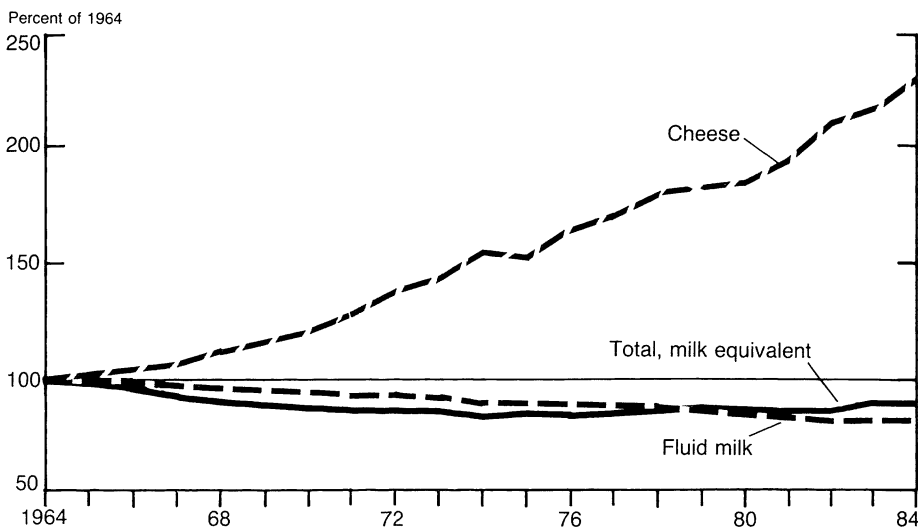
### Per Capita Poultry Consumption Up 74%, Eggs Down 18% Since 1964



## Dairy Products

Per capita cheese consumption continued to rise rapidly in 1984, offsetting depressed fluid milk consumption for a slightly higher total, milk equivalent, dairy product consumption rate. Fluid milk is now at 83 percent of its 1964 level, while cheese consumption has more than doubled.

### Rising Cheese Consumption Counters Declines for Fluid Milk

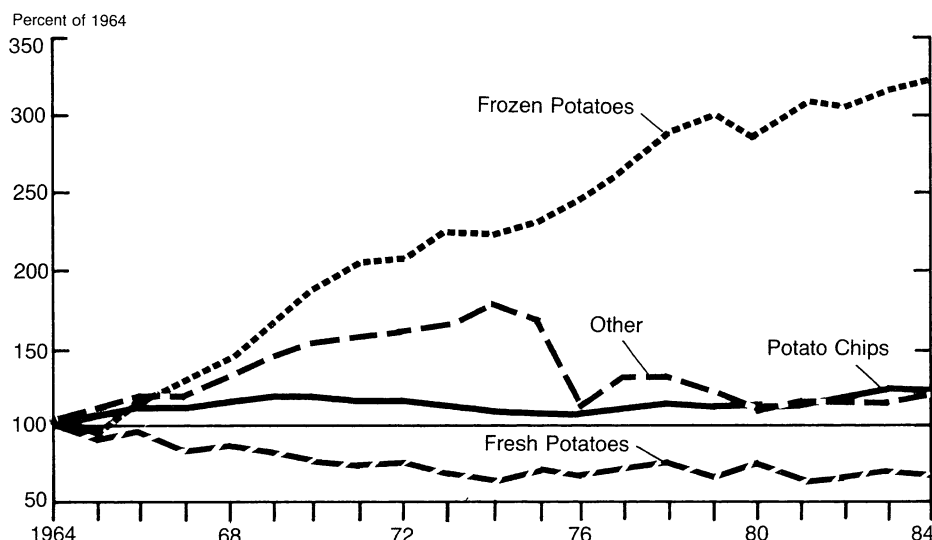




## Potatoes

Frozen potatoes registered the greatest increase of all potato categories over the last 20 years. Per capita consumption in 1984 reached 322% of 1964's level. Potato chips were unchanged in 1984, while "other" potatoes (flaked, etc.) rose slightly but remained well below the consumption levels of 1968-1978. Fresh potatoes were down. Americans, on average, consume about 30% fewer fresh potatoes than they did in 1964.

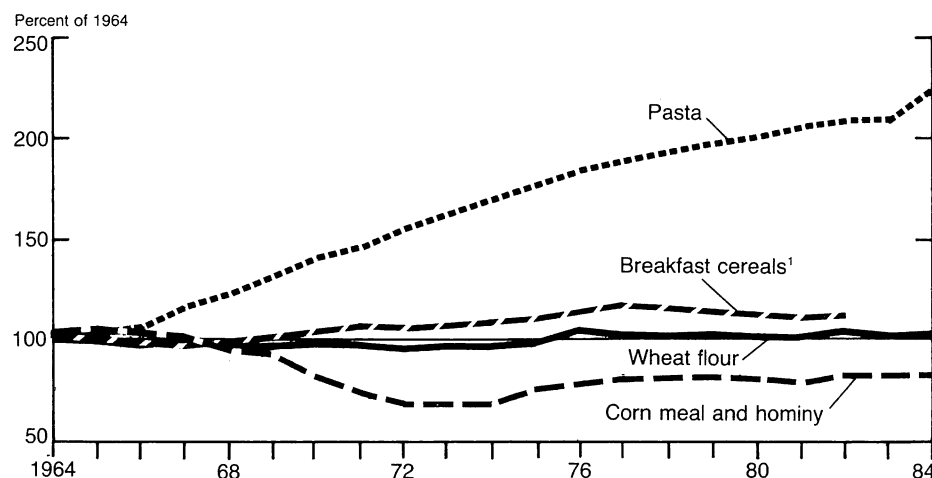
### Frozen Potatoes Show Biggest Gain Since 1964



## Grain Products

Pasta consumption increased 124% per capita during the past two decades and is still gaining rapidly. Consumption of wheat flour, by comparison, has remained very stable over the period. Per capita corn meal and hominy consumption remained unchanged from 1982 to 1984 at 83% of its 1964 level.

### Pasta Continues Its Rapid Consumption Gains

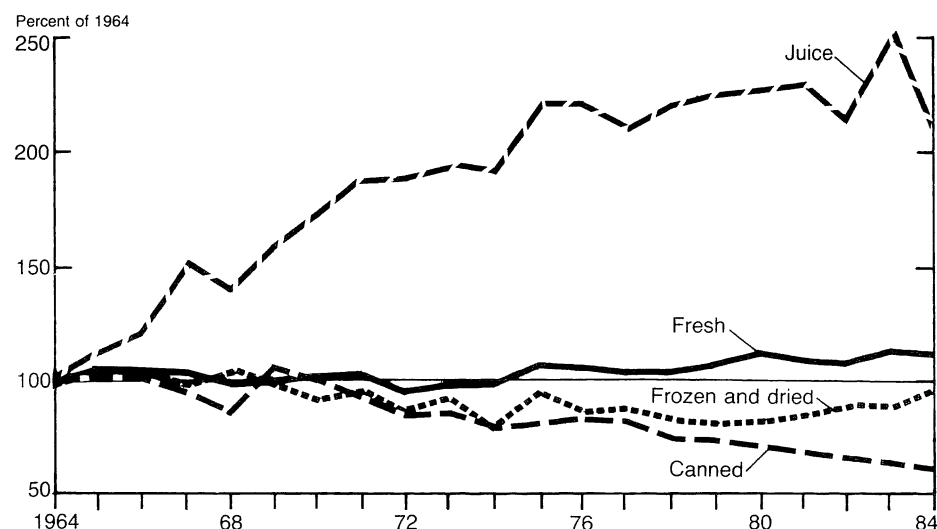


¹Breakfast cereal data not available for 1983 and 1984.

## Fruit

In 1984, fresh fruit consumption per capita dropped slightly but remained more than 10% above 1964's level. Juice consumption declined from 251% of its 1964 rate—a dramatic dip from 1983's record high. Frozen and dried fruit per capita was up slightly, moving from 90% of the 1964 rate in 1983 to 96% in 1984. Canned fruit was down again, slipping to 60% of 1964's per capita consumption level.

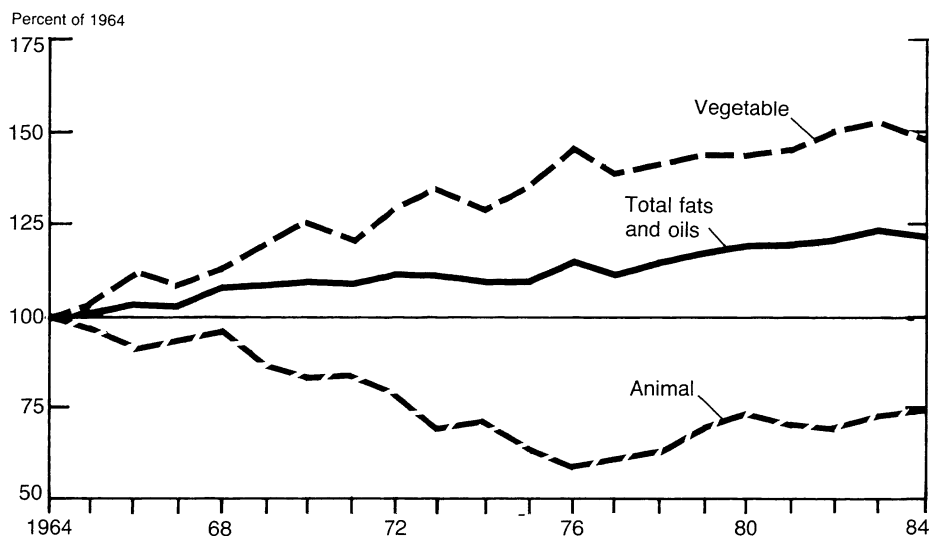
### Juice Consumption Shows Largest Long-term Rise, Followed by Fresh Fruit



## Fats and Oils

Fats and oils consumption per capita turned down slightly in 1984 as vegetable fats and oils pulled down the average. Use of animal fats and oils, while at only three-fourths of the 1964 level, actually moved up slightly on a per capita basis.

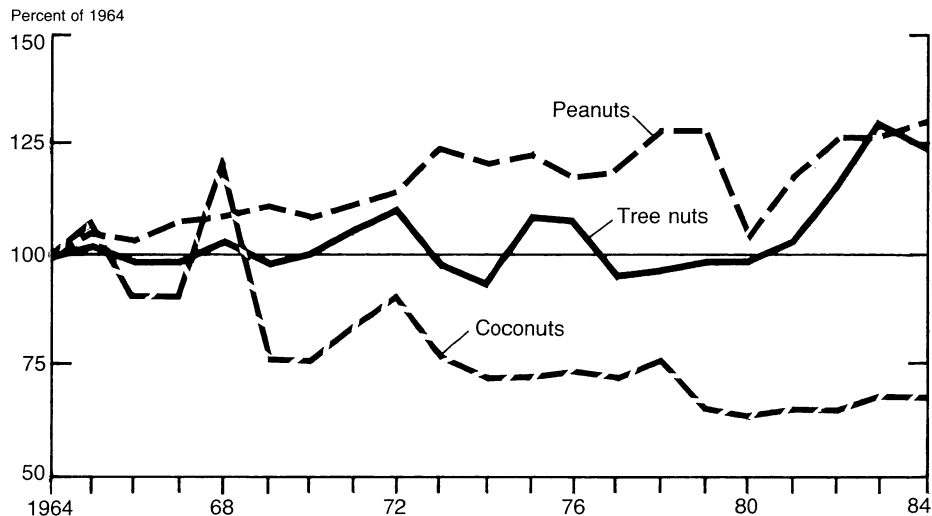
### Vegetable Oil Consumption Takes the Lead Since 1964



## Nuts

Peanut consumption per capita continued its recovery from depressed 1980 levels. Consumption of tree nuts in 1984 was off slightly, while per capita coconut consumption held steady. Per capita consumption of coconuts has declined over 30% since 1964. Peanut consumption has increased 30% since 1964.

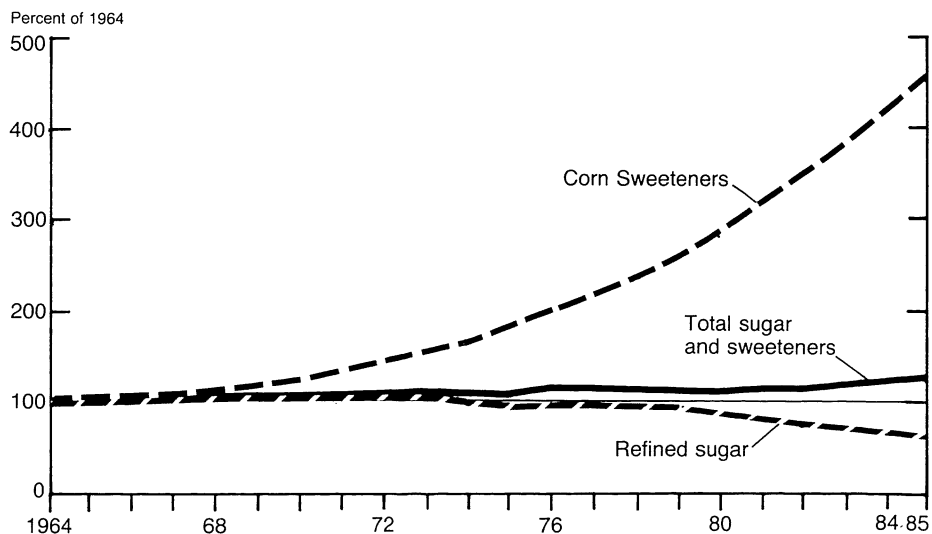
### Peanuts Up in 1984, While Tree Nuts Decline



## Sweeteners

Corn sweeteners have been one of the success stories of the food industry, and the upward growth continued strong in 1985 as per capita consumption reached 464% of 1964's level. Refined sugar has paid the price of corn sweeteners' success, having lost steadily since 1977 and now at less than two-thirds of the level of 20 years ago. Total sugar and sweetener consumption per capita has inched up slowly during the 1980's, and that trend continued in 1984 and 1985.

### Corn Sweetener Consumption in 1985 Was Nearly 500% of 1964's Level







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