AGRICULTURAL OUTLOOK

Statistical Indicators

Farm Cash Receipts To Dip in 1998 . . .

The U.S. agricultural economy in 1998 is edging down from the record-high income in 1996, with performance expected to be slightly below the 1990-97 average. Market receipts are likely to decline to $198 billion from a record $202 billion in 1996 and from $201 billion in 1997, as lower grain receipts reduce the total return to crops. Livestock receipts will decline slightly as lower hog revenues more than offset a small increase for cattle. With overall production expenses declining a little, held in check by lower interest rates and feed costs, net cash farm income is forecast to decline to about $52 billion, more than $2 billion below the average of 1990-97.

Prices of corn and wheat are expected to remain firm in 1998/99. U.S. wheat supplies are expected up only slightly, and for corn, domestic use and exports expand as production increases. Large U.S. and foreign soybean production in 1998/99 is projected to lead to another decline in the season-average farm price. During the first half of 1998, record-high per capita meat and poultry supplies will drive down returns.

. . . While Long-Term Ag Prospects Are Bright, Led by Trade

Strong global trade prospects and a market-oriented domestic agricultural policy combine for a favorable outlook for U.S. agriculture over the next 10 years. In USDA's long-term baseline projections, assumptions of generally favorable global economic growth, combined with liberalized trade associated with the Uruguay Round agreement and unilateral policy reforms, support strong expansion in global trade and in U.S. agricultural exports through the year 2007. Projected economic growth for many developing countries occurs at income levels that can promote increasingly diverse diets and increase demand for meats and other high-value products.

Greater market orientation in the domestic agricultural sector under the 1996 Farm Act puts U.S. farmers in a favorable position for competing in the global marketplace. Strong agricultural demand leads to increased output and strengthening prices, but farm income gains are slightly less than inflation, so real net farm income is down through 2007.

Export markets are the largest source of demand growth for most U.S. crops. Stocks-to-use ratios will tighten for major field crops through 2007, and the historical downward trend in real (inflation-adjusted) crop prices is projected to slow. Record total meat supplies, including an increasing proportion of poultry, are projected through the baseline, with declining real prices for meats.

Precision Ag: Technology for Improved Resource Use

By collecting and analyzing information to tailor production inputs like fertilizers to specific plots within a field, precision agriculture (PA) can improve resource use, increase profits, and reduce environmental impacts of agricultural production. While its promises are attractive, the performance of PA systems remains largely unproven, and its adoption is not yet widespread. Neither the economic nor environmental advantages of PA have been conclusively demonstrated, in part because resource conditions vary so widely from farm to farm and region to region. According to a report by the National Research Council, public functions in PA involve filling critical auxiliary roles—particularly in measurement technology, new approaches to research, and training and education—in an otherwise robust private development of the technologies.

Update on 1998 Food Price Outlook

Consumers are expected to pay between 2 and 3 percent more for food in 1998 than in 1997. If the increase is closer to 2 percent, it could be the smallest rise in the Consumer Price Index (CPI) for food since the early 1990's. Last year's retail food price increase was 2.6 percent.

What determines whether this year's price rise will be closer to 2 or to 3 percent are a number of factors, particularly those affecting the CPI's for meats, and for fruits and vegetables, which account for 19 and 15 percent of the food-at-home index, respectively. For meats, large supplies and dampened prospects for U.S. exports this year will limit price increases. For fresh vegetables, heavy rains in California this past winter are expected to result in periods of short supply and higher prices throughout the spring. Strawberry crops in both Florida and California sustained severe damage from heavy winter rains, and the severity of the price impacts will depend on the duration of the wet weather pattern.

Agricultural Economy

USDA

U.S. Agricultural Outlook for 1998

The U.S. agricultural economy is edging down from the record-high income levels of 1996. In 1998, the overall economic performance is expected to be slightly below the average of 1990-97. Areas of concern continue to be producers in regions affected by bad weather, and some wheat, cattle, hog, and dairy producers who have had to reduce cash balances or incur debt to withstand short-term financial pressures. Farm cash receipts set a record of $202 billion in 1996 and were similar to that level in 1997, with crop receipts rising well above the average of the 1990's and livestock receipts at about the average.

This year, market receipts are likely to decline to $198 billion, as lower grain receipts reduce the total return to crops. Livestock receipts will decline a little as lower hog revenues more than offset a small increase in cattle returns, while dairy remains about unchanged. With overall production expenses declining slightly, held in check by lower interest rates and feed costs, net cash farm income is forecast to decline to about $52 billion, more than $2 billion below the 1990-97 average.

The farm sector balance sheet improved in 1997 as asset values rose more than debt increased. Farm real estate values

have risen every year since the mid-1980's, including a 6-percent increase in 1997. A 5-percent gain is expected in 1998. Farmers will take on more debt, reaching the highest debt level since 1985, but the overall debt-to-asset ratio is expected to decline from 15 percent at the end of 1997 to slightly under 15 percent at the end of 1998 as farm real estate values rise.

Taxpayers will see stability in farm program costs with direct government payments, forecast at $7.4 billion for 1998, down from $7.9 billion in 1997 and accounting for only 3.7 percent of gross farm income. The big drop in farm payments will come for the 2001 crop year when production flexibility contract payments drop nearly 20 percent from $5.05 billion (in 2000) to $4.07 billion.

Consumers will see a year of modest food price inflation in 1998, with the Consumer Price Index (CPI) for food rising 2-3 percent. In 1997, the CPI for food rose 2.6 percent, compared with a 3.3-percent

increase in 1996 when record-high grain and milk prices pushed up retail food prices. In 1998, areas to watch include meats, where retail pork prices are expected to decline by 4-6 percent; ample supplies of beef, poultry, and fruit will also restrain food price increases. The effects of wet weather on spring vegetable harvests in California could also affect vegetable prices (see "Briefs").

Strong Macroeconomy Supports Food Demand

Despite the considerable uncertainty raised by the Asian financial situation (AO February 1998), the U.S. economy looks like it will support strong food demand in 1998. At this point, world economic growth looks like it will slow from 3.1 percent in 1997 to something closer to 2.5 percent. While less favorable for exports, such growth would still be stronger than during the first half of the 1990's, when it averaged 1.9 percent.

In the U.S., after 3.8-percent growth in 1997, this year's real gross domestic product is expected to grow about 2.7 percent. This forecast includes the effects of the Asian turmoil, which trims 0.3 to 0.4 percentage points off U.S. economic growth. A slowdown in corporate profits and business investment in inventories, a tight labor market, and reduced net exports are expected to slow growth. After the U.S. economic surge in 1997 and the Federal Reserve's concern about potential inflationary effects of the tight labor market, it now appears the Asian situation will restrain growth sufficiently without Federal Reserve intervention.

Although the stronger dollar will add to the U.S. trade deficit and limit U.S. economic growth, many other positives will maintain its momentum. Lower long-term interest rates will support investment and construction. Consumer confidence remains near record highs, and inflation is likely to be little changed, held down by

The projections and discussions in this article are drawn from a presentation at USDA's 1998 Agricultural Outlook Forum held in Washington, D.C., on February 23-24, 1998. Near-term numbers reflect official USDA data as of February 23, 1998, the date of presentation at the forum. Long-term numbers were prepared in October-December 1997 and are published in USDA's Agricultural Baseline Projections to 2007, released in February 1998. USDA's 1998 baseline estimates are fully accessible via the Internet at: http://www.econ.ag.gov/epubs/pdf/waob981/

the rising value of the dollar and oil prices that recently hit a 14-year low.

While all of these macro statistics infer a firm base of domestic demand for food, they also bode well for farmers' cash-flow accounts. With energy prices and interest rates down and feed expenses likely down, farm production expenses are forecast to decline for the first time since 1992, when recession was ending, interest rates were falling, and acreage controls were limiting plantings.

Crop Market Developments

A year ago, USDA forecast that large U.S. and world crops of grains, soybeans, and cotton would lead to a softening in crop prices and a rebuilding of stocks. Those forecasts proved fairly accurate as weather was generally conducive to crop plantings and crop development. In addition to large crops, the Asian currency crisis has further contributed to the bearish price outlook for major crops.

Compared with a year ago, the price farmers received for all crops during January 1998 was down 4 percent. However, the price drops have generally been larger for the major crops. The price of corn was down 4 percent, but soybeans and upland cotton were down 8 percent and wheat was down a whopping 17 percent in January.

U.S. and world crop production were generally exceptional in 1997/98. U.S. wheat production (2.5 billion bushels) was the highest since 1990, as wheat yields were record high. U.S. corn production was the third highest on record, reaching nearly 9.4 billion bushels. U.S. soybean production exceeded the record set in 1994/95 by 210 million bushels, as planted acreage topped 70 million acres for the first time since 1982. And cotton production of nearly 19 million bales was only slightly below the record set in 1994/95. Globally, wheat production and oilseed production set records in 1997/98.

Large U.S. and world production of grains, soybeans, and cotton have lowered U.S. crop prices and raised carryover for 1997/98. The U.S. season-average farm price of wheat is expected to be down about 20 percent, and wheat stocks on June 1 are forecast to be up by over 50

Economic Indicators Point to a Generally Healthy U.S. Farm Sector				
	Average 1990-95	1996	1997	1998
	$ billion			
Farm receipts[1]	185	213	213	209
Agricultural exports[2]	44	60	57	56
CCC outlays[2]	10	5	7	9
Government payments	9	7	8	7
Balance-sheet aggregates				
Assets	899	1,035	1,083	1,132
Liabilities	143	156	162	168
Equity	756	879	921	964
	$/acre			
Farm real estate value	742	890	945	1000
Returns[3]				
Corn	174	202	200	195
Wheat	90	112	85	79
Soybeans	138	196	172	125
Cotton	212	304	247	253
	$/cow			
Cow/calf	69	-44	0	13
	$/cwt			
Hogs	6.7	6.0	5.1	-3.6
Chickens	5.3	5.4	5.8	3.5
	$/cwt of milk			
Dairy	2.4	1.9	2.1	2.5

1998 forecast. Dairy data are on a marketing-year basis; all other data are on a calendar-year basis unless otherwise indicated.
1. Includes farm-related income. 2. Fiscal year. 3. For **crops:** returns over variable costs for program participants and soybean producers for crop years; for **cow/calf, hogs (farrow-to-finish), and dairy:** returns over cash costs; for **chickens:** returns over total costs.

Source: Economic Research Service, USDA; Office of the Chief Economist, USDA.

percent compared with 1 year ago. Soybean stocks are forecast to nearly double this season, while soybean prices are expected to be down about 12 percent. Corn prices are forecast to fall by 6 percent in 1997/98 as carryover stocks increase by 7 percent.

Lackluster growth in U.S. exports due to large world crops and the Asian crisis is also contributing to the dropoff in U.S. grain and cotton prices. Both wheat and corn exports are expected to be well below the average of the 1990's. U.S. soybean exports, however, are expected to be record high in 1997/98 as world demand for oilseeds continues to expand.

Despite the decline in corn exports, total corn use in 1997/98 is forecast to be the second largest on record, as domestic use is expected to expand by nearly 9 percent. For corn, growth in domestic use has continued to expand faster than growth in exports. From 1990/91 to 1996/97, domestic use of corn increased by 17 per-

cent while corn exports were up 4 percent. Continued expansion of livestock and poultry production and lower corn prices are forecast to increase feed and residual use by 9 percent and food, seed, and industrial use by 8 percent in 1997/98.

Even though stocks of major crops are expected to increase in 1997/98, stocks will continue to remain at modest levels for most crops, with the possible exception of wheat. The stocks-to-use ratio at the end of the 1997/98 season is forecast to be near 10 percent for corn and soybeans and about 23 percent for cotton. In contrast, the stocks-to-use ratio for wheat—at over 28 percent—would be the highest since 1990/91.

Large U.S. Soybean & Corn Crops Forecast This Year

In 1998/99, changes in relative returns and a 2- to 2.5-million-acre decrease in CRP enrolled acreage is expected to result in a small expansion in corn and soybean

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plantings, while acreage planted to cotton and wheat are expected to decline. Total plantings of major crops will likely be down slightly despite the decline in CRP enrollment, as lower crop prices and returns cause some producers to reduce planted area.

Assuming trend yields, U.S. soybean production is projected to exceed this past year's record, reaching nearly 2.8 billion bushels in 1998/99. Corn production is forecast at nearly 9.8 billion bushels, which would be 5 percent above last year and the second highest on record. But, lower acreage and a decline in yields from last year's record are expected to cause wheat production to fall by 9 percent to 2.3 billion bushels, and reduced planting could lead to a 7-percent decline in cotton production in 1998/99.

Declining foreign production and improved macroeconomic conditions in Asia into next year should enhance export prospects for corn in 1998/99, while large foreign supplies of wheat and soybeans are expected to continue into 1998/99, causing U.S. exports for these crops to remain essentially flat. U.S. corn exports are projected to rebound, reflecting reduced competition, especially from China. China is projected to swing from being a net exporter of corn to a net importer, and Eastern Europe and Argentina are expected to export less.

Prices of corn and wheat are expected to remain firm in 1998/99. For wheat, a small increase in total U.S. supplies is expected to be offset by higher exports and domestic use. The corn market would also appear nearly in balance, with domestic use and exports expanding as production increases. The exception is soybeans, where another record crop and large foreign production in 1998/99 are projected to lead to another decline in soybean prices.

Plantings of rice are expected to rise, reflecting firm 1997/98 market prospects boosted by exports of rough rice to Latin America and continued expansion of domestic demand. Global trade will be strong in 1998, particularly markets in Southeast Asia, including Indonesia and the Philippines where drought has reduced rice production.

Weather—A Key Uncertainty

When will El Niño cease to influence weather and what will the next weather pattern mean for crop plantings and crop development this spring and summer? At this point, all major crop growing areas except the Upper Midwest and Northern Plains have more than ample soil moisture. In fact, if there is a concern, it is whether soils in the Southeast and Southwest will be dry enough at normal planting dates. These areas typically begin planting corn in March, cotton in April, and soybeans in May. The longer that excess moisture delays planting in the South, the more likely producers will shift from corn to cotton and ultimately to soybeans.

Excessive moisture could pose a similar problem for eastern Corn Belt producers, although the current National Weather Service forecast calls for a drier April and May. Delays in planting could leave producers with the choice of planting earlier maturing varieties—with the prospect of lower yield—or switching to soybeans. Further switching of acreage to soybeans combined with the prospect of a record South American crop would soften soybean prices but boost corn prices in 1998/99.

A wet spring followed by a dry summer would support prices for both soybeans and corn, and there are insufficient stocks to prevent major price runups if a severe drought occurs. If current good conditions for winter wheat continue, however, and other crop yields are above trend, the current, somewhat bearish, price expectations could decline further.

The 1998 meat surplus, marginal milk expansion, and relatively low feedgrain stocks make for an uncertain livestock industry. Bad weather this year could cause very high feed prices. That would recommence the cattle herd liquidation and spin dairy returns well into the red. Because hog prices are now 35 percent lower than in 1996 (when cash corn hit $5 per bushel), a runup in corn prices in 1998 due to weather would have a much different effect on hogs than the effect in 1995 and 1996. The hog industry would be severely affected and, with continuing shrinkage in cattle numbers, the meat and milk sectors would face serious dislocations, with consumers facing dramatic retail meat price increases in 1999 and beyond.

Livestock, Poultry, & Dairy Market Developments

The most striking developments in U.S. agricultural markets have been occurring on the animal product side, notably the loss of export growth and the production effects of the cattle and hog cycles. With animal products accounting for 45 percent of gross farm receipts, the economic performance of this sector undergirds the well-being of much of agriculture.

During the first half of the year, record-high per capita meat and poultry supplies will drive down returns for livestock and poultry producers. Consumers will be in hog heaven as they find one bargain after another in the meat case of their supermarket. Per capita meat consumption on a retail-weight basis is expected to surge to an all-time high of 216 pounds in 1998. It was just 202 pounds in 1990 and averaged 208-210 pounds during the mid-1990's.

Obviously, such a high level of consumption can only be accommodated by sharply lower meat and poultry prices. The expected 4.5-percent increase in meat and poultry supplies that will move through domestic channels is being caused by the first decline in U.S. meat and poultry exports in the 1990's, an increase in beef imports (caused by the rising value of the dollar, weak Asian demand, and low cow slaughter), large increases in pork and poultry production, and more beef production than earlier expected.

For 1998, the beef market will see more supplies in the near term but less later on. A key development of 1997 was the continuing liquidation of cattle, a contraction that began in 1995. The pace of cow slaughter began to slow in late 1997 and early 1998, but ranchers will not begin to retain sufficient heifers to rebuild herds, and eventually turn the cycle up, until later this year. Three factors jump out as discouraging expansion—larger-than-

expected supplies of competing meats, weak prices for feeder cattle, and short hay supplies, with hay prices setting a record high for the month of January.

A slowdown in fed-cattle marketings and record slaughter weights have kept beef supplies up, resulting in lower fed-cattle prices than expected. Producers placed large numbers of heifers on feed rather than retaining them for the breeding herds last summer.

Beef production is now expected to be up slightly in first-half 1998, compared with a year earlier. This is keeping fed cattle prices in the low $60's per cwt. With break-even prices in the high $60's, feed-lots are taking a loss of $5-10 per cwt on cattle now coming out of feedlots, which depresses the price they pay for feeder cattle. This will not continue. With fewer cattle on farms, fewer feeder calves will be available to feedlots, and fewer steers will be fed and slaughtered. The question is when.

This is expected to begin later this spring, with retail supplies beginning to decline in the fourth quarter, and could go on through the year 2000. In 1996, beef production was up 1.2 percent. In 1997, beef production was unchanged, and in 1998, USDA forecasts a decline of less than 1 percent, although the drop in production will grow as the year unfolds and could be down 3 percent by the fourth quarter. The conclusion then is fed-cattle prices will rise and feedlots will have to pay more for feeder cattle.

By late 1998, fed cattle could be over $70 per cwt, 20 percent above recent levels, and feeder cattle could be in the low $80's, compared with the mid-$70's recently. This will mean better news for cow-calf producers. By 1999, returns to cow-calf producers should be strongly positive, and that would provide an incentive to rebuild herds, though this outcome hinges on good crops this year.

Pork supplies will be especially heavy in 1998 as a 10-percent increase in production is expected to combine with export losses and pull down 1998 hog prices a whopping 25 percent below the 1997

U.S. Poultry and Pork Production To Rise in 1998

Billion lbs.
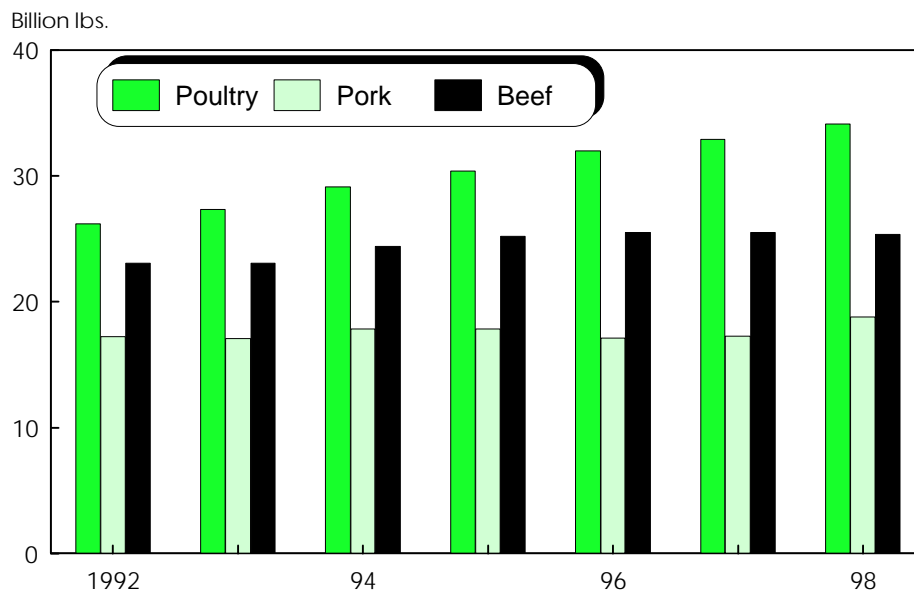
1998 forecast.
Economic Research Service, USDA

average. One key development has been the pattern of expansion. Many States are continuing to pursue "moratoriums" on hog expansion and restraints on production (AO March 1998). Consequently, observers are trying to discern whether environmental, structural, or other issues will restrain future hog expansion. Some traditional producing States such as Iowa and Minnesota are expanding faster than the U.S. average, as are Oklahoma, Texas, Utah, and Colorado. North Carolina is below the U.S. average.

Broiler returns were reasonably good during 1997 and have remained above cash expenses even during the period of weak wholesale broiler prices experienced this quarter. Export growth will be slower in 1998 but still positive as Russia, Hong Kong, China, and Japan continue as major buyers. For 1998, USDA forecasts that production will rise 4 percent, and with abundant meat supplies, broiler prices are expected to average only 56 cents per pound, compared with 59 cents during 1997.

Last, the dairy market has been recovering since the very low prices during the first half of 1997. Strong cheese and butter

prices pulled the basic formula price (BFP) for January 1998 to the second highest ever for that month. Nevertheless, the milk-feed price ratio is not strong enough to signal milk production expansion, and low dairy-quality hay supplies remain a concern. Consequently, milk production is expected to be about unchanged in 1998 compared with 1997. A good economy and expanding demand will keep milk prices firm, with the all-milk price expected to average slightly above the 1997 level.

One uncertainty is the outcome of the Federal Milk Marketing Order hearing to establish a floor on milk used for Class I and Class II products. Because milk prices are seasonal and likely to go lower over the next several months, a floor, if established, would raise producers' returns above current projections. For example, a $13.50-per-cwt floor on the BFP could raise the farm-level milk price during the second half of 1998 by 25-35 cents per cwt above what it would otherwise be. However, because the floor is expected to be temporary, production would likely be affected little.

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Specialty Crops

Rains & Freezing Temperatures Damage Horticultural Crops

Heavier-than-normal rains this past winter have caused large losses to fruit and vegetable growers in California and Florida. The strawberry crop was hit hardest, with damage in California estimated at $23 million and in Florida between $10 and $12 million. The major price impact of the winter deluge will be felt this spring, as vegetable and strawberry marketings may be sporadic due to planting delays, slowed growth, or the need to replant.

The steady pattern of storms throughout February slowed fieldwork considerably in both States. With little time between storms for fields to dry out, growers were hard-pressed to complete cultural work and plant spring crops. This includes both fresh-market vegetables like lettuce, broccoli, and tomatoes, and processing crops like tomatoes and spinach. In addition, late-February rains in California reduced the activity of bees during pollination of almond trees, which may reduce output. A continuation of this wet weather pattern into the spring could lead to more serious supply problems (due to increased incidence of plant diseases as well as planting and harvest delays) and large fluctuations in market prices for spring vegetables, summer stone fruit, and nuts.

Strawberries for winter and early spring shipment are grown in southern and central California and in Florida, regions that have experienced heavy storm damage this winter. The rains disrupted production and harvesting activities in both States. In California, growers stripped a lot of moldy and decayed strawberries off the plants. Lower fruit quality increased the amount of strawberries sent to processing rather than to the fresh market. According to the Florida Strawberry Growers Association, harvested volume was lower than expected around Christmas, when demand is normally strong. Moreover, heavy rains reduced Florida volume again in February.

If the weather should clear up in both States during March when all producing areas will be harvesting, a strawberry glut could occur whereby product from both California and Florida (which normally ships first) could flood the market at the same time, dropping prices. A seasonal strengthening of demand during the Easter season could mitigate the plunge in prices.

For fresh vegetables, periods of short supply are expected to elevate prices throughout the spring. During the first half of 1998, retail prices for fresh vegetables are likely to average about 10 to 15 percent higher than a year earlier. In contrast, large citrus crops this year have kept retail prices down, although the storms have caused some delays in harvesting. Lower retail prices for fresh oranges are expected to continue throughout 1998. Citrus fruits, the major U.S.-produced fruit in the market during the early portion of the year, were already developed by the time the stormy weather began. Citrus fruits are less susceptible to storm damage because the fruit is protected by a thick skin and by the tree.

The rains have hampered harvesting activities for oranges in Florida and California, where growers expect large crops. Shipments to Florida processors through mid-February, however, exceeded the previous year by 4 percent. Grapefruit production is down this year from last year, and slower movement this winter is a result of both harvesting delays and reduced exports. The heavy rains provide a perfect environment for diseases and fungi. In addition, saturated soil can weaken tree roots. These conditions stress the trees and could affect crop production and increase tree loss in future years. Any damage to tree crops may take several years before it becomes evident.

Three consecutive days of freezing temperatures in mid-March could significantly reduce the peach crop in the southeastern U.S. Earlier-than-normal blooms for the early-variety peaches, induced primarily by warm temperatures, were among those heavily damaged by the frigid temperatures. The extent of crop damage in the region is unknown at this point.

Increases in produce prices are not expected to be as severe in 1998 as in 1995 when California fields were washed out. Heavy spring snow melt in 1995 caused severe flooding, causing an estimated $652 million of damage to California's fruit and vegetable crops, with the severest losses in the almond, strawberry, plum/prune, lettuce, and wine grape crops. During the spring of 1995, shipping-point prices for all fresh-market spring vegetables averaged 56 percent above year-earlier levels. Retail vegetable prices then rose 25 percent, and strawberry prices rose 13 percent.

Likewise, in 1982/83, also a strong El Niño year, heavy winter rains forced spring-1983 fresh vegetable prices 14 percent above the previous year. Prices for celery, broccoli, cucumbers, peppers, and tomatoes peaked in early spring, while lettuce prices peaked a bit later. A similar scenario may develop this year. However, it could be exacerbated by higher prices for potatoes, onions, and cabbage due to lower stocks and strong exports. In 1983, lower prices for these three high-volume vegetables helped limit the increase in spring-season retail vegetable prices to just 3 percent above the previous spring.

Vegetable growers can take several steps to augment the supply of spring produce. For example, when inclement weather forces delays in planting, direct seeding can be bypassed to save time. Some growers elect to start seeding cauliflower, broccoli, and tomatoes in greenhouses and set the young plants in the ground by hand when fields dry out.

Also, some of the larger firms can increase their acreage in other areas, States, or even other countries when conditions warrant. Lettuce acreage is reportedly up this year in New Mexico and Arizona, normally minor producing States during the spring. Responses such as these raise grower costs but benefit consumers by steadying supply and moderating prices.

This past winter, supplies of leafy vegetables remained strong because the majority of these vegetables are grown in the desert valleys of California (Imperial) and

Where Are U.S. Vegetables Grown in the Spring?

Asparagus
Strawberries

Strawberries

Asparagus
Broccoli
Carrots
Cauliflower
Celery
Lettuce
Melons
Onions
Sweet corn
Strawberries
Tomatoes

Asparagus

Asparagus
Cabbage
Escarole/endive
Lettuce
Snap beans
Strawberries

Lettuce
Melons
Onions

Lettuce

Snap beans
Tomatoes

Cabbage
Onions
Tomatoes

Cabbage
Carrots
Cucumbers
Melons
Onions
Peppers
Tomatoes

Tomatoes

Tomatoes
Watermelon

Cabbage
Carrots
Cucumbers
Eggplant
Escarole/endive
Peppers
Snap beans
Sweet corn
Tomatoes
Watermelons

Total spring vegetable area

- > 100,000 acres
- > 40,000 to 100,000 acres
- > 15,000 to 40,000 acres
- Up to 15,000 acres

Excludes potatoes.
Economic Research Service, USDA

Arizona (Yuma). Imperial is one of the few counties in California that was not declared a disaster area, since rain there was much less intense. Crops like lettuce, broccoli, and cauliflower remained in good condition and good supply during the rainy period.

The brunt of the winter storms hit the coastal areas of California (e.g., Ventura, Santa Barbara, and Monterey counties), which produce a smaller percentage of winter vegetables. Despite the heavy storms, many growers in these coastal areas were able to resume harvest activities for crops like broccoli and cauliflower after short delays to wait for fields to dry out. However, some growers lost crops or received lower prices because rain reduced the quality and marketability of items like broccoli, cauliflower, and leaf lettuce.

Most warm-season vegetables like tomatoes, peppers, and snap beans come from Florida and Mexico—not California—during the winter. Although there has been no freeze in 1998, Florida growers have also had to contend with drenching rain and cool temperatures this winter.

With tomato acreage up this year, Florida's shipment volume has been above that of a year ago, when a severe freeze limited output. Tomato and green pepper volume from both Florida and Mexico was good in January, with shipping-point prices for tomatoes averaging about $7 per 25-pound box. However, by mid-February, prices had jumped to more than $16 per box as ship-

ments from Mexico slipped and cool weather in Florida slowed growth.

Reduced Mexican volume was expected this winter due to a rare December freeze in west Mexico, which caused tomato and pepper plants to drop more than a third of their blossoms. Most warm-season vegetables were affected by this freeze, eventually reducing import volume late in January and into February. Import volume improved in March and helped limit price increases during the transition to spring-season growing areas.

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U.S. Horticultural Trade: Long- & Short-Term Factors

Export markets continue to be a major source of growth in U.S. horticulture. Exports as a share of horticultural production value grew from 20 percent in calendar-year 1990 to a forecast 28 percent in 1998, and will likely continue to grow during the next decade. U.S. horticultural exports are forecast to reach a record $10.8 billion in 1998, up 7 percent from 1997 and nearly double the level of 1990.

Despite the large growth in exports in this decade, the U.S. remains a net importer of horticultural products. As U.S. consumers have become more willing to try new fruit and vegetable varieties, the import share of domestic horticultural consumption has increased, particularly for fresh produce. The fresh-market import share of total U.S. fruit and vegetable consumption, in volume, increased from 18 to 21 percent (excluding bananas, the share grew from 9 to 13 percent). The value of total horticultural product imports grew more than 50 percent since 1990.

If long-term projections hold for the next decade, the U.S. could achieve a trade-balance surplus in horticultural products, fueled mainly by global income growth. While the import value of horticultural products is projected to grow at a steady rate of 4 percent per year between 1998

and 2007—USDA's baseline projection period—exports are projected to grow 5-7 percent per year.

Trade Propelled by Increased Global Income & Market Access

Fruit and vegetables will account for 98 percent of total horticultural export value on average during the baseline period; greenhouse and nursery products constitute the remaining 2 percent. Underlying long-term factors in the outlook for U.S. fruit and vegetable trade include income growth in customer nations and enhanced global market access stemming from trade liberalization. Also at work are short-term factors such as changes in U.S. dollar exchange rates, which intermittently enhance or hinder U.S. trade prospects. The effects of trade impediments and of productivity changes due to technological innovations may be long-or short-term.

Global economic growth will fuel export demand for U.S. fruit and vegetables beyond 2001; as countries become wealthier, their demand for high-valued commodities increases. The effects of income growth on consumption are more pronounced in developing countries which, compared with developed countries, are expected to spend larger shares of

additional income on food items like meat and fruit and vegetable products. Moreover, economic growth projections for most developing countries are higher than the world average over the baseline period.

Developing countries account for an increasing share of U.S. fruit and vegetable exports. Hong Kong, Taiwan, South Korea, Indonesia, Thailand, and the Philippines will remain important purchasers of U.S. fruit and vegetables despite their current financial problems. South America is another developing region where growth in U.S. fruit and vegetable exports has been strong in the 1990's. Annual average economic growth in this region is projected to double during the baseline years from the 1990-96 average.

International trade agreements have increased *market access* for specific fruit and vegetable products, which will stimulate future export growth in the U.S. fruit and vegetable industry. Last year, mainland China opened its market to California fresh table grapes and Washington cherries, and Japan permitted entry of most major varieties of U.S. fresh tomatoes. China continues to ban the importation of most U.S. fruit, citing phytosanitary concerns. It was because of phytosanitary concerns that the Japanese market had been closed to U.S. fresh tomatoes until the summer of 1997.

Tariffs on fresh table grapes and cherries to China and on tomatoes shipped to Japan remain high, and these new markets still need to be developed. But signs of their strong market potential include China's projected per capita growth in GDP of over 8 percent annually over the next decade; the steps China has taken to reduce import duties on a wide range of horticultural products including fresh grapes and cherries; China's enormous population base, the largest in the world; and Japan's rapidly growing western-style foodservice industry.

In the short run, the outlook for U.S. fruit and vegetable trade is clouded by *currency devaluations in Asia* since late-summer 1997, particularly in Southeast Asia,

Horticultural products encompass fruit and nuts (including juice and wine), vegetables (including potatoes, dry beans, and mushrooms), and greenhouse and nursery products. Essential oils and ginseng are not included.

South Korea, and Japan. In countries with depreciating currencies, U.S. products are generally priced relatively high compared with domestic goods, dampening demand for U.S. commodities in these markets. Meanwhile, exports from these countries will be priced competitively in the U.S. and other markets.

Because many U.S. horticultural exports are not staple items in the diets of most developing Asian countries, consumers there are more likely to substitute local goods or even to do without, particularly for commodities such as fresh fruit, wine, and nuts. U.S. exports of a number of fruits and vegetables to Asian countries from September to December 1997 were lower than shipments during the same period in 1996, with fresh grapes, almonds, and frozen potatoes among the exceptions. Even before the financial crisis in Southeast Asia, the Japanese yen had depreciated, accounting for much of the decrease in Japan's imports of U.S. fruit and vegetable exports during the past 2 years.

But Japan's imports of frozen potatoes declined neither in volume nor value in 1997, due likely to strong Japanese demand for french fries. Frozen potatoes are top among U.S. fruit and vegetable products exported to this market. Also, record U.S. production of grapes and almonds in 1997 resulted in lower prices for these commodities, and along with high quality, helped the U.S. maintain competitiveness in the Asian market.

The Southeast Asian market, although a relatively small outlet for U.S. fruit and vegetables, grew from 3 percent of U.S. fruit and vegetable exports in 1990, in value terms, to about 5 percent in 1997. South Korea is also a small U.S. market, while Japan accounted for approximately 17 percent of total fruit and vegetable export value in 1997, about the same as in 1990. Once the financial conditions improve in these Asian countries, U.S. fruit and vegetable exports will likely resume their strong performance.

Fluctuations in world supplies also affect U.S. exports—and imports—in the short run. Supply fluctuations are usually unpredictable and in most cases are due to weather, such as the effects of the El Niño phenomenon. The overall impact of El Niño on 1998 fruit and vegetable produc-

U.S. Horticultural Production and Exports To Continue Growing
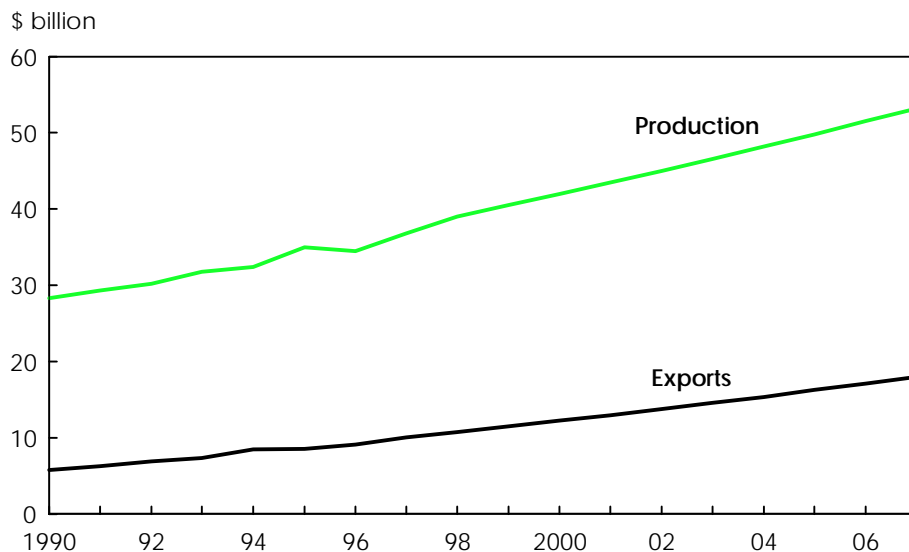
$ billion

Selected major fruits and vegetables: almonds, fresh apples, fresh oranges, fresh grapes, frozen potatoes, fresh lettuce, fresh tomatoes. 1998 forecast, 1999-2007 projected.
Economic Research Service, USDA

Foreign GDP Influences Growth in U.S. Fruit and Vegetable Exports
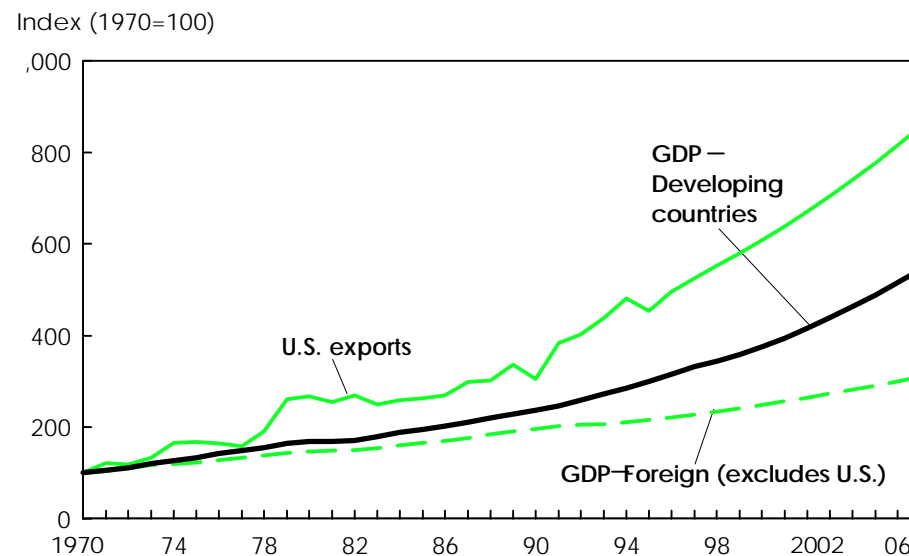
Index (1970=100)

Selected major fruits and vegetables: almonds, fresh apples, fresh oranges, fresh grapes, frozen potatoes, fresh lettuce, fresh tomatoes. 1998 forecast; 1999-2007 projected.

Economic Research Service, USDA

tion could generate some downward adjustment in the export forecast.

The effects of *trade barriers* that diminish export opportunities for U.S. fruit and vegetable producers could be long- or

short-term. Natural trade barriers include high transportation costs to distant markets, and artificial barriers include legal measures such as protectionist policies. Liberalization of trade through international agreements has been instrumental

Commodity Spotlight

Developing Countries Account for Increasing Share of U.S. Horticultural Exports
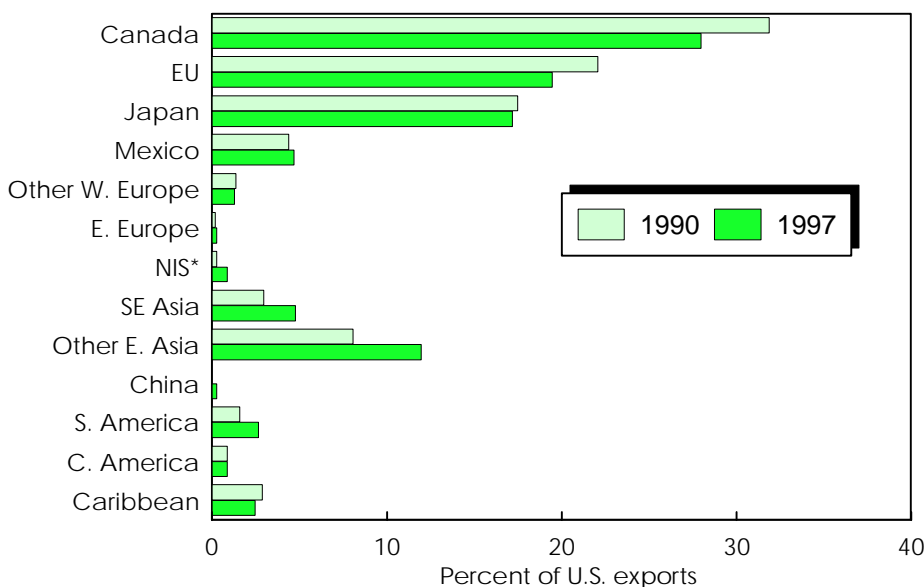
Percent of U.S. fruit and vegetable export value. 1998 forecast; 1999-2007 projected.
*Newly Independent States of the former Soviet Union.
Economic Research Service, USDA

in relaxing many legal trade barriers by reducing tariffs and by harmonizing the technical barriers to trade.

Under phytosanitary requirements—technical trade barriers—importing countries set standards that potential trade partners must meet, presumably to protect human health or prevent the spread of pests and diseases. For example, Japanese imports of U.S. apples are limited to Red and Golden Delicious apples from Washington and Oregon. The Japanese, concerned mainly about the spread of fire blight, impose rigorous and costly import requirements on U.S. apple shippers. The Japanese require cold treatment and fumigation with methyl bromide before shipment, and inspection of U.S. apple orchards three times during the production stage—U.S. growers intending to export to Japan must register the acreage. These requirements are apparently having an impact. None of the Washington and Oregon growers have registered acreage for the 1997/98 export program, and no U.S. apple shipments to Japan are expected this season.

In June 1997, Brazil imposed a mandatory fumigation-at-origin requirement for all U.S. fruit entering their market, following detection of the Pacific spider mite in

recent shipments. By the end of July, Brazil agreed to limit this fumigation requirement to peaches, nectarines, and apricots. The sharp growth in U.S. fresh fruit exports to Brazil in the 1990's is attributed mainly to increases in key items such as apples, pears, peaches, and plums. Prospects for future stone fruit exports to this market could be dampened if the mandatory fumigation-at-origin requirement remains in effect.

Technological innovations can increase a country's competitive advantage and therefore its world market share if they enable higher quality or promote lower prices. But because new technologies can be exported, any gains in export market shares may be short-term.

Mexico's tomato export sector, producing mainly in the Sinaloa and Baja California regions, has imported U.S.-initiated production technology over the last few years, including the adoption of extended shelf-life (ESL) varieties. These varieties, used in Florida for the past 20 years, are far less suited to Florida's climate than to Mexico's and have boosted Mexico's tomato export capacity significantly. The peso crisis in 1995 provided additional incentive in the short run for Mexican producers to export to the U.S. To increase

competitive advantage in the long run, U.S. producers will have to adopt ESL varieties suited to Florida's climate and change harvesting and marketing practices to accommodate ESL varieties.

Safety concerns have heightened among U.S. consumers about produce available in the U.S. market. Two recent food scares in the U.S. involved imports of raspberries from Guatemala and frozen strawberries from Mexico. Fresh fruit and vegetable imports are a large and growing share of total U.S. fruit and vegetable imports. Undertakings to improve food safety standards both in the U.S. and in the countries that supply produce to the U.S. are critical in maintaining consumers' confidence and their demand for fruit and vegetables. An example of such an undertaking is the Administration's legislative initiative to halt imports of fruits and vegetables from countries with inadequate safety standards.

U.S. Export Prospects In the Decade Ahead

Long-term prospects for U.S. horticultural trade appear good, with a trade surplus possible by the end of the next decade. Exports will continue to be a primary source of growth for the industry. Projections for only slight increases in domestic fruit and vegetable consumption over the next decade underscore the continued importance of export demand in raising producer earnings.

Export growth will be driven mainly by world economic growth, particularly in developing regions, and by international agreements to liberalize global trade. The Asian financial crisis will likely result in diminished demand for a number of U.S.fruit and vegetable products in that region in the short run. But because of the strong export growth to Asia during most of the 1990's, and projections of higher economic growth in the region than in the world overall, Asia will remain an important market for U.S. fruit and vegetables, particularly with the emergence of new markets such as China. Similarly, increased economic growth in other developing regions, such as South America, will help expand market opportunities for U.S. exports.

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Free Trade Area of the Americas: Potential Advantages For U.S. Agriculture

At the Second Summit of the Americas scheduled for April 1998 in Santiago, Chile, formal negotiations are set to begin on formation of a Free Trade Area of the Americas (FTAA) by the year 2005. President Clinton and the leaders of 33 other Western Hemisphere nations had pledged to negotiate an FTAA at the initial summit held in Miami in December 1994.

The Americas include key markets for U.S. agricultural exports, major suppliers of agricultural imports for the U.S. market, and strong U.S. competitors in certain agricultural markets. U.S. interest in forming an FTAA stems in part from the broad goal of fostering economic and political stability in the hemisphere and also from the desire to secure more open and transparent rules for U.S. trade and investment in the rapidly growing markets of Latin America (*AO* March 1998, January-February 1997).

Analysis by USDA's Economic Research Service (ERS) indicates that for the U.S. agricultural sector, both exports and imports would be higher with U.S. membership in an FTAA, and exports and imports would be lower if an FTAA were

formed that excluded the U.S. While U.S. membership would result in a net addition in the value of agricultural imports (the additional imports would exceed additional exports), the ERS analysis demonstrates that an assessment of trade agreements simply in terms of net trade flows can be misleading; in terms of farm income, the U.S. agricultural sector would be slightly better off within an FTAA than outside it.

The U.S. has played an active role in preparations for FTAA negotiations. How the FTAA evolves—and particularly, whether or not the U.S. joins—may have important implications for the U.S. economy. But pending congressional approval of "fast track" negotiating authority for the administration, the other prospective FTAA members would not likely be willing to negotiate because without this authority, the U.S. Congress could change elements of the agreement before ratification (*AO* November 1997).

The Americas As Trade Partners

Agricultural trade in the Americas is governed by an increasingly complex network of regional trade agreements as well as

the parameters of World Trade Organization (WTO) rules. About 40 regional and bilateral agreements are operating in the Americas, and at least another dozen are currently under negotiation. Almost every country in the hemisphere belongs to one or more comprehensive regional trade agreements, and several countries, notably Chile, maintain extensive networks of bilateral agreements. The hemisphere's five most comprehensive agreements are the North American Free Trade Agreement (NAFTA), the Mercado Común del Sur (MERCOSUR), the Andean Group, the Central American Common Market (CACM), and the Caribbean Community and Common Market (CARICOM).

For every regional group in the hemisphere except the Southern Cone, or MERCOSUR (Argentina, Brazil, Paraguay, and Uruguay, with Chile and Bolivia as associates), the U.S. is a critical source of agricultural products. Total U.S. agricultural exports to Western Hemisphere nations in 1997 amounted to slightly over $17 billion, or about 25 percent of all U.S. agricultural exports. The U.S. supplies 66 percent of agricultural imports for its NAFTA partners Canada and Mexico, 48 percent for Central America, 35 percent for the Caribbean, and 27 percent for the Andean Group (Bolivia, Colombia, Ecuador, Peru, and Venezuela). Only 11 percent of MERCOSUR's agricultural imports come from the U.S.

U.S. market shares for most commodities follow the same general order—highest in NAFTA, followed by Central America, the Caribbean, and the Andean Group, with the lowest U.S. shares in MERCOSUR. But the *magnitude* of U.S. market shares varies considerably by commodity. For example, U.S. producers supply more than 65 percent of the hemisphere's imports of poultry, coarse grains, and oilseeds, but less than 15 percent of dairy product and raw sugar imports.

The hemisphere is also a key source of U.S. agricultural imports, supplying about 50 percent of the U.S. total, valued at $19.7 billion. NAFTA partners alone supply 30 percent of U.S. agricultural imports, with 20 percent split fairly evenly among Central American, MERCOSUR,

World Agriculture & Trade

Nearly Every Western Hemisphere Nation Belongs to a Major Trade Bloc

Canada

U.S.

Mexico

Central America

Caribbean

Venezuela

Colombia

Ecuador

Peru

Brazil

Bolivia*

Paraguay

Uruguay

Chile   Argentina

- NAFTA
- Andean Pact
- MERCOSUR
- MERCOSUR associates
- CACM and CARICOM

*Bolivia is member of the Andean Pact and
an associate member of MERCOSUR.

Economic Research Service, USDA

and Andean countries. The Caribbean supplies only about 1 percent of total U.S. agricultural imports—primarily sugar.

Measuring the Effects Of an FTAA

Economists classify regional trade agreements as "second best" policies because, unlike global agreements, regional agreements discriminate between members and

outsiders. By reducing or eliminating trade barriers among a group of countries, a regional agreement may open new trade channels in goods which the members produce cheaply and efficiently. This is called "trade creation." When trade creating liberalization occurs, capital and other resources used in production are reallocated toward more efficient uses—e.g., toward crops that grow well in a particular climate, or toward industries that are

competitive. This raises returns on investments and improves the overall economic well-being or "welfare" of the members. This welfare gain can increase members' demand for all goods—including goods made by outsiders—providing an additional boost to global economic welfare.

On the other hand, if a regional agreement shelters high-cost producers within the group and excludes lower-cost goods from outside the area, this is called "trade diversion." Trade diversion leads to less efficient allocation of resources in the global economy, and directly harms countries outside the agreement. It may, if severe enough, even hurt members. If the trade diversion is not too severe, however, it may benefit members more than it hurts outsiders, so that the net effect on the world economy is positive.

A particular trade agreement, like the FTAA, is likely to have both trade-creating and trade-diverting effects. Whether the agreement is beneficial—for members, outsiders, or the world as a whole—depends on which effect dominates.

As a member of a hemispheric FTAA, the U.S. would be likely to increase trade with other countries in the hemisphere. Productive resources would be reallocated within the U.S. economy toward more competitive sectors as producers take advantage of the new export opportunities. Rising imports would challenge the less competitive sectors and further encourage the reallocation of resources toward more competitive sectors. While the less competitive sectors of the U.S. economy would decline in an FTAA, gains in the competitive sectors would more than offset those losses.

As an outsider, the U.S. could be helped or hurt by formation of an FTAA. If trade creation dominates, the resulting improvements in economic efficiency and welfare for the members could increase trade with outsiders as well. In this case, the U.S. would be expected to benefit even as an outsider. On the other hand, if trade diversion dominates and U.S. exports are blocked, the U.S. would clearly be hurt.

Because economic theory alone cannot determine how a particular agreement might affect the U.S. economy, empirical

Trade Agreements in the Americas

The largest and most comprehensive regional trade agreement in the hemisphere is the North American Free Trade Agreement (NAFTA) among the U.S., Canada, and Mexico. Under NAFTA, which went into effect January 1, 1994, the member nations have eliminated almost all agricultural trade barriers among themselves, with the more sensitive barriers with Mexico being phased out by 2008.

The MERCOSUR agreement among Argentina, Brazil, Paraguay, and Uruguay is second to NAFTA in total population and gross domestic product of member nations. MERCOSUR began in 1991, and by 1995 it had eliminated almost all agricultural trade barriers among members, although certain products are being gradually liberalized. The few remaining barriers for agricultural trade among MERCOSUR members will be phased out by 2013—except for sugar, which is still under negotiation.

The MERCOSUR countries adopted a common external tariff for most agricultural products in 1995, with longer transition periods for sensitive products. The common external tariff is less than 20 percent for most agricultural products, with an average of about 14 percent. MERCOSUR is expanding rapidly, having added Chile and Bolivia as associate members in 1996, and potential agreements with many other countries in the region—including Canada, Mexico, and the Andean Group—are under discussion.

The Andean Pact among Bolivia, Colombia, Ecuador, Peru, and Venezuela was established in 1969 and was revived as the Andean Group in the early 1990's. The Andean Group is adopting a common external tariff for products from non-member countries, consisting of four tariff levels: 5, 10, 15, and 25 percent. However, Bolivia requested and has been granted permission to apply only the two lower tariff rates, and Peru applies only the two higher tariff rates.

Andean Group countries also apply a price band system for many agricultural imports, so applied tariffs may be adjusted up or down to compensate for variations between international and domestic prices. Products covered by the system are palm oil, soybean oil, rice, sugar, barley, milk, corn, soybeans, wheat, chicken, and pork. As noted above, Bolivia reached a bilateral agreement with MERCOSUR in 1996, and the rest of the Andean Group is currently negotiating with MERCOSUR.

The Central American Common Market (CACM) and the Caribbean Community and Common Market (CARICOM) encompass most of the remaining countries in the hemisphere. Like the Andean Pact, the CACM and CARICOM agreements were moribund for many years following their beginnings in the 1960's, before being revitalized in the early 1990's.

The CACM—among El Salvador, Guatemala, Honduras, Nicaragua, and Costa Rica—seeks to eliminate trade barriers among members and to establish a common external tariff of no more than 15 percent for final goods and to 0 percent for raw materials. CARICOM—among Antigua, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts-Nevis-Anguilla, St. Lucia, St. Vincent, and Trinidad and Tobago—has similar goals, but is moving more slowly than the CACM.

By 1995, the CACM had eliminated barriers on internal trade for all but seven agricultural products. The CACM's progress in establishing a common external tariff has been uneven, with El Salvador moving more quickly than the other members. External tariffs for agricultural products currently range from 0 to 20 percent, with about half of all agricultural products carrying the highest rate.

The three NAFTA signatories have a number of preferential arrangements with other countries in the hemisphere. The U.S. grants preferential access for agricultural imports from most of the smaller economies in the region under nonreciprocal agreements such as the Caribbean Basin Initiative and the Andean Trade Preference Act. These agreements offer preferential access to the U.S. market for most countries in the hemisphere with the important exceptions of Argentina, Brazil, and Chile.

Canada also provides trade preferences for most of the smaller countries in the hemisphere, has a bilateral agreement with Chile, and is negotiating a bilateral agreement with MERCOSUR. The Canadian agreement with Chile covers most agricultural products, but it exempts the Canadian dairy and poultry sectors and allows Chile to maintain its system of price bands (variable tariffs) for wheat, flour, vegetable oils, and sugar.

Mexico has been aggressive in pursuing regional and bilateral agreements throughout the hemisphere. In addition to its NAFTA membership, Mexico belongs to the Group of Three along with Colombia and Venezuela, and has agreements with Chile and MERCOSUR.

analysis is needed to clarify the issue. Empirical analysis of the implications of an FTAA for U.S. agriculture—with U.S. participation and without—is provided using a model developed by ERS. This global computable general equilibrium

model was used to isolate the effects of an FTAA from the other policy changes that are taking place in the hemisphere.

A "base" scenario was developed to represent a stylized view of agricultural production and trade in the Americas and with the rest of the world under full implementation of existing policies. Specifically, NAFTA, MERCOSUR

World Agriculture & Trade

U.S. Agricultural Trade Would Gain with FTAA Membership

Effect on U.S. exports

Effect on U.S. imports

Differences from base scenario as result of formation of an FTAA, with and without U.S. membership. Base scenario: Total U.S. agricultural exports $59.3 billion; total U.S. agricultural iimports $28.8 billion.

Economic Research Service, USDA

Under the second FTAA scenario, the hemisphere-wide agreement eliminates most trade barriers among all the Americas, *including* the U.S. The ERS analysis measured how U.S. agricultural trade under each of the two FTAA scenarios would differ from the base scenario. It is important to note that the scenarios discussed here are *simulations* of what would occur under specific policy assumptions. They do not represent observed data for any specific year. A Free Trade Area of the Americas that *includes* the U.S. (FTAA+U.S.) would result in about $580 million (real value) in additional exports for U.S. agriculture compared with the base scenario—a difference of 1 percent —and $830 million more agricultural imports for U.S. consumers—3 percent.

The net increase in U.S. agricultural imports does not imply that U.S. agriculture would be hurt by the agreement. Actually, because freer trade promotes more efficient use of productive resources in the economy, U.S. agricultural income would be slightly higher under the FTAA compared with the base ($180 million or less than 0.1 percent).

In the FTAA+U.S. scenario, U.S. agricultural exports to Central America, the Caribbean, and the Andean countries are 30 percent higher than the base scenario, and show the greatest gains in terms of value. U.S. exports to MERCOSUR are 50 percent higher. U.S. exports to NAFTA would be slightly lower (less than 1 percent), as U.S. exporters gain more favorable access to other markets in the hemisphere.

U.S. imports from MERCOSUR would be 30 percent greater in the FTAA+U.S. scenario, and purchases from Central America, the Caribbean, and Andean countries would be 6 percent above the base scenario. Imports from NAFTA and the regions outside the hemisphere would be slightly lower.

On the other hand, an FTAA that *excludes* the U.S. (FTAA-U.S.) could cost the agricultural sector about $130 million per year in lost exports (2 percent). Farm income shrinks by $50 million, or less than 1 percent compared with the base.

(including Chile), and the Uruguay Round agreement of the General Agreement on Tariffs and Trade are fully implemented in the base scenario. The model takes into account economic activity in both the agricultural and nonagricultural sectors.

Building on the base scenario, ERS then constructed two different scenarios under a hemispheric free trade agreement. Under the first, all countries in the Western Hemisphere *except* the U.S. eliminate most trade barriers among themselves, while trade policies between each of those countries and the U.S. remain unchanged. The U.S. remains a member of NAFTA, but the NAFTA partners also join the FTAA.

About the ERS Model

The model used in this analysis was developed by ERS and the University of Minnesota. The data used in this global computable general equilibrium model come from the Global Trade Analysis Project (GTAP), version 3. The model is static, and is global in the sense that all regions of the world are covered, and production and consumption decisions in each region are consistent with economic theory.

Trade flows among regions are multilateral in the model, and world prices are determined by world market-clearing conditions—in other words, demand for each commodity in the world has to equal its supply. Values are in real terms (1992 dollars). The general equilibrium feature of the model means that resources can move among sectors—for example, land can be switched between crops, and labor can move between agricultural and nonagricultural sectors.

The country/regional aggregations in the model include: the U.S., Canada, Mexico, Argentina, Brazil, Chile, Other Western Hemisphere, EU-15, Asia, and Rest of World. The agricultural sector is represented by the following commodity aggregations: rice, wheat, other grains (corn, barley, sorghum), nongrain crops (oilseeds, fresh fruits and vegetables, unrefined sugar, and cotton), livestock, meats, dairy and dairy products, beverages and tobacco, and other processed food products. The rest of the economy is represented by an aggregate manufacturing sector (excluding food processing) and a services sector.

The estimated impacts of an FTAA depend critically on the initial levels of trade protection and the degree of trade liberalization assumed in the model. Trade restrictions for the countries and commodities in the model are represented as *ad valorem* tariffs. These initial tariffs are approximations, because some of the country and commodity categories in the model represent aggregations and because some nontariff barriers are not included in the data.

For each of the scenarios examined, the assumed degree of trade liberalization is simulated by reducing the initial tariffs. Because full trade liberalization does not necessarily imply the elimination of all trade barriers—sanitary and phytosanitary standards, for example—the initial level of protection in the model is not always reduced to zero even though the pure tariff component is assumed to be eliminated.

er, because the U.S. retains open access to these markets even after they join the FTAA. Some, but not all, of the losses in U.S. exports to the hemisphere would be offset by gains in Asia, Europe, and the rest of the world.

In addition to the reduction in U.S. agricultural exports, imports would be very slightly lower—by about $90 million or less than 1 percent—as tariff reductions in member countries bid products away from the U.S. market. Imports from NAFTA partners would decline the most as Canada and Mexico gain access to other markets in the hemisphere, but imports from Central America, the Caribbean, and the Andean countries would also be lower. U.S. imports from Asia and Europe would be greater than the base, filling part, but not all, of the gap.

Although the potential economic gains for U.S. agriculture are small, ERS analysis clearly shows that the sector would be better off by joining an FTAA than by remaining on the sidelines. Moreover, by improving the economic well-being of the trade partners, an FTAA could increase their demand for agricultural (and other) products. An FTAA could also simplify the complex system of regional and bilateral trade preferences emerging in the hemisphere and could ensure that U.S. exporters gain or retain access to regional markets on a comparable basis with other exporters' access. Further, an FTAA could help countries "lock in" the economic reforms they have already adopted, improving the long-term outlook for growth and stability in the hemisphere.

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Under the FTAA-U.S. scenario, U.S. exports to Central America, the Caribbean, and the Andean Group would be $180 million, or almost 7 percent below the base scenario. This occurs because other major exporters in the hemisphere gain preferential access to these markets while barriers against the U.S. remain intact. U.S. exports to the NAFTA partners are not harmed, howev-

For a more comprehensive analysis of a potential FTAA on the agricultural sector of the U.S. and other countries in the hemisphere, look for ***Free Trade in the Americas***, upcoming from ERS. The report will assess the effects of trade liberalization on economic growth in the hemisphere, and provide a more detailed analysis of the commodity-level impacts.

Jack Harrison

Long-Term Trends Mixed for Agricultural & Rural Employment

Most U.S. occupational groups and industries, especially services and retail trade, are expected to post job gains through 2006, according to recently released projections by the U.S. Bureau of Labor Statistics (BLS). Although BLS does not forecast employment trends by region, the projections provide indications of the job picture for rural areas.

A large share of rural workers are employed in industries that BLS expects to grow. But the industries with projected employment losses and the occupations projected to see slow growth—notably agriculture and manufacturing—employ a larger share of rural than urban workers. Employment in agriculture, mining, and manufacturing is expected to decline. Within the agricultural industry, production agriculture is expected to experience a substantial loss of jobs, while agricultural services—including landscaping and horticultural services—continue to add jobs.

BLS projects that 18.6 million jobs will be created from 1996 to 2006, bringing the total number of U.S. jobs to 151 million. Job growth can be projected both by industry group and by occupational group. Projections by *industry* indicate that nearly all of the expected new jobs will be in

service industries, with large growth projected in health services; business services, including personnel supply services (temporary help services); social services, including residential care and child care; and engineering, management, and related services.

Employment in the agricultural industry is expected to be stable—only a 1-percent decline in jobs is projected. However, production agriculture is expected to decline by 253,000 jobs (11 percent) by 2006. In contrast, agricultural services are expected to add 240,000 jobs (18 percent) by 2006. Despite employment losses, production agriculture is expected to maintain an annual increase in real output of 1.6 percent as a result of improvements in agricultural techniques.

This projected change in the composition of agricultural employment continues the trend seen since 1986. Between 1986 and 1996, employment in production agriculture declined by 6 percent (147,000 jobs), while agricultural services increased by

almost 60 percent (490,000 jobs). The net result—which also included a loss of 29,000 jobs in forestry, fishing, hunting, and trapping—was about a 10-percent increase in employment in the agricultural industry.

Projections also indicate that U.S. employment in all major *occupational groups* is expected to increase, although employment in agricultural occupations is expected to grow by only 1 percent. BLS projects that professional specialty occupations (which have high educational attainment requirements) and service occupations (characterized as having low skill requirements) will generate half of the total job growth. Among professional specialty occupations, the largest gains are expected for teachers, librarians, and counselors; for computer, mathematical, and operations research occupations; and for health assessment and treatment occupations. Employment in service occupations is expected to be mainly in food preparation and service, cleaning and building service, protective service, and personal service (such as hairdressers, home health aides, and childcare workers).

The agriculture, forestry, and fishing occupational group is expected to grow by 37,000 jobs. Although job losses are expected for farmworkers and for farm operators and managers—especially self-employed farmers—these losses will be more than matched by gains in gardening, nursery, and greenhouse/lawnservice occupations. The higher growth rates of other occupational groups, however, will mean that agriculture, forestry, and fishing occupations' share of total employment will decline to 2.5 percent in 2006—down from 2.9 percent in 1996 and 3.3 percent in 1986, making this occupational group the smallest in the economy.

Rural Positioning for Job Growth & Shifts

A large share of rural workers are employed in industries and occupations expected to grow by 2006. Among the projected growth industries, rural areas

More details on BLS employment growth projections are available on the Internet at http://stats.bls.gov/emphome.htm, or in the November 1997 issue of BLS's *Monthly Labor Review.*

have about the same proportion of employment as do urban areas, except for the services industry—in 1995 (the most current data available), only 23 percent of rural jobs were in services, compared with 32 percent of urban jobs.

At the same time, however, rural areas have a larger share of workers employed in the sectors and occupational groups with projected slow or even negative growth, suggesting that rural economies are disadvantaged in their positioning for expected workforce changes during the next decade. In the manufacturing sector, for example, an important employer in rural areas (17 percent of total rural employment), productivity growth and strong demand for manufactured products are expected to support 2.4-percent annual growth in real manufacturing output. But these very productivity gains are expected to contribute to the loss of 350,000 manufacturing jobs nationwide.

Rural areas also have a larger share of workers in the occupational groups expected to have the least employment growth—agriculture, forestry, fishing, and related occupations; precision production, craft, and repair occupations; and operators, fabricators, and laborers. The only slow-growing occupational category that currently has a larger share of urban than rural workers is administrative support, including clerical, occupations. Average growth is expected to be fastest in occupations requiring at least an associate degree, and rural workers are less likely than urban workers to have such post-secondary education.

The five occupations expected to generate the most new jobs by 2006 are cashiers, systems analysts, general managers and top executives, registered nurses, and retail salespersons. These five occupations account for about 6 percent of rural employment, versus an urban share of 8 percent. The five occupations expected to lose the most jobs are sewing machine operators—garments; farmers; bookkeeping, accounting, and auditing clerks; typists and word processors; and secretaries—except for legal and medical secretaries. About 6 percent of rural workers are in these jobs, versus 5 percent of urban workers.

Classifying by Industry & Occupation

The Bureau of Labor Statistics classifies jobs in two ways. An industry classification identifies the sector that employs a worker, while occupation designates a type of job. For example, the agricultural industry includes crop production; livestock production; agricultural services (e.g., crop services, veterinary services, farm labor and management, and landscaping); forestry; and fishing, hunting, and trapping. Agricultural occupations include animal breeding and training; animal care; veterinary assistance; farm work; farm operation and management; farming and forestry supervision; forestry and logging; gardening, nursery, and greenhouse/lawnservice; gardening and groundskeeping; and fishing, hunting, and trapping.

For any given job, the industry designation does not necessarily coincide with the occupation classification. A worker in an agricultural occupation may actually work outside the agricultural industry, while a worker in a nonagricultural occupation may work in the agricultural industry. For example, an accountant—an occupation classified as executive, administrative, and managerial—who works for a farm operation would be classified in the agricultural industry. Along the same lines, a farmworker—an agricultural occupation—employed on a farm is in the agricultural industry, while a groundskeeper—also an agricultural occupation—employed by an automaker is classified as part of the manufacturing industry.

Employment To Shrink by 2006 in Agricultural Industry, but To Grow Slowly in Agricultural Occupations

| | Share of total employment* | | National growth/decline | |
	Rural	Urban	1986-96	1996-2006**
	Percent			
Industry				
Agriculture***	9	2	10	-1
Mining	1	1	-26	-23
Manufacturing	17	12	-3	-2
Services	23	32	50	33
Construction	6	5	12	9
Transportation, communications, utilities	4	5	19	14
Wholesale trade	3	5	13	12
Retail trade	17	17	21	10
Finance, insurance, and real estate	5	8	10	11
Government	15	13	16	9
Total Employment	100	100	19	14
Occupation				
Agricultural, forestry, fishing, and related	7	2	3	1
Precision production, craft, and repair	13	10	4	7
Operators, fabricators, and laborers	20	13	10	8
Service	14	13	22	18
Executive, administrative, and managerial	10	15	28	17
Professional specialty	11	16	34	27
Technicians and related support	3	3	24	20
Marketing and sales	10	13	27	16
Administrative support, including clerical	12	15	15	8
Total employment	100	100	19	14

*Rural/urban shares of employment based on 1995 data for industry, 1996 data for occupation. **Projected; assumes GDP annual growth of 2.1 percent. ***Includes farm, agricultural service, forestry, and fishing industries.
Sources: Bureau of Economic Analysis, U.S. Department of Commerce; Bureau of Labor Statistics, U.S. Department of Labor.

Economic Research Service, USDA

Farm & Rural Communities

What's Behind the Employment Growth Projections?

Prospects for U.S. employment by industry and by occupation depend primarily on major economic developments. BLS projections are based on a group of assumptions about the U.S. macroeconomy that can be characterized as slightly more conservative than the October Blue Chip consensus long-range projections, the most commonly cited report of the consensus of macroeconomic forecasters. BLS expects that real gross domestic product (GDP) will increase 2.1 percent annually from 1996 to 2006, slightly less than the 2.3-percent growth rate in 1986-96.

Much of the expected slowdown in GDP growth is due to a slower-growing labor force. Over the next decade, the population distribution will shift to age groups with lower labor force participation, such as the youth labor force (age 16-24) and the labor force age 55 and older. The aging of the baby boom generation is expected to increase the median age of the labor force to 40.6 years old, the highest since 1962.

BLS expects that the foreign trade sector will be the fastest growing component of real GDP and that exports will grow faster than imports, resulting in an improved trade position. (Note, however, that the projections were done before the Asian financial crisis.) BLS assumptions include decreased Federal spending (both defense and nondefense), a balanced Federal budget by 2006, and a surplus in the combined Federal and State budgets, leading to a downward trend in long-term interest rates.

Gross private investment is expected to increase 3.3 percent annually, faster than GDP growth. Consequently, productivity is expected to grow 1.1 percent per year, an increase over the 0.9-percent annual growth rate seen in 1986-96. In turn, real per capita disposable income is expected to increase by 1.1 percent annually as well.

BLS projects that the Hispanic population will continue to grow faster than the Black population, and by 2006, the Hispanic labor force is expected to increase its share of the total civilian labor force from 10 percent to 12 percent, compared with a steady share of 11 percent for Black workers. Non-Hispanic White workers will make up 73 percent of the work force, down from 75 percent, while Asians and other groups are expected to be 5 percent of the total, up from 4 percent.

However, despite job losses, agriculture, mining, and manufacturing will still employ millions of workers. In addition to the 18.6 million new jobs expected to be created by 2006, BLS projects that 32 million jobs will become open due to replacement needs, which will be in all occupational groups and at all levels of training and education.

Rural areas have done well so far in the 1990's—rural economies weathered the recession of 1990-91 better than urban economies, and rural areas continue to show solid economic performance by several measures, although employment growth has softened in the last 2 years. Rural areas experienced a net inflow of 1.5 million people migrating from urban areas in 1990-96. Employment growth has been strong, unemployment has been low, and real earnings have increased.

Rural areas have also increased employment in manufacturing during the 1990's, despite a nationwide decline in manufacturing jobs during the same period. The task now facing rural areas is to utilize their economic advantages, such as lower land and labor costs, in order to manage labor market changes over the next decade.

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Precision Agriculture: Information Technology for Improved Resource Use

A farmer walks through his soybean field in central Illinois, heading for a spot pinpointed by a remote sensing image the farmer downloaded in that morning's e-mail. Pest infestation in this small spot, indicated by a change in the "vegetative index," would not ordinarily be detected this quickly. Untreated, it could spread rapidly and destroy his entire crop. The farmer opens his palmtop computer, brings up information on the pest, completes an economic threshold analysis, and determines what control measures he will use. He records the exact location of the infestation using the integral global positioning system (GPS) receiver and alerts his pest control advisor and custom pesticide applicator via cellular phone link.

Meanwhile, a wheat farmer in Nebraska is recording yields as her combine passes through the field, pinpointing the location of each yield amount with the GPS receiver linked to the yield monitor. This and previous years' yield maps entered into a geographic information system (GIS) help her plan the fertilizer regime for this field to optimize economic yield and reduce nitrogen leaching to the groundwater.

These vignettes are not science fiction. Precision agriculture (PA), a new suite of information technologies, has the potential to improve resource use, increase profits, and reduce environmental impacts of agricultural production. While its promises are attractive, the performance of PA systems remains largely unproven. The National Research Council (NRC) recently convened an expert committee to assess precision agriculture and explore its implications for 21st-century farming, particularly for the public role in its adoption and development. This article highlights the committee's findings.

What Is Precision Agriculture?

As with any fledgling technology, precision agriculture has various definitions.

The NRC committee defines it as "...a management strategy that uses information technologies to bring data from multiple sources to bear on decisions associated with crop production." Fundamentally, precision agriculture acknowledges that conditions for agricultural production—as determined by soil resources, weather, and prior management—vary across space and over time. Given this inherent variability, management decisions should be specific to time and place rather than rigidly scheduled and uniform.

Precision agriculture provides tools for tailoring production inputs to specific plots within a field, thus potentially reducing input costs, increasing yields, and reducing environmental impacts by better matching inputs applied to crop needs. Information technologies used in precision agriculture cover three aspects of production: data collection or information input, analysis or processing of the precision information, and recommendations or application of the information.

Data collection occurs both before and during crop production, and is enhanced by collecting precise location coordinates using the GPS. Data collection technologies operating in advance of crop production include grid soil sampling, yield monitoring, remote sensing, and crop scouting.

Other data collection takes place during production through "local" sensing instruments mounted directly on farm machinery. For example, soil probes mounted on the front of fertilizer spreaders can continuously monitor electrical conductivity, soil moisture, and other variables to predict soil nutrient concentrations and to instantaneously adjust fertilizer application at the rear of the spreader. Optical scanners detect soil organic matter, or "recognize" weeds, to instantaneously

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Glossary of Precision Agriculture

Artificial intelligence (AI) systems. Predict outcomes or recommend actions based on computer-based learning that incorporates experience through developing heuristic rules, rather than through encoding theoretical relationships between variables from disciplinary science.

Crop scouting. Periodic ground-level inspection of the crop for weed, insect, disease, and moisture stress problems. Scouting often involves use of pheromone or other insect traps to estimate pest levels as part of integrated pest management (IPM) approaches.

Expert systems. Often considered a branch of AI, expert system models are differentiated from other AI approaches because the rules governing decisions are input by human experts, rather than deduced experientially by the system. In PA, expert systems would include rules for when to spray for specific pests, when to till, etc., modified by the past, current, and expected conditions represented by soil, weather, pest level, and other data input from the GIS.

Geographic information systems (GIS). Computerized map and database program that contains spatial (map) and attribute (characteristic) data linked by a common geographic identifier. GIS software provides for overlays and geographic analyses of multiple mapped layers, representing the spatial patterns of soils, crop yields, input applications, drainage patterns, and other variables of interest in a PA system.

Global positioning system (GPS). Determining precise location (latitude and longitude) based on radio signals from 4 or more of the 24 satellites in the GPS launched and maintained by the U.S. Department of Defense (DOD). GPS location is generally accurate to within 100 meters, with 95 percent probability, because DOD purposefully degrades the signal timing to frustrate enemy use of more precise locational information, a process called "selective availability." Selective availability is scheduled to be lifted within the next decade.

Grid soil sampling. Collection of soil samples based on a systematic grid laid out across a farmed field. Soil samples are analyzed in a laboratory to determine soil characteristics such as texture, organic matter, pH, and concentrations of nitrogen, phosphorous, potassium, or other nutrients.

Local sensing. A generic term for sensors mounted on farm machinery or equipment to detect soil conditions, nutrient concentrations, weed density and location, soil moisture, livestock identity, and other conditions for real-time input to variable-rate applications.

Process models. Detailed simulations of crop, livestock, or tree growth based on agronomic, physiologic, or hydrogeologic theory and implemented at short (daily, hourly) time steps.

Remote sensing. Data on light reflectance—collected by instruments carried in airplanes or orbiting satellites—that can be used to estimate the spatial pattern and vigor of vegetation at small areas within the field. Satellite remote sensing, such as the LANDSAT thematic mapper and SPOT satellites, can collect data with a spatial resolution of 10-30 meters, while airborne sensors and the next generation of satellites can achieve spatial resolutions of 1-5 meters.

Yield monitoring. Automated measurement of the amount of production taken at intervals as the combine or harvester passes over a field. To date, reliable yield monitors have been developed for corn, soybeans, and wheat, and are being developed for potatoes and sugarbeets. Data from the yield monitor must be integrated with data on vehicle speed, head position, and crop moisture level derived from separate sensors. These data are combined in onboard computers to produce an estimate of harvested yield for each area of the field that can be incorporated into a GIS database for the field.

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alter the amount or application of herbicides applied.

Precise data are useless unless they can be *analyzed or processed* to enable management adjustments. Geographic information systems (GIS) are the principal technology used to integrate spatial data coming from various sources in a computer. This is primarily an intermediate step, because data collected at different times on the basis of different sampling regimes and different scales must be combined for use with subsequent decision technologies, such as process models, artificial intelligence systems, and expert systems.

Computer process models use frequent time-steps to simulate the processes of crop growth, or the generation and movement of nutrients and pesticides through the environment. Artificial intelligence systems use heuristic or empirical decision rules, rather than the theoretically based relationships in most process models, to recommend appropriate management choices. Expert systems incorporate the "rules of thumb" used by human experts that match the conditions reflected in the input data in order to reach recommendations.

This is not "push button" farming. The alternatives and recommendations of these decision technologies are subject to the expert judgment of agronomists, crop consultants, and the producer. Precision

agriculture applications may depend on these immediate technologies, or may simply pass "raw" data directly from the GIS to the human decisionmakers.

The point of collecting and processing precise data is to manage each part of the field appropriately. Ideally, recommendations and applications of production inputs for each plant could be adjusted to optimize output according to the producer's agronomic, economic, and environmental goals. In practice, technology limits how small an area can be addressed and how finely inputs can be calibrated. Variable-rate technology (VRT) application generally describes precise control of inputs, which can include fertilizer and micronutrient application, liming, seed

variety and rate, pesticides, irrigation water, and drainage.

Communications links cut across all three stages of the precision farming process, contributing to data collection, analysis, and application. Fiber optic and satellite communication links, local area networks (LAN's), and the like link producers, cooperatives, Extension experts, processors, input dealers, consultants, and others involved in the production process. These communications links enable a nearly continuous electronic "conversation" or virtual community that puts many heads to work on interpreting precision information for better production decisionmaking.

Not Yet Widely Adopted

Precision agriculture has not been widely adopted to date. Because it is a suite of technologies that can be adopted piecemeal and combined in various ways, estimating the current level of adoption is difficult. Only a small percentage of farmers actively seek out new technologies and apply them.

Adoption of precision agriculture for subfield management is a refinement of good whole-field management practices. USDA's Cropping Practices Survey data for 1994 show that only a third of acres planted to major field crops (corn, wheat, soybeans, cotton, and potatoes) was soil-tested for nutrients. Pest scouting was done on slightly more than half of planted acres. Given the relatively low adoption of whole-field practices, the rapid adoption of subfield management technologies is not likely.

Precision agriculture is driven by computers, but a USDA survey shows that only 31 percent of the 2 million U.S. farmers and ranchers had computers in 1997, and only 13 percent had Internet access. A 1996 Purdue University survey of 1,500 ag chemical dealers found that only about a quarter of dealers had 10 percent or more of their customers using field mapping or other PA practices. A quarter of dealers surveyed expected that over 30 percent of their customers would be using field mapping, yield monitors, and other precision ag techniques within 2 years.

Combine-mounted crop yield monitors are one of the most popular ways for producers to get into precision agriculture,

The Suite of Precision Agriculture Technologies		
Production aspect	**Technology**	
Data collection/input	Global positioning system (GPS)	
	In advance of production: Grid soil sampling, yield monitoring, remote sensing, crop scouting	*During production*: Local sensing of: nutrients, pH, weeds
Analysis/processing	Geographic information systems (GIS), process models, artificial intelligence systems, expert systems, human decisionmakers	
Recommendation/ application	*Variable-rate application:* Fertilizer, micronutrients, lime, herbicides, insecticides, seeds, seed variety, drip irrigation	*Selective harvest:* Harvest timing

with industry sources reporting about 17,000 in use in North America in 1997, up from 50 in 1992. Commercially available yield monitors are currently available only for corn, soybeans, and wheat, and are being developed for bulky crops like potatoes, sugarbeets, and peanuts.

Co-ops and other input dealers are key drivers in precision agriculture adoption. The Purdue University survey also found that by 1998, 30 percent of the respondents expected to offer grid soil sampling with GPS, 35 percent expected to offer field mapping, and 29 percent expected to offer controller-driven variable-rate application. There are important regional and size differences in expected dealer adoption of PA services: 45 percent of Midwest dealers and 54 percent of co-ops and large independent dealers expected to offer field mapping by 1998 versus 17 percent in other regions and 34 percent of small independent dealers.

There has been some concern that there is a scale bias to precision agriculture, with larger farms more able to adopt and reaping more potential gains. PA technologies can give operators of large farms the same explicit detailed knowledge of their land that operators of small farms have had implicitly. However, the size of the investment required for precision agriculture (about $7,000 for a yield monitor and GPS receiver, plus $3-$7 per acre for grid soil testing) is not prohibitive for smaller operations.

The most expensive component of precision agriculture, variable-rate fertilizer application, is offered on a custom basis by fertilizer dealers, with the cost often embedded in fertilizer material prices. Although many larger farms have been PA innovators, the advantage may be one of technological sophistication rather than deep capital resources.

Implications for Profits & for the Environment

At this stage in the emergence of precision agriculture, neither the economic nor environmental advantages of subfield management have been definitively demonstrated. Any assessment of precision agriculture has several serious conceptual problems to overcome. Information technologies often contribute in indirect ways to the farmer's better understanding of his cropping system and changes to it. Some of those changes, such as reductions in total use of chemical fertilizers, are easily observed. Other changes are more subtle but will be expressed in higher productivity and lower runoff that, given the year-to-year variation in results due to a multitude of factors, may be impossible to isolate.

Because precision agriculture is a suite of technological tools that can be adopted piecemeal or in varying combinations, there are unlikely to be uniform answers regarding performance for all the possible permutations. Precision agriculture adjusts

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management decisions to suit variations in resource conditions. Because these conditions vary so widely from farm to farm and region to region, generalizations about performance across all situations are unlikely to be true.

Current costs for precision agriculture are estimated at $9-$23 per acre; future costs are likely to drop. Much less is known about the labor and time needed to integrate the systems and keep them running, or what true custom rates would be if "unbundled" from services provided by farm chemical and input dealers. Most of the costs likely to be borne by the farmer are to acquire information about the soils, yields, and pest problems occurring over the field. Chemical dealers are making major investments in PA equipment, particularly VRT applicators, because they can purchase larger, more economical equipment and can spread the costs over many farmers' fields, reducing the cost per acre.

Most of the scant literature on the profitability of precision agriculture focuses on variable-rate fertilizer application. A review of 15 studies showed that precision methods were not profitable in 5 studies, profitable in 5, and showed mixed results in 3 (2 studies were inconclusive).

The studies showed little uniformity in the period over which investments are amortized, the discount rate, which PA components farmers invest in and which are acquired through consultants or dealers at custom rates, the grid size for soil sampling, and the nutrients that are managed on a precision basis. The duration of studies varied as well, with empirical studies at most 3 years, and simulation studies varying from 1 to 24 years. There is likely as much temporal variation in PA profitability as there is across resource situations, so the longer the study, the more reliable the results.

Cost reduction is only part of the promise of precision agriculture. Analysis by USDA's Economic Research Service shows that a 10-percent reduction in nutrient and pesticide applications for major field crops would reduce costs only $2.14 to $23.97 per acre, while a 10-percent increase in yields would produce gains of $11 to $162 per acre. Thus, any increases in crop yields from preci-

sion management are likely to be as much or more of a basis for adoption than are cost reductions.

Much of the enthusiasm off the farm for precision agriculture can be attributed to the eminent good sense of matching input applications to plant needs. Precision agriculture is simply a more disaggregated version of the kinds of best management practices (BMP's) already recommended at the field level. But there is much more to learn about the impact of PA on water and air quality relative to conventional techniques.

Plot studies in Minnesota and Missouri showed reductions in nitrogen applied and in unrecovered nitrogen in the soil with variable-rate application, at little or no loss in crop yield. A study in Nebraska demonstrated reductions in pesticide applications from early detection, and reductions in herbicides from selective application to weeds.

Synergy between variable-rate application and biotechnology offers another way that precision can improve agriculture's environmental performance. Seed systems enhanced with natural insecticidal properties of *Bacillus thuringiensis* (Bt) can confer economic and environmental benefits when employed on a whole-field basis, but are likely to be more effective when applied on a precision basis.

For example, if there are yield penalties associated with some of these varieties, they may be planted only in areas of high weed infestation or where onboard sensors indicate higher organic matter (that could be associated with greater need for pre-emergence herbicide application). Precision application of Bt-enhanced seed could slow the development of resistance compared with whole-field application.

Public Roles in Precision Agriculture

One of the more important charges to the National Research Council committee studying precision agriculture was to assess appropriate public roles in the development of the technology. Each of the recommendations made by the committee implicitly envisions a role for public agencies.

Precision agriculture is based on satellite imagery, the GPS satellite network, and the Internet, all developed with massive public investments for defense and space objectives. Despite this initial large, but inadvertent, public role in technological infrastructure investments, the committee was generally convinced that private interests were well able and motivated to further the development and dissemination of precision agriculture. The committee regarded public roles in measurement technology, new approaches to research, unbiased evaluation, and training and education as filling critical ancillary or facilitative roles in an otherwise robust private development of the technologies.

Publicly funded research into the science underlying potential improvements in measurement methods is key, both in developing new sensors and manipulating and analyzing spatially referenced data. The committee also called for new approaches to basic agronomic research. PA methods for the first time open up the possibility of accounting for interactions between factors affecting crop growth in a way that cuts across scientific disciplines, using data generated by precision farmers themselves. The ever-finer spatial scales enabled by the technology make earlier generalizations from limited plot studies obsolete.

An area of concern for the committee is an objective evaluation of the pros and cons of PA technologies. Farmers are caught in a barrage of competing claims and hyperbole generated by developers and boosters of precision agriculture. Unbiased evaluations of the economic and environmental performance of precision cropping systems are needed to help farmers decide whether and when to adopt these new methods. The committee concluded that public leadership in collaborations among agencies, professional organizations, technology providers, and producers would provide the fullest and fairest basis for comparing methods.

The committee's other recommendations concern the movement, ownership, aggregation, and provision of data. In general, the capacity to move large quantities of digital data has been developed in proportion to population, with the highest "band width" for electronic data in urban areas.

Widespread adoption of precision agriculture will be accompanied by a many-fold expansion in the volume of electronic data moving among producers, suppliers, consultants, and customers in rural areas. Ensuring that adequate connectivity exists in rural areas is at least partly a public role.

The large volume of data generated by grid soil testing, satellite images, crop yield monitoring, and other precision technologies has to be shared among producers (who may or may not collect the data), consultants and input suppliers, Extension agents, university and USDA researchers, and commodity buyers. All of these may exercise some control or ownership over the data.

Issues of ownership and privacy are compounded as the data are combined with that from other entities, transformed, aggregated, interpreted, and analyzed. These kinds of intellectual property issues, while new to farming, are not unique. A public role is to search out existing law on such issues, reinterpret it for PA needs, and ensure that all parties agree to and exercise appropriate protections for data ownership and privacy.
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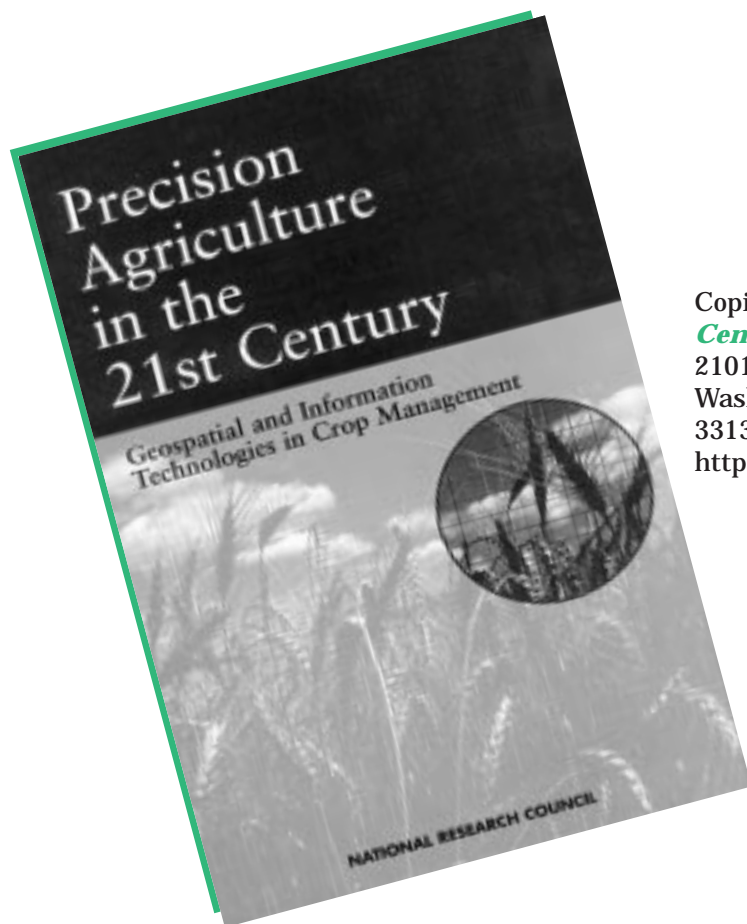
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Priscilla Glynn

Food Prices for 1998 Could Be Lowest Since Early '90's

Consumers are expected to pay between 2 and 3 percent more for food in 1998 than in 1997. If the increase is closer to 2 percent, it could be the smallest rise in the Consumer Price Index (CPI) for food since the early 1990's—1.2 percent in 1992 and 2.2 percent in 1993. Last year's retail food price increase was 2.6 percent.

Modest rises in the food CPI are projected to continue, according to USDA's 1998-2007 baseline, increasing at an average rate of about 2.5 percent through 2007. This compares with an average rise of 3.1 percent in the general inflation rate projected for this period.

What determines whether this year's rise will be closer to 2 or to 3 percent are a number of factors that are as yet uncertain. The first is whether the sluggish export market for beef, pork, and poultry continues throughout 1998. The second concerns the duration of the El Niño phenomenon and related turbulent weather in fresh vegetable growing areas of Florida, California, Arizona, Texas, and Mexico. With beef, pork, and poultry accounting for 19 percent of the food-at-home CPI, and fruits and vegetables an additional 15 percent, these unknowns could have a major effect on food prices in 1998.

Underpinning retail food price changes are general economic developments in recent years and the relationship between farm and marketing costs. Food price increases have been limited by the low general inflation rate, which is forecast to increase 2-3 percent in 1998. Increasing economies of size in the farm sector have also helped slow growth in food production costs, but the farm-value share of the retail price for most food items has continued to decline, expected at just 24-25 cents of the food dollar in 1997 and 1998. Retail prices are thus determined more by processing and marketing costs, which generally parallel the general inflation rate and which tend to rise more slowly than farm costs.

Also, a growing share of the food dollar has been spent on purchases of food prepared away from home—over 47 percent for the past 2 years, compared with 39 percent in 1968 and 45 percent in 1978. Away-from-home food prices, which contain a large service component, are being held down by competition among restaurants and fast-food establishments.

The food-at-home CPI increase of 2.5 percent in 1997 was moderated by lower grain prices, large supplies of competing meats (a result of lower grain prices),

adequate supplies of fresh fruits and vegetables, increased sugar production, and strong competition in the soft drink and prepared food industries. The 1997 price increase of 2.8 percent for food away from home was the largest since 1991 and was driven partly by tighter labor markets that have pushed up wages generally. However, continued strong competition among restaurants and fast-food establishments limited the pass-through of higher wage and raw materials costs to consumers. A limited pass-through is expected for early 1998, as labor and raw material costs have stabilized.

The revised CPI item structure implemented by the Bureau of Labor Statistics in December 1997 changes the relative importance, or weight, of some of the key food categories in terms of expenditure shares, which influences the all-food CPI. Meats, for example, which accounted for 12.2 percent of the all-food CPI under the previous structure, fell to 10.9 percent. Among the other major categories whose weights changed are fruits and vegetables—from 12.7 to 9.1 percent—and cereals and bakery products—from 9.2 to 10 percent.

The interplay of specific factors in the individual food CPI sectors helps explain the food price changes in 1997 and those expected in 1998.

Meats. Large meat supplies and reduced prospects for exports in 1998 are exerting downward pressure on U.S. livestock and poultry prices. The meat, poultry, and fish index, which increased 2.9 percent in 1997, is expected to drop as much as 2 percent in 1998. Large meat supplies, combined with currency devaluations in other countries and the need to find alternatives to sagging Asian markets, are making the U.S. a more attractive market for foreign exporters and challenging the U.S. in global markets. As a result, net exports of U.S. red meat are expected to shrink in 1998, adding to already abundant meat supplies competing for the U.S. consumer dollar.

- *Beef and veal.* After increasing a modest 1.7 percent in 1997, the CPI for beef and veal is expected to increase at about the same rate in 1998—between 0 and 2 percent—as large supplies of

competing meats and less-than-robust international trade hold down price increases at least until late summer. Commercial beef production in 1998 is expected to fall less than 1 percent from 1997 levels, although per capita beef supplies are expected to rise fairly sharply as the Asian financial crisis and the strong U.S. dollar lower beef exports and increase imports. U.S. beef exports are likely to decline about 2 percent in 1998, as reduced sales to the Pacific Rim offset any increased sales to Mexico.

- *Pork*. Forecasts of a 10-percent increase in pork production in 1998 should lead to the largest per capita consumption rate since 1994, increasing about 4 pounds from 1997 levels to almost 70 pounds per person. With expectations of plentiful supplies of pork and competing meats throughout 1998, pork retail prices are expected to fall 4-6 percent, following a 5.2-percent rise in 1997. U.S. pork exports in 1998 are expected to be 990 million pounds, off about 5 percent from 1997. Lower demand is expected in Asia, particularly in Japan, as a stronger U.S. dollar and lower priced Korean pork products erode U.S. market share.

- *Poultry*. Production of broiler meat in 1998 is expected to be almost 28.4 billion pounds, up 4 percent from 1997, while turkey production is expected to be down 1 percent following weak net returns in 1996 and 1997. During the past several months, export prospects for U.S. poultry have become less certain due to the continuing financial crisis in many Asian countries; currency depreciation against the U.S. dollar in Thailand and Brazil, which gives them a competitive price advantage over the U.S. in many major markets; and the outbreak of avian influenza in Hong Kong—and subsequent dampening of demand for all poultry products—which was the second-largest market for U.S. broilers and turkeys.

As these conditions continue into 1998, broiler production increases will likely slow down from initial brisk levels. The CPI for poultry is expected to be unchanged, after increasing 2.8 percent in 1997.

- *Other meats*. The price movements of these highly processed food items (hot

Items	Relative importance[1]		1996	Final 1997	Forecast 1998
	—Percent—		—Percent change—		
All items			3.0	2.3	2 to 3
All food	100.0		3.3	2.6	2 to 3
Food away from home	37.1		2.5	2.8	2 to 3
Food at home	62.9	100.0	3.7	2.5	1 to 3
Meats	10.9	17.3	3.5	3.0	-2 to 0
Beef and veal	4.8	7.7	-0.3	1.7	0 to 2
Pork	3.8	6.1	9.8	5.2	-6 to -4
Other meats	2.2	3.5	3.6	2.8	-1 to 1
Poultry	3.2	5.1	6.2	2.8	-1 to 1
Fish and seafood	2.2	3.5	0.9	2.3	1 to 3
Eggs	0.8	1.3	18.0	-1.5	-1 to 1
Dairy products	6.8	10.8	7.0	2.4	0 to 2
Fats and oils	1.9	3.0	2.4	0.9	1 to 3
Fruits and vegetables	9.1	14.5	3.5	2.0	2 to 4
Fresh fruits and vegetables	7.0	11.1	2.8	1.7	3 to 5
Fresh fruits	3.6	5.7	7.1	0.8	2 to 4
Fresh vegetables	3.4	5.4	-2.0	2.9	3 to 5
Processed fruits and vegetables	2.1	3.4	5.0	2.4	1 to 3
Processed fruits	NA	NA	5.8	2.5	0 to 2
Processed vegetables	NA	NA	4.0	2.3	1 to 3
Sugar and sweets	2.5	3.9	4.5	2.9	1 to 3
Cereals and bakery products	10.0	15.9	3.9	2.1	1 to 3
Nonalcoholic beverages	7.0	11.2	-2.4	3.7	1 to 3
Other foods	8.5	13.5	3.4	3.2	2 to 4

Changes in Food Price Indicators 1996 through 1998

[1]First column: Bureau of Labor Statistics estimated weights as share of all food, December 1997. Second column: weights as share of food at home, December 1997.

NA = Not available.

Sources: Historical data, Bureau of Labor Statistics; forecasts, Economic Research Service.

Economic Research Service, USDA

dogs, bologna, sausages) are influenced by the general inflation rate as well as the cost of the meat inputs. Retail prices of these products increased 2.8 percent in 1997, and are expected in 1998 to remain flat.

Fish and seafood. Almost 50 percent of fish and seafood consumed in the U.S. comes from imports. Imports for 1997 were up—salmon, shrimp, crawfish, mussels, tilapia, and oysters. Domestic production of catfish and trout was also up. In the 1990's, U.S. per capita seafood consumption has remained flat, between 14.8 and 15.2 pounds of edible meat per year, with population growth accounting for any increases in total domestic seafood consumption. The CPI for fish and seafood is expected up 1-3 percent in 1998, compared with 2.3 percent in 1997.

Eggs. Following volatile egg prices and a CPI increase of 18 percent in 1996, higher production and lower export levels during

1997 led to larger U.S. consumption of eggs and a drop of 1.5 percent in average retail prices. With table-egg production expected to increase further in 1998—by about 2 percent—consumption is expected to increase again, to the highest level since 1988. The CPI for eggs in 1998 is expected to be flat.

Dairy products. Higher milk production, along with modest dairy product demand, led to a 2.4-percent CPI increase in 1997. Production in 1997 rose about 1 percent from 1996 levels, with demand up and feed costs down. Increased output led to large U.S. commercial dairy stocks, particularly of nonfat dry milk and American cheese. With milk output expected to increase slightly this year, retail prices for dairy products are forecast to increase from 0 to 2 percent in 1998.

Fats and oils. Since fats and oils are highly processed food items, their prices are influenced by the general inflation rate as

Food & Marketing

well as by U.S. and world supplies of vegetable oils. The CPI for fats and oils is expected to increase a modest 1-3 percent in 1998, following a rise of just 0.9 percent in 1997.

Fruits and vegetables. Plentiful supplies of both domestic and imported fruits and vegetables limited retail price increases in 1997. But higher prices for potatoes, onions, and cabbage due to lower stocks and strong exports, along with delayed plantings, could result in periods of short supplies and elevated prices through spring 1998. (See "Briefs," page 6, for a discussion of this year's weather impacts on horticultural crops.)

- *Fresh fruits.* Total fruit-bearing acreage has increased steadily for the past 5 years. Citrus fruit acreage has expanded as replantings in Florida following the late-1980's freezes have begun to bear fruit. These trees, which include oranges and grapefruit, will produce increasingly larger crops into the early 2000's. California has also expanded its orange production area, with most of its crop going for fresh use; Florida's oranges are used mainly for juice.

Supplies of summer fruits were also abundant in 1997, bringing about generally lower increases in prices and expanded export opportunities. California, the largest U.S. producer of peaches, produced another bumper crop in 1997. Supplies of nectarines, plums, apricots, and sweet cherries were also abundant in 1997. Apple production was down about 2 percent in 1997, with a smaller Washington crop and smaller fruit size in North Carolina and Virginia. Supplies of bananas, which are virtually all imported, were ample during the past 2 years.

Despite heavier-then-normal rains in California and Florida this winter, citrus fruits were already developed by the time the stormy weather began, although the rains have hampered harvesting activities for this year's large orange crops. The 1998 peach crop in the southeastern U.S. could be significantly reduced as a result of 3 consecutive days of freezing temperatures in mid-March, although peaches are a small component of total fruit produc-

Growth in Food Prices To Remain Near General Inflation Rate

Percent increase
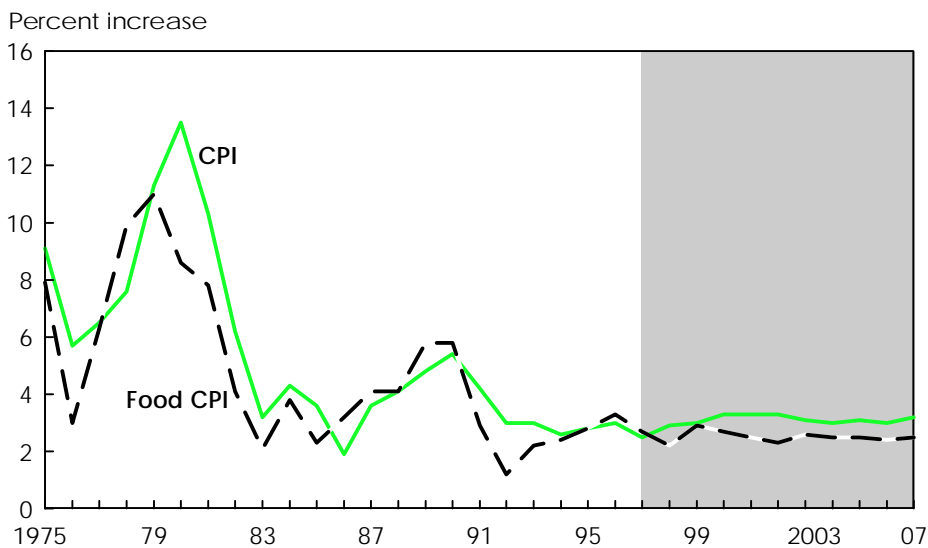
1998 forecast; 1999-2007 projected.
Sources: Bureau of Labor Statistics, U.S. Department of Labor; forecasts and projections, Economic Research Service

Economic Research Service, USDA

tion. The fresh fruit index, which increased a modest 0.8 percent in 1997, is expected to increase 2-4 percent in 1998, with strong U.S. demand expected to continue and exports projected to rise.

- *Fresh vegetables.* Growing conditions in the major fresh vegetable producing areas were mixed in 1997. A January freeze in Florida resulted in minimum damage to several fresh-market vegetables—squash, snap beans, green peppers, eggplant, and tomatoes—with the impact on retail prices for these items less than originally expected. Fresh-market vegetables grown in States not affected by the freeze are potatoes, lettuce, onions, celery, broccoli, cauliflower, and cabbage.

Growing conditions normalized during the spring and summer months, but the weather did an about-face in the last quarter of 1997. Torrential rains in Florida; rain and cold in the desert areas of California, Arizona, and Texas; and an unusual December freeze in west Mexico led to lower supplies and higher retail prices for tomatoes, bell peppers, lettuce, and broccoli.

In addition to the price effects of the weather-related problems, U.S. growers reduced harvested area from a year

earlier for some fresh-market vegetables and for potatoes (both processed and fresh), raising prices in fall 1997 from a year earlier. On an annual basis, fresh vegetable retail prices increased 2.9 percent in 1997. Prices in 1998 are expected to increase 3-5 percent. Prices in the first half of the year are likely to average about 10-15 percent higher than a year earlier due to periods of weather-related supply shortages in the wake of heavy rains in California. The magnitude of the annual increase depends on several factors: continuation of the unsettled weather patterns related to a strong El Niño through spring; 1998 plantings; and expected higher prices for potatoes, which account for the highest expenditure share of the vegetable CPI.

- *Processed fruits and vegetables.* Contract acreage for the five leading processing vegetables (tomatoes, sweet corn, snap beans, green peas, and cucumbers) was down 3 percent in 1997, after a 9-percent decline in planted acreage a year earlier. However, processed vegetable prices increased a modest 2.3 percent in 1997 and are expected to increase a modest 1-3 percent in 1998 because of plentiful supplies. Processing tomato supplies are expected up 10 percent, and

supplies of corn, beans, and peas are expected about the same as 1997. The ready availability of supplies also kept the CPI increase for processed fruits to 2.5 percent in 1997, with an expected increase of 0-2 percent in 1998.

Sugar and sweets. Domestic sugar production was down 2 percent to 7.2 million tons in 1996/97 but is projected up 9 percent in 1997/98; higher sugarbeet prices and lower prices for competing crops led to acreage increases in both years. Lower retail prices for selected sugar-related food items in 1997 held the sugar and sweets CPI to under 3 percent. Although U.S. sugar consumption has grown by about 1.9 percent per year since 1985/86 and industrial use of sugar has risen, the CPI increase is projected at a moderate 1-3 percent in 1998.

Cereals and bakery products account for a large portion of the at-home food CPI—almost 16 percent. While significantly higher grain prices contributed to higher retail prices for selected bakery products in 1996, grain prices came down in 1997. Moreover, most of the costs to produce cereal and bread products are for processing and marketing—more than 90 percent in most cases—making grain and other farm ingredients a generally minor cost consideration. Competition for market

share among the three leading breakfast cereal manufacturers led to a drop of 9.7 percent in the cereal component of the index from 1995 to 1996, with an additional decrease of 1.4 percent from 1996 to 1997. With competition among producers expected to continue, the CPI for cereals and bakery products is expected to rise by just 1-3 percent in 1998, following the 1997 increase of 2.1 percent.

Nonalcoholic beverages. Coffee and carbonated beverages are the two major components, accounting for 32 and 50 percent of the nonalcoholic beverages index. Lower coffee prices drove the index down by 2.4 percent in 1996, but the index moved up again in 1997—by 3.7 percent—reflecting a jump of 12.6 percent in coffee prices. Speculation about a smaller 1997/98 coffee crop in Brazil (the largest Arabica coffee producer), and an uncertain labor situation in Colombia, led to sharp increases in green coffee costs on the world market in spring and summer 1997. These price increases, combined with low U.S. coffee stocks, produced wholesale price fluctuations that translated into higher retail prices for 6 months of the year.

A 1.4-percent drop in carbonated beverage prices mitigated the increase in the

nonalcoholic beverages index in 1997. Competition in the soft drink industry between the two major competitors peaked during the summer months, continued through the end of the year, and led to the reduction in carbonated beverage prices. Moreover, prices of Robusta coffee beans, the primary ingredient in retail-store coffee blends, increased less sharply than prices for Arabica beans, which are used in gourmet coffees. Smaller increases in Robusta prices along with the drop in the carbonated beverages index checked what might have been a larger increase in the nonalcoholic beverages price index in 1997. With coffee prices continuing to decline since August 1997, the CPI for nonalcoholic beverages is expected to increase 1-3 percent in 1998.

Other foods. Other miscellaneous foods are highly processed and largely affected by changes in the all-items CPI. These products include frozen dinners, pizzas, and precooked frozen meats. Competition among these products and from the away-from-home market should continue to dampen retail price increases for items in this category. In 1997, the CPI for this category increased 3.2 percent and is expected to increase 2-4 percent in 1998.
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The information in *Agricultural Outlook* is available in advance

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Trade Prospects Support Bright Outlook
In USDA's Long-Term Baseline

Strong global trade prospects and a market-oriented domestic agricultural policy combine to produce a favorable outlook for U.S. agriculture over the next 10 years. In USDA's long-term baseline projections, assumptions of generally favorable global economic growth, combined with liberalized trade associated with both the GATT agreement and unilateral policy reforms, support strong growth in global trade and U.S. agricultural exports. While the baseline was completed before the full extent of the Asian crisis was evident, the long-term scenario represented in the projections would not be greatly altered if Asia recovers as expected over the next 3 to 4 years and resumes its long-term growth.

Greater market orientation in the domestic agricultural sector under the 1996 Farm Act puts U.S. farmers in a favorable position for competing in the global marketplace. Agricultural producers now respond to signals from the marketplace rather than to government commodity programs, making agricultural production economically more efficient.

With convergence of productive capacity and projected demand, nominal market prices rise, farm income increases, and the financial condition of the agricultural sector stabilizes. Management of risk will be important for farmers, reflecting the reduced role of government in the sector. The sector will be highly competitive, with successful producers having strong technical and managerial skills, and the trend toward fewer but larger farms will continue.

A combination of small increases in farm-level prices and moderate increases in marketing costs means that consumer food prices will continue to rise less than the general inflation rate. The largest price increases generally occur among the more highly processed foods, such as cereals and bakery products and other prepared foods, foods whose prices are related more to the costs of processing and marketing than to the costs of farm commodities. Expenditures for meals eaten away from home account for a growing share of food spending, reaching almost half of total food spending by 2007.

Macroeconomic assumptions used for the baseline provide a setting for strong growth in agricultural demand, both domestically and in international markets. Domestic macroeconomic assumptions include deficit reduction resulting in a balanced Federal budget, which leads to lower interest rates, rising investment, higher productivity, and stronger growth in gross domestic product (GDP) than in the last decade. Real GDP growth averages about 2.5 percent from 1998 to 2007, with consumer price inflation averaging about 3 percent.

Global economic growth averages over 3 percent annually in the next decade, well above growth during 1990-96. Macroeconomic
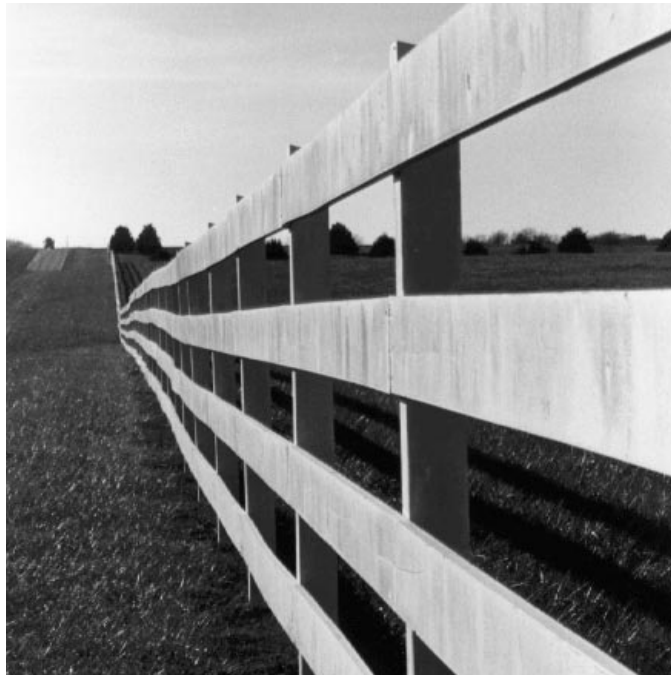
Jack Harrison

growth in developed countries averages about 2.5 percent through 2007 as low inflation and low interest rates lead to an improvement from the 2-percent growth in the first half of the 1990's. Aggregate growth for developing countries over the next 10 years is projected to average near 5.5 percent, compared to 5-percent growth in 1990-96. The developing Asian economies are expected to remain growth leaders in the longer term, despite 1997's currency devaluations and related economic slowdowns in Southeast Asia.

Importantly, the projected growth for many developing countries occurs at income levels that can promote increasingly diverse diets and increase demand for more meats and other high-value products. Income growth enhances demand for agricultural goods, both through increases in direct food use and through derived demand for livestock feeds to meet increases in meat demand.

Economic growth of the former Soviet Union (FSU) and countries in Eastern Europe improves over the next few years, following economic decline during the transition from centrally planned economies. Countries that are further along in the transformation to market economies and in integration into the global

The projections and discussion in this article draw from long-term projections published in the Departmental report, *USDA Agricultural Baseline Projections to 2007.* The projections were prepared in October-December 1997 and the report was released at USDA's annual Outlook Forum in February 1998.

economy (such as Poland) have higher projected growth earlier in the baseline.

Baseline projections incorporate provisions of the 1996 Farm Act and assume that the act is extended through the end of the baseline. The 1996 Act redesigned income support programs and discontinued supply management programs for major field crops. Production flexibility contract payments established by the act are generally unrelated to current plantings or to market prices. In aggregate, these payments decline from 1997 through 2002, when they expire. Expanded planting flexibility under the act permits producers to base cropping choices more fully on signals from the marketplace. The 1996 Farm Act also phases out price supports for dairy and requires the consolidation and reform of Federal milk marketing orders.

The baseline assumes that the Conservation Reserve Program (CRP) will increase to its maximum authorized level of 36.4 million acres by 2001. CRP enrollment involves a competitive selection process based on an environmental benefits index that takes government costs into consideration.

The baseline assumes full compliance with all bilateral and multilateral agreements affecting agriculture and agricultural trade. Projections assume full compliance with the internal support, market access, and export subsidy provisions of the General Agreement on Tariffs and Trade (GATT) Uruguay Round Agreement. The baseline assumes no accession to the World Trade Organization by the FSU, China, or Taiwan; no enlargement of the European Union (EU) beyond its current 15 members; no implementation of more liberalized trade among the countries of the Asia-Pacific Economic Cooperation; and no expansion of the North American Free Trade Agreement. Agricultural and trade policies in individual foreign countries are assumed to continue to evolve along their current paths.

Field Crop Prices Strengthen

Productive capacity for crops in the U.S. is projected to rise in the next decade as a result of increases in land use and productivity. Yields for most crops are projected to rise at or near their long-term trend levels. These gains reflect, in part, the acquisition of agricultural land by larger, generally more efficient farms, continuing a long-term trend. Nonetheless, gains in use outpace yield increases for corn, wheat, soybeans, and rice, so additional land is brought into production. Additional area is drawn into production

Field Crop Stocks-to-Use Ratios Continue To Decline
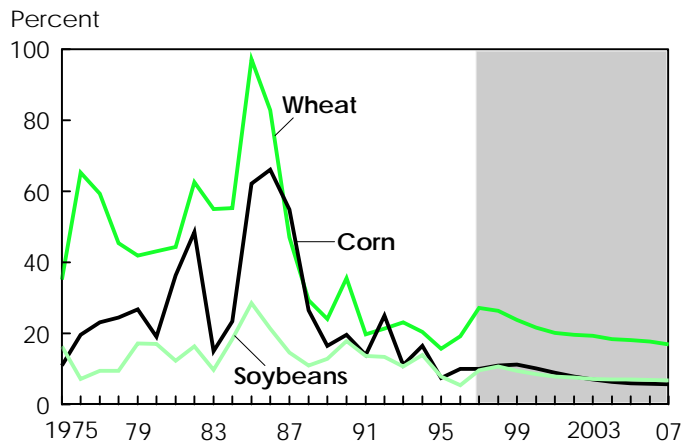
1998 forecast; 1999-2007 projected.
Economic Research Service, USDA

based on market incentives, since production flexibility contract payments are not dependent on current production decisions.

By 2007, planted acreage for major crops rises about 20 million acres above average plantings in the early 1990's. More than half of this increase in cropland use has already occurred. Increased planting flexibility under the 1996 Farm Act has facilitated these acreage increases and will continue to do so over the rest of the baseline period. Planting flexibility also allows farmers to adjust the mix of crops planted in response to changes in relative net market returns among the crops.

Export markets are the largest source of demand growth for most U.S. crops. Reduced trade barriers under the Uruguay Round agreement combined with strong global economic growth raise world agricultural trade and U.S. crop exports. U.S. exports of feed grains and wheat expand the fastest. Increasing coarse grain exports largely reflect stronger economic growth in developing regions, where higher incomes result in diet diversification and rising demand for meat. This leads to expanding foreign livestock sectors and demand for feed.

Increases in global wheat trade also reflect rising incomes in developing countries. However, U.S. wheat export growth slows somewhat after 2000 as global wheat prices rise high enough to permit unsubsidized competition from the EU. This allows the EU to export wheat beyond its GATT agreement quantity limits on subsidized wheat exports. Rising global import demand for soybeans and soybean meal reflects expansion of developing country feed-livestock sectors and increases U.S. soybean and meal exports during the baseline period. However, tightening domestic supplies and rising prices allow U.S. competitors from South America to capture a greater share of world soybean and meal trade. U.S. cotton exports maintain a 25- to 26-percent share of a growing global market.

Baseline Projects Increase in U.S. Planted Area for Most Field Crops, As Gains in Use Outstrip Yield Growth

	Average annual growth, 1991-95 to 2007		
Crop	Use	Yields	Planted area
	Percent		
Wheat	1.1	0.6	0.5
Corn	2.2	1.5	0.8
Soybeans	2.3	1.4	1.0
Rice	1.3	0.7	0.3
Cotton	1.2	1.2	0.0

Economic Research Service, USDA

Real U.S. Prices Decline Slightly for Crops . . .

$ per bu.

. . . and for Livestock

$ per cwt
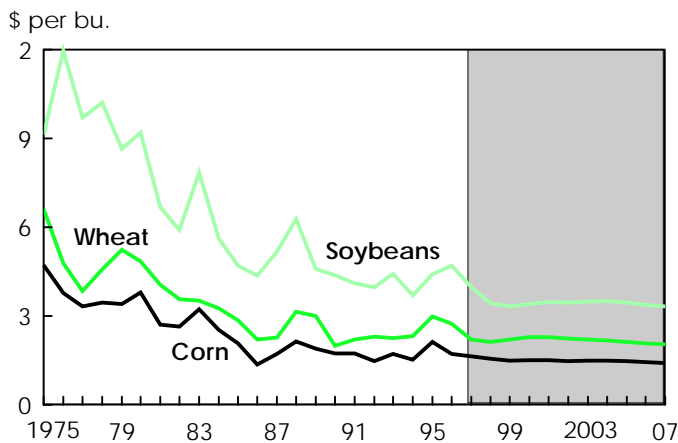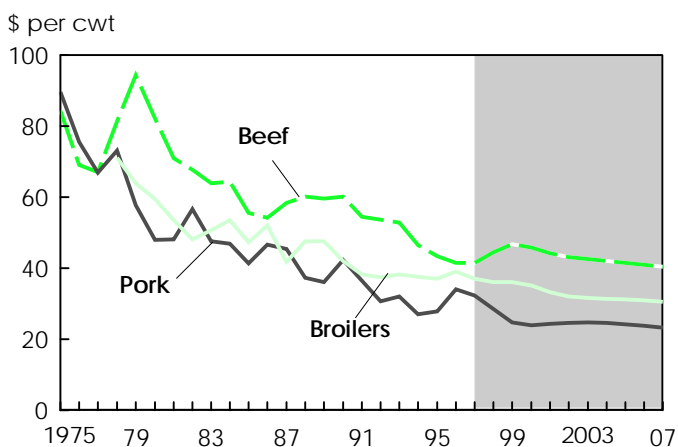
1998 forecast; 1999-2007 projected. Beef prices for Choice Steers, Nebraska; pork prices, Iowa, southern Minnesota market; broiler 12-city market price.

Economic Research Service, USDA

Domestic demand for most crops is projected to grow slightly faster than population. Notably stronger domestic demand for rice reflects increasing numbers of Americans of Asian and Latin American origin and a greater emphasis on dietary concerns. Gains in corn sweetener use and in corn used for ethanol production also exceed population growth rates. Increases in domestic soybean crush reflect continued strong growth in poultry production and demand for soybean meal. Domestic wheat use, however, is nearly flat as declining wheat feed use offsets food use gains. Greater U.S. exports of cotton yarn, fabric, and semifinished products will promote growth in domestic mill use of cotton, although increases in textile imports—mostly apparel—and competition from manmade fibers limit domestic gains.

Long-term trends in supply/demand balances for the major field crops imply tightening stocks-to-use ratios and strengthening nominal prices from 1999 to 2007. The historical downward trend in real (inflation-adjusted) crop prices is projected to slow.

Sugar production rises in the baseline, led by gains in beet sugar production, which accounts for a growing share of domestic sugar production. Per capita sugar use rises about 2.5 pounds per person over the next 10 years, with growth slowing from recent years due to continued substitution of other sweeteners such as high-fructose corn syrup.

Tobacco production generally declines in the baseline due to reduced domestic use and declining leaf exports. Domestic use falls as cigarette exports stabilize and domestic consumption continues its long-term decline due to higher taxes, increased regulation limiting smoking and sales, and heightened awareness of links between smoking and various diseases. Leaf exports decline due to the price and quality competitiveness of other producers.

The farm value of U.S. horticultural crop production (including greenhouse/nursery) increases over 3 percent annually through 2007. While there will be some gains in per capita consumption of fruits and vegetables domestically, an increasing share of horticultural production value will go to export markets, reflecting foreign income growth and trade liberalization.

Record Meat Supplies Projected

Record total meat supplies are projected through the baseline, including an increasing proportion of poultry. Per capita consumption of red meats declines, and toward the end of the baseline, per capita poultry consumption surpasses per capita red meat consumption on a retail-weight basis. Declining real prices for meats along with increasing real disposable income allow consumers to buy more total meat with a smaller proportion of disposable income. Per capita consumption of eggs rises in the baseline as greater use of eggs in processed foods offsets declining shell-egg use.

The livestock sector continues adjustments over the next few years following the high feed costs of 1995/96. As grain prices have fallen, pork and poultry production have rebounded. However, with tight forage supplies and longer biological production lags for cattle, beef production falls through 2000. For the remainder of the baseline period, lower feed prices than in 1995/96, replenishment of forage supplies, low inflation, and strong demand (domestic and export) result in returns to producers that encourage increases in red meat and poultry production.

Cattle herds rebuild from a cyclical low in 2000 (97 million head) to near 102 million head by 2007. Shifts toward a breeding herd of larger cattle and heavy slaughter weights partially offset the need for expanding cattle inventories to previous levels. The beef production mix continues to shift toward a larger proportion of fed beef. The U.S. remains the world's primary source of high-quality, fed beef.

Pork production becomes more vertically coordinated, with larger, more efficient operations. This structural shift results in a more inelastic industry supply curve, dampening hog sector cycles. The U.S. becomes an increasingly important net pork exporter, reflecting cost competitiveness of U.S. operations, as

Per Capita Broiler Consumption Overtakes Beef Consumption . . .

Lbs per capita

Boneless weight.
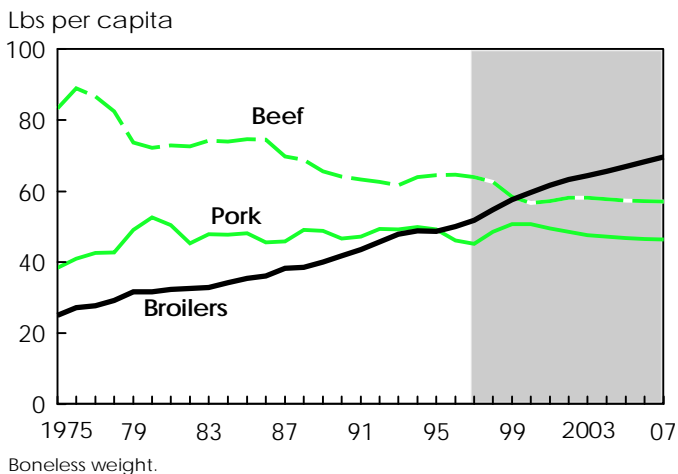
. . . and Broiler Production Rises
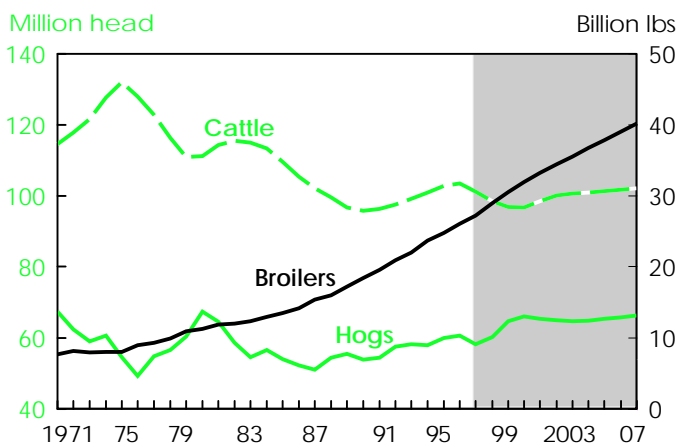
1998 forecast; 1999-2007 projected.
Economic Research Service, USDA

well as greater environmental constraints for some competitors that limit their production gains.

Technological advances and improved production management will continue to be important in the broiler and turkey industries, but will be unable to hold down production costs as significantly as in the past 10 years. Competition in global poultry markets holds U.S. poultry exports to moderate gains, although export gains are expected for broiler parts, especially for dark meat.

Dairy productivity gains offset declining cow numbers over the next 10 years, allowing milk production to grow. Real milk prices fall, pushing weaker operations out. However, milk production continues to expand in the West and on large dairy operations in the North. Expansion in commercial use of dairy products is led by sales of cheese and dairy ingredients for processed foods, while fluid milk sales remain flat.

Net Farm Income Rises, Boosting Farm Sector Net Worth

Net farm income rises gradually through the baseline period as strong agricultural demand leads to increased output and strengthening prices. However, gains are slightly less than inflation, so real net farm income is down through 2007. The agricultural sector relies increasingly on the marketplace for its income as direct government payments fall throughout the baseline and represent less than 3 percent of gross cash income beyond 2000. As provided for in the 1996 Farm Act, production flexibility contract payments decline from 1997 to 2002.

Both crop and livestock receipts are up in nominal terms due to larger production and higher prices. Production expenses increase in the baseline, with expenses for nonfarm-origin inputs—such as labor, fertilizer, and pesticides—rising faster than expenses for farm-origin inputs. Cash operating margins stabilize, with cash expenses representing about 75 percent of gross cash income.

Higher nominal farm incomes and relatively low interest rates assist in asset accumulation and debt management, leading to an improved balance sheet for the farm sector. Farm asset values increase throughout the baseline, led by gains in agricultural land values. Increases in farm debt rise less rapidly than in the past,

Milk Production Continues To Increase . . .
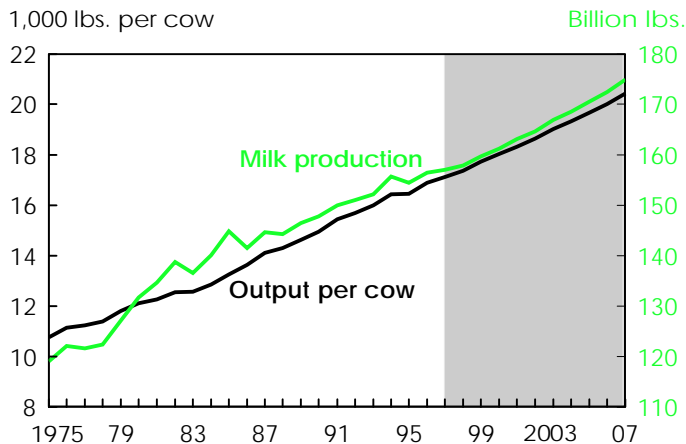
. . . While Herd Size Declines
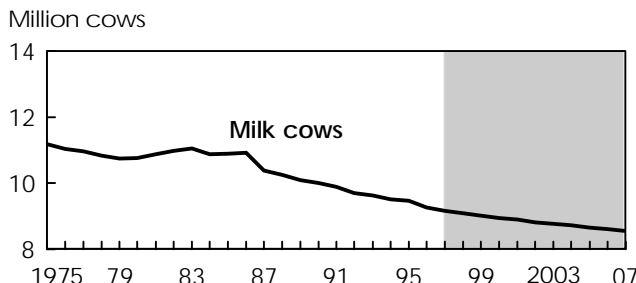
1998 forecast; 1999-2007 projected.
Economic Research Service, USDA

U.S. Farm Financial Outlook Is Favorable
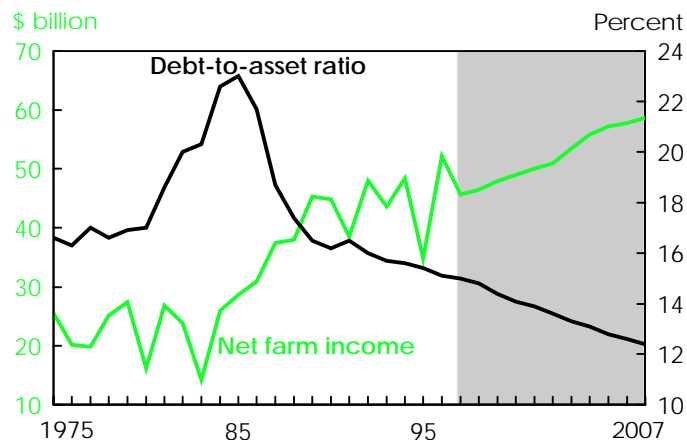
1998 forecast; 1999-2007 projected.
Economic Research Service, USDA

and debt-to-asset ratios continue to drop from over 20 percent in the mid-1980's to less than 13 percent by the end of the baseline.

With asset values increasing more than debt, farm equity rises significantly. Increasing nominal farm income in the baseline, combined with rising farm equity, means relative financial stability in the farm sector. The trend toward fewer but larger farms continues, as producers who are more efficient and better managers acquire the production resources of exiting farmers.

The 1996 Farm Act transferred risk of income variability from the government to farmers. Although baseline projections assume no shocks, normal variations in supply and demand will occur; net farm income is potentially more variable from year to year because production flexibility contract payments are fixed regardless of market prices. Total revenue will reflect market price variation more directly, where previously a portion of this risk was managed through deficiency payments linked to market prices.

Marketing alternatives to manage risk and buffer a portion of this potentially greater income volatility will become more important for many farmers. Some farmers will expand their use of futures and options markets, possibly using new instruments such as yield contracts. Many producers continue to use crop insurance for yield protection and may expand coverage using revenue insurance now available in some areas. Other alternatives to manage risk include diversification of production, contracting in advance for the future sale of the commodity, integrated ownership, and involvement with more value-added processing beyond the farm gate.

Trade Prospects Remain Bright, Led by High-Value Products

The USDA baseline projects strong growth in global trade of bulk and high-value agricultural commodities, together with strengthening bulk commodity prices. With U.S. agriculture facing relatively sluggish growth in domestic demand and becoming increasingly dependent on trade for growth, expanding global demand and prices support steady gains in farm output and market-based incomes.

The total value of U.S. agricultural exports rises steadily from $57.3 billion in fiscal 1997 to nearly $85 billion in 2007. U.S. agricultural import values also rise, but with exports increasing more, the net agricultural trade balance rises about $12 billion from $21.5 billion in 1997. High-value product (HVP) exports grow more rapidly than bulk commodity exports and are projected to account for about 63 percent of total U.S. agricultural exports by 2007. HVP export gains are led by exports of horticultural products and animal products. Although bulk exports are projected to grow more slowly than HVP exports, faster growth in most bulk exports compared with the 1980's is expected to be a key source of export strength during 2000-2007.

Several factors drive the favorable prospects for global farm trade. Key among these is the outlook for relatively strong economic growth across developing countries, including those in Latin America, North Africa, and the Middle East where economic performance was generally weak during much of the 1980's and early 1990's. The anticipated restoration of positive growth in the transition economies of Eastern Europe and the former Soviet Union is another key shift in the macroeconomic outlook. Compared with developed economies, consumer food demand in both the developing and transition economies should be highly responsive to improvements in income. Also fundamental to the

Baseline Design & Uses

USDA's longrun baseline provides projections for the agricultural sector through 2007. Projections cover agricultural commodities, agricultural trade, and aggregate indicators of the sector, such as farm income and food prices. The projections are a conditional longrun scenario with no shocks and are based on specific assumptions regarding the macroeconomy, agricultural policy, the weather, and international developments. The projections incorporate provisions of the Federal Agriculture Improvement and Reform Act of 1996 (1996 Farm Act) and assume that current agricultural law remains in effect through 2007.

The baseline projections are one representative scenario for the agricultural sector for the next decade. The projections are not intended to be a Departmental forecast of what the future will be. Instead, the baseline provides a description of what would be expected to happen under the 1996 Farm Act, with very specific external circumstances. Thus, the projections in the baseline are conditional on those assumptions.

Once the baseline is established, an important use of the projections is in analyzing alternative scenarios. The baseline provides a point of departure for discussion of alternative farm sector outcomes that could result under different assumptions, ranging from different macroeconomic assumptions to agricultural policy changes to weather shocks.

trade outlook are the increasingly market-oriented domestic and trade policy regimes across many developed and developing countries. These reforms—arising from multilateral, regional, and unilateral initiatives—should permit the impacts of expanding consumer demand to be transmitted into world markets.

As the 1996 Farm Act steadily increases the dependence of U.S. agriculture on market returns, the economic health of the sector will be increasingly linked to developments that affect global demand and U.S. competitiveness. Despite the solid fundamentals in the outlook, many uncertainties could alter projected gains in world trade and strengthening of world prices.

Rising Developing Country Incomes To Benefit Feed Grains . . .

Coarse grains are projected to show the fastest trade growth among bulk commodities, due to rising meat consumption and feed demand across developing regions. Trade in soybeans and meal, while projected to be slower than feed grains, will also be driven higher by expanding feed-livestock sectors in developing countries.

World import demand for coarse grains is projected to strengthen in the baseline, with annual growth averaging 3.4 percent through 2007. Global trade is projected to exceed in 2001 the 1980/81 record of 108 million tons and to reach over 132 million tons by 2007.

Stronger economic growth is expected to fuel higher coarse grain imports by China, Southeast Asia, North Africa, the Middle East, and Latin America. East Asian imports are projected to remain steady, as declining feed demand in Japan due to rising meat imports is roughly offset by moderate growth in feed demand in Korea and Taiwan. Taiwan's feed imports are expected to begin recovering by 2000, as hog numbers start to rebound from the 1997 foot-and-mouth disease (FMD) outbreak and as poultry production continues to expand.

Southeast Asian feedgrain imports are expected to be slowed by the effects of the financial crisis, but show strong longer term growth. The FSU, one of the world's largest importers during the 1980's, is expected to be a small net importer of coarse grains late in the baseline, as animal numbers increase with an improving economy.

Significant growth in both corn and barley trade is expected. The largest gains in corn imports are expected to occur in China, Southeast Asia, and North Africa and the Middle East, where demand for feed for livestock is expected to continue expanding rapidly. For barley, much of the demand growth will occur in China and other malting barley markets. Growth in feed barley trade is expected to be slowed by constrained supplies and substitution of other feeds. China's coarse grain demand, however, is central to the projected growth in global trade, and the recent drop in China's imports has created additional uncertainty.

Baseline Projects Strong Growth for U.S. Agricultural Exports . . .

$ billion
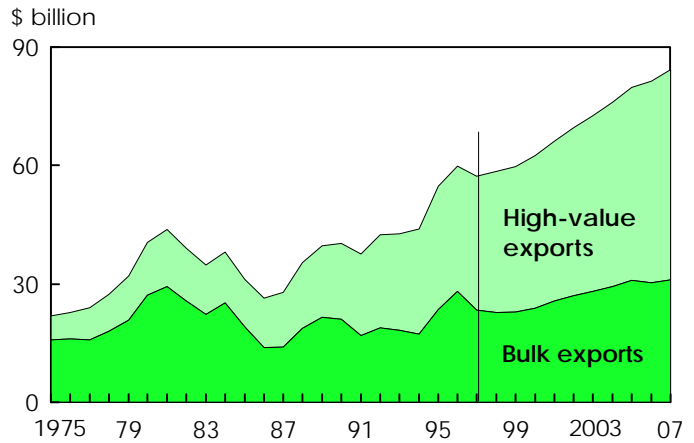
. . . and Global Economic Growth Is Key

Real GDP growth (%)

Annual average:
1987-1997
1997-2007
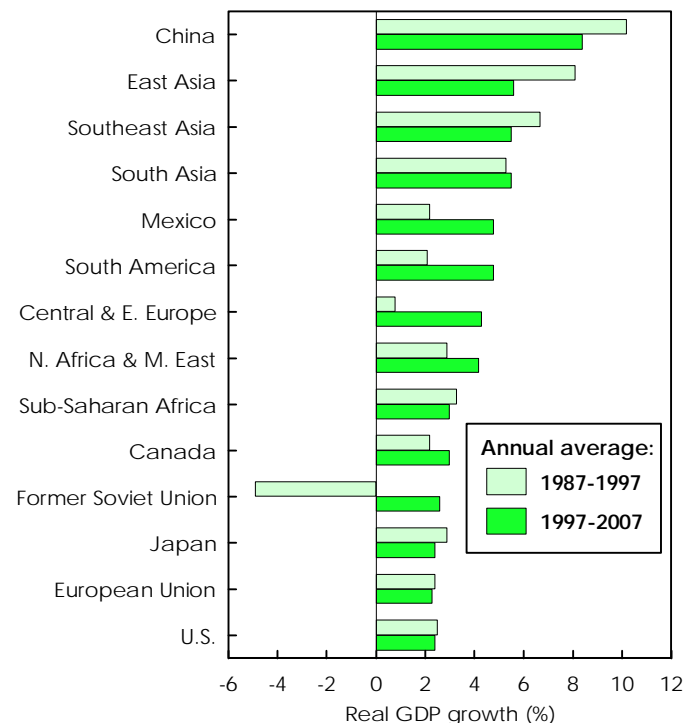
1998 forecast; 1999-2007 projected.
Economic Research Service, USDA

U.S. exports of coarse grains are projected to rise in the near term, as China returns to being a net corn importer and competition from Eastern Europe declines. The U.S. share of world coarse grain trade is projected to grow to more than 66 percent, but will decline somewhat near the end of the baseline as stronger prices boost foreign production and U.S. area expansion is increasingly limited by the CRP and crop competition. Although Argentina's corn exports are projected to rise, wheat and oilseed prices are likely to limit corn expansion in

Special Article

Argentina, leaving the U.S. the major beneficiary of robust import demand for corn.

Growth in world soybean and meal trade is projected to remain strong, although somewhat slower than during the last 10 years because of weak demand growth in the FSU, Japan, and the EU. Combined trade of soybeans and meal is projected to grow about 2.1 percent annually through 2007, with growth in soybean trade projected at 1.8 percent and meal trade at 2.3 percent. Developing economies account for virtually all of the projected soybean and soybean meal import growth. Import demand is projected to expand most rapidly in China. Economic difficulties slow Southeast Asian imports during 1998 and 1999, but growth is then expected to resume. Income growth also supports robust gains in livestock and feed protein demand in South America, the Middle East, and North Africa.

The U.S. soybean market share is projected to remain about 68 percent through 2007, while the U.S. share of the soybean meal market shrinks from 19 percent to 16 percent. U.S. market shares remain lower than achieved in the 1980's because limited potential for expanding U.S. area and rising domestic feed demand—partly driven by growing meat exports—constricts U.S. exportable supplies. Brazil's stronger internal feed demand is expected to slow its meal exports, but Argentine and Indian exports are projected to show solid long-term growth.

. . . As Well As Food Grains & Oils

Wheat trade is also expected to respond to stronger income growth and continued urbanization in developing regions. World wheat trade is projected to grow about 2.5 percent annually through 2007, significantly faster than in the previous 10 years. Most growth is expected to occur in lower- and middle-income countries across Asia, Latin America, North Africa, and the Middle East. China's wheat imports, a key source of uncertainty in the outlook, are projected to rebound from recent low levels, as domestic yields fall back to trend levels, area remains limited, and demand growth outstrips production. In nonproducing areas of Asia, income gains and urbanization will continue to shift consumer preferences away from rice and other traditional staples and toward wheat-based foods and meat. In North Africa and the Middle East, rising incomes and market-oriented farm reforms, including privatization of trade, are expected to boost imports.

U.S. wheat market share is projected to grow until 2000, then decline slowly when prices become high enough for the EU to export without subsidy. In the later years of the baseline, U.S.

exports are increasingly affected by slow yield growth, large acreage in the CRP, and increased competition from the EU and others. While EU exports are likely to be controlled by the Uruguay Round limits on subsidized exports during 1998-2000, the extent of EU competition after 2000 will depend on EU policies, particularly management of its land set-aside program. The baseline assumes a 10-percent set-aside to take advantage of export opportunities for wheat while minimizing risks of building excess stocks of barley. Initially, land constraints and competitive prices for other crops are expected to limit wheat exports by Argentina, Australia, and Canada, but competition by these and nontraditional exporters is expected to increase in response to strengthening prices later in the baseline.

Rice trade is projected to grow about 2 percent annually through 2007, with growth strengthening after 2000. Anticipated growth remains about the same as in the 1980's and the early 1990's. Long-grain varieties are expected to continue to dominate trade, despite anticipated gains in medium-grain (japonica) rice imports by Japan and South Korea under the Uruguay Round agreement. The U.S. rice export market share is expected to remain near the recent level of 13.5 percent through 2000, then decline to about 11 percent by 2007. Small U.S. production gains, strong domestic use, and high prices relative to competitors are expected to limit the volume of U.S. rice exports.

World vegetable oil trade is projected to grow 2.7 percent annually, less than the rates achieved in the 1980's and the early 1990's. Rising incomes and import demand in China, India, and Pakistan will be the main drivers of trade growth. Soybean oil trade is projected to slow more than total vegetable oil trade, with projected annual growth of 1.8 percent during 1997-2007. That compares with growth of about 9 percent in the early 1990's, when U.S. and EU subsidies contributed to sharp import gains in developing countries. During 1997-2007, growth in soybean oil trade will be curbed by reduced U.S. export subsidies, negligible oilseed expansion in the EU, and higher relative prices that shift demand toward competing oils, particularly palm oil. The U.S., Argentina, Brazil, and the EU continue to account for more than 90 percent of world soybean oil exports—Argentina remains the largest exporter.

World cotton trade is expected to grow 1.7 percent annually through 2007, reversing much of the decline suffered during the previous 10 years. The contraction of world cotton trade that began in the late 1980's stemmed from the sharp decline in Russian demand and the continued shift of the spinning process from traditional cotton-importing countries to cotton-producing countries.

During the baseline period, demand is expected to begin rebounding in Russia and Central and Eastern Europe, and consumption gains in Mexico, Brazil, and China are expected to outpace production and push up world trade. In addition, pest and disease problems are expected to constrain growth in Pakistan's raw cotton production and textile exports, strengthening raw cotton demand by some other textile exporters that rely on imported cotton. U.S. cotton exports are also expected to

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USDA Baseline Availability

USDA's 1998 baseline projections are available electronically on the Internet at: http://www.mannlib. cornell.edu/ data-sets/baseline/94005.

An ERS briefing room for agricultural baseline projections has also been set up at: http://www.econ.ag.gov/briefing/baseline/.

World Grain and Meat Imports to Rise

Coarse Grains

Million tons

Beef

Million tons

Soybeans and Meal

Million tons

Pork

Million tons

Wheat

Million tons

Poultry

Million tons
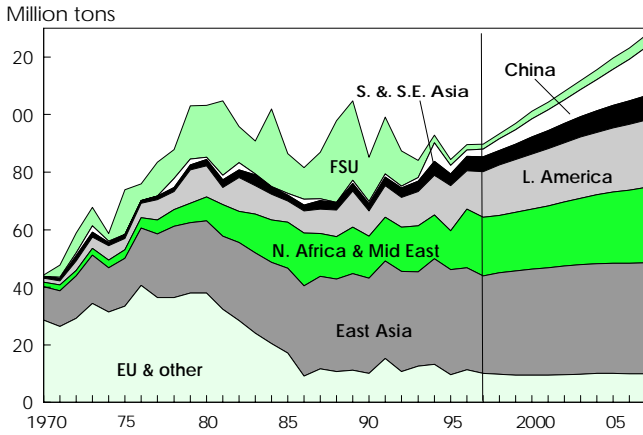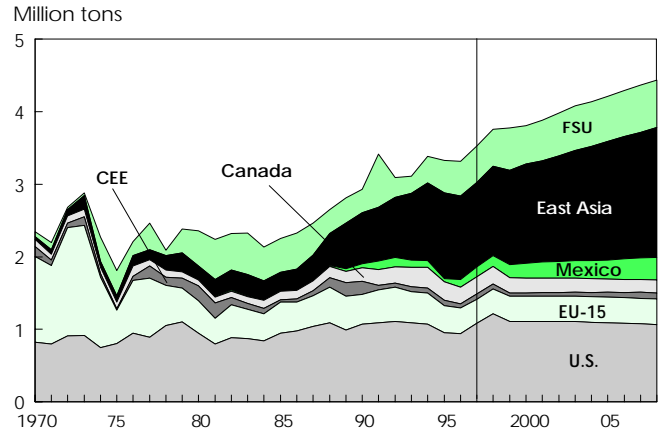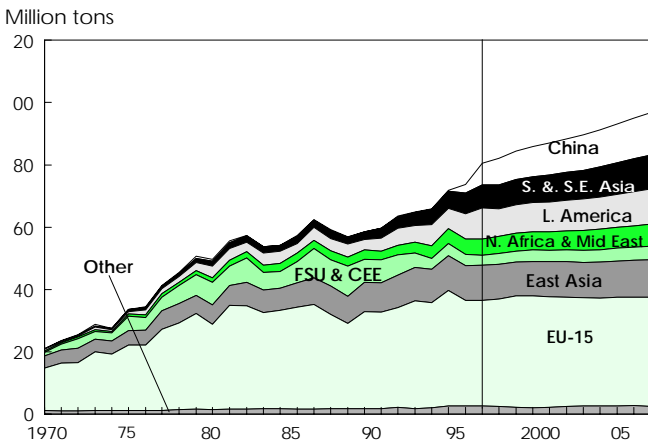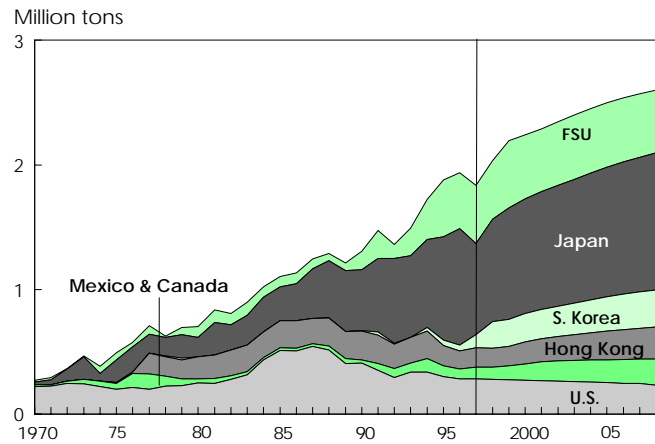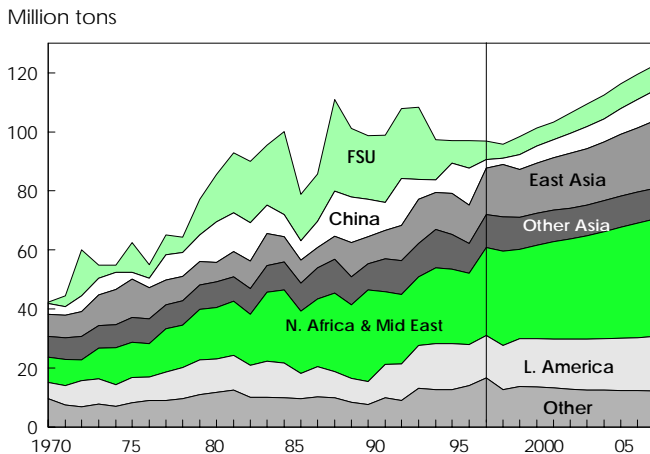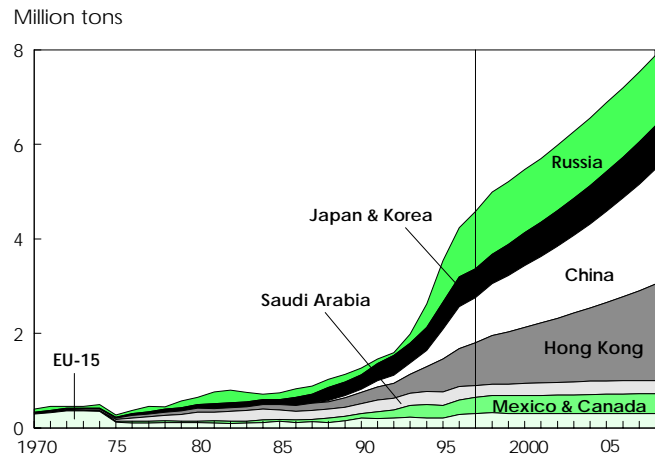
1998 forecast; 1999-2007 projected.

FSU = former Soviet Union; CEE = Central and Eastern Europe.

Economic Research Service, USDA

Effects of Asia Financial Crisis on U.S. Agricultural Trade Value

The macroeconomic assumptions used for the USDA baseline were made in the fall of 1997 when the outcome of the Asian financial crisis was highly uncertain. The baseline assumed a moderate Asian crisis scenario in which the currency devaluations and related economic slowdowns were confined to Thailand, Indonesia, Malaysia, and the Philippines, not spreading to other countries in East Asia, South Asia, or China. Impacts on those four Southeast Asian countries were assumed to affect growth only through 2000, with policy reforms and international financial support leading to a recovery of economic growth in subsequent years.

A more recent analysis of the impacts of the Asian financial crisis was conducted by USDA in late December 1997, after the baseline was completed (*AO* February 1998). For this analysis, growth and exchange rate impacts in the four major Southeast Asian economies were deepened from those assumed in this baseline, and impacts were extended to Japan, Korea, Taiwan, Australia, Argentina, Brazil, and Mexico. Growth and exchange rate impacts were assumed

for 1997-2000, with the crisis resolved in 3 to 4 years. Income growth was slowed for China, but no devaluation was assumed.

In addition to the moderate impacts of the Asia crisis on U.S. agricultural exports of about 1 percent annually already included in the baseline projections, the late-December assessment estimated that U.S. agricultural exports would be further reduced by 3 percent in 1998, 5 percent in 1999, and 4 percent in 2000. Annual exports in later years would reflect the degree of economic recovery in affected countries. In this worsened crisis scenario, fiscal-year 1998 impacts affect high-value product exports, such as meats and horticultural products, more than bulk commodity exports. Export reductions for bulk commodities and high-value products are about equal in later years. These estimated reductions reflect only the effects of the Asia crisis and do not include other changes in the trade outlook that occurred since the baseline analysis was conducted.

trend upward during 1998-2007, with the U.S. market share remaining near 25 percent.

Meat Trade To Sustain Growth

Rising meat demand and increased market access in East Asia and China are expected to be the key sources of sustained growth in world beef, pork, and poultry trade. Much of the growth in beef and veal import demand is projected in the Pacific Rim countries, where higher incomes and lower trade barriers, which reduce internal prices, are expected to increase demand. While economic problems associated with the Asian currency crisis may slow Asian imports in the near term, significant growth is expected in the longer term. Larger beef imports are expected by Mexico and Russia, where income growth will increase beef demand more rapidly than domestic production can respond.

The U.S., Australia, and Argentina are all projected to continue to increase beef exports through 2007, with Australia and the U.S. likely to vie for the role of leading exporter. Argentina has the potential to expand sales to new markets now that it has been recognized as free of foot-and-mouth disease (FMD) and is projected to gradually expand exports to become the fourth largest beef exporter. Cutbacks in subsidized EU exports and a reduction in beef production in New Zealand will limit export growth.

World pork trade is projected to continue to expand, driven largely by rising demand in several of the major pork importers,

including Mexico, Japan, and Hong Kong. The FSU and Central and Eastern Europe are expected to have significant, although somewhat variable, influence on the world market. The U.S. will assume a dominant export role in global pork trade, increasing exports by almost 70 percent between 1998 and 2007. Robust U.S. export growth reflects a restructured U.S. pork industry with greater export orientation and internationally competitive costs. The U.S. is expected to gain market share from Taiwan, whose exports of pork are assumed to cease until 2003 in the aftermath of the FMD outbreak in 1997. EU pork exports will increase, as it continues to export unsubsidized pork over and above the Uruguay Round limits on subsidized exports.

Continued rapid growth in poultry meat trade is projected, based on anticipated gains in the largest import markets, including the FSU, China, Japan, Hong Kong, Mexico, Canada, and the Middle East. Most of the growth in world trade is expected to come from expanded shipments of relatively low-priced poultry parts, especially in emerging markets in middle- and lower-income countries. The U.S. is expected to maintain a large share of this expanding market since many of those products are less preferred in the U.S. Exports of processed products are expected to grow, but to remain a relatively small percentage of total trade.
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mlandes@econ.ag.gov **AO**

Some Sources of Uncertainty in Trade Prospects

Global trade prospects in the baseline are bright for the next 10 years. However, as much as any time in the recent past, they are subject to an array of both general and country-specific uncertainties. Among these is the potential for an economic shock, such as the Asian financial crisis, to create a sustained slowdown in economic growth across a number of significant developing country markets. Another concerns the degree to which agricultural supplies, particularly in developing and transition economies, respond to the introduction of biotechnology as well as to the new macroeconomic and price environment they are expected to face over the next 10 years.

Country-specific uncertainties include the potential for different but plausible assumptions on key policies or on technical parameters in specific countries—such key markets and competitors as China, the European Union (EU), and the former Soviet Union (FSU)—to significantly alter global market projections.

Developing Countries' Economic Growth Is Critical

Prospects for stronger growth in per capita incomes across most developing and transition regions during 1998-2007, compared with the 1980's and early 1990's, are central to the projected expansion of bulk commodity trade. To a significant extent, the favorable outlook should be resilient to shocks because it rests on such factors as more coordinated macroeconomic management in developed countries, greater commitment to market-oriented policies in developing and transition regions, and an increasingly open world trading system.

Any number of events could alter this economic outlook. The ongoing financial crisis in Asia is the most obvious. Other possi-

ble scenarios include a new oil price shock stemming from disrupted Middle East supplies, or a loss of political support for sustaining reforms in such areas as Latin America and the FSU. However, in order to fundamentally alter the currently broad-based demand outlook, the economic shocks would need to be sustained and affect a number of significant markets.

A December 1997 analysis of the Asian financial crisis by USDA's Economic Research Service indicates that the crisis could push major commodity prices down 2-5 percent during 1997-2000, compared with the baseline projections, and bring reductions in world trade volumes of 1-4 percent. Global trade impacts are softened because the most seriously affected Southeast Asian countries, while growing rapidly, still account for small shares of world trade, and the larger East Asian markets are relatively inelastic to income and price shocks. Also important, lower prices will push up import volumes in some other markets.

Supply Response Difficult To Predict

The baseline real price projections for major commodities are above the long-term trend, implying that gains in agricultural production will not continue to outpace demand at the same rate as in the past. Stronger gains in productivity, particularly on the part of competitors, would undermine the projected strength of U.S. farm exports and income.

A number of factors make it particularly difficult to predict productivity gains confidently during the projection period. More market-oriented farm policies in the U.S. and elsewhere will make farm output more responsive to price changes, but

Yield Growth Is Projected To Slow in Developing Economies
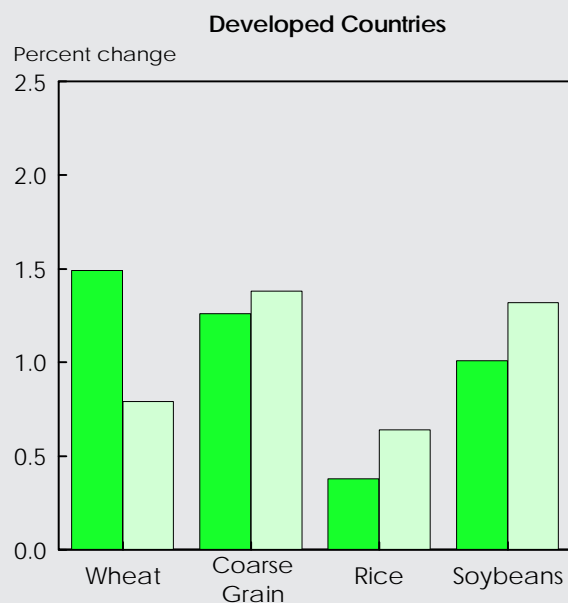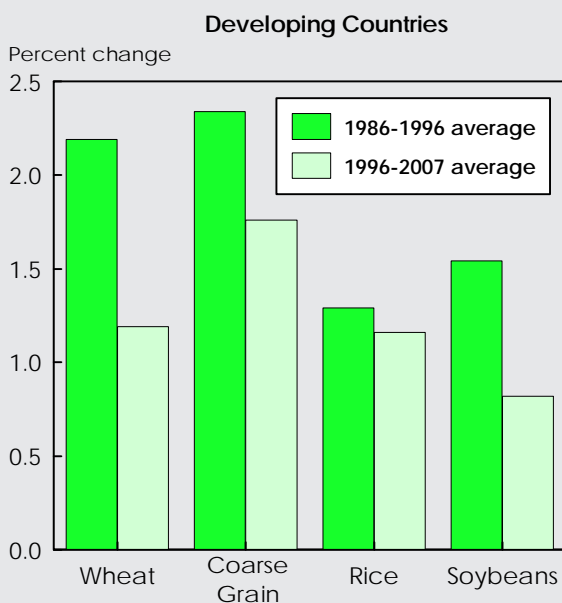
1998 forecast; 1999-2007 projected.
Economic Research Service, USDA

Special Article

the degree of price-responsiveness is difficult to predict. Many developing and transition economies, particularly those in Latin America and Central and Eastern Europe (CEE), are expected to have vastly improved macroeconomic conditions that are more conducive to investment and productivity gains than has been the case in the past 10 years.

Another potentially significant factor is the possibility in both developed and developing countries for faster gains in crop and livestock productivity through biotechnology. Finally, it is unclear to what extent environmental and resource constraints—including water shortages, soil degradation, and pest management problems—will affect farm output.

The productivity growth rates included in the baseline attempt to account for these dynamics but generally call for slower growth in crop yields than occurred during 1986-96, particularly in developing countries. But, given the significant change in the economic, policy, and technology climate, alternative outcomes for productivity gains are possible. Recent large gains in cropped area and input use in Argentina, and evidence of improved incentives for producers and investors in agricultural infrastructure in Brazil, indicate the possibility of larger supply responses than anticipated in the baseline.

China's Trade Remains a Big Question

China's future role in world markets is probably the largest source of uncertainty in the trade outlook for many agricultural commodities. USDA projections for China indicate that dynamic economic growth will increase demand for foods and feeds faster than production capacity, because of China's limited resource base. It is assumed that trade policy will be increasingly open and practical, allowing relatively low-priced imports to meet a growing share of demand, particularly in urban and coastal areas.

While the data available for China, together with the paths taken in neighboring countries, tend to support this general story, the data on virtually all aspects of agricultural production and consumption in China may not be accurate. In most cases, current levels of trade are so small relative to domestic supply and use that minor, and entirely plausible, changes in assumptions can alter trade projections significantly.

The most reliable agricultural data for China are trade data, which are verified by partner country information. A current concern is that recent declines in China's imports of two key commodities, wheat and corn, are not explained by other available data. This recent trade behavior raises questions about the data on such variables as crop area, yields, food use, feed use, and stocks, as well as baseline projections based on those data. Reducing the uncertainty created by China in the outlook will require improvement in the availability and reliability of data.

EU Policy Management Will Affect Markets

There is significant uncertainty about the measures the EU will use to meet its subsidized export and minimum import commitments under the Uruguay Round agreement. Alternative assumptions on management of the current Common Agricultural Policy (CAP) or for introduction of reforms under the Agenda 2000 initiative could have significant impacts on the baseline projections for such commodities as wheat and coarse grain.

China Grain Trade Remains Hard To Predict
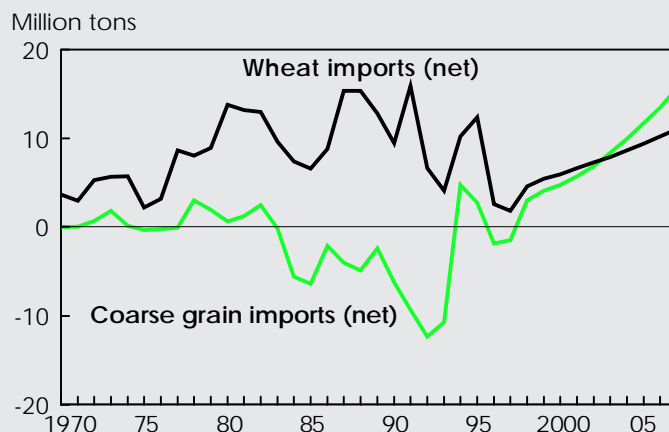
Economic Research Service, USDA

The baseline assumes that the EU will use current CAP policy mechanisms to meet its Uruguay Round limits on subsidized exports. For grains, it is assumed that any production in excess of intervention purchases and onfarm use that cannot be exported will depress the internal market price and dampen output. Exports without subsidy occur only when the world price is equal to or greater than the average EU price. It is assumed that the land set-aside rate will be adjusted to constrain surplus production. The set-aside rate is set at 5 percent from 1997/98 to 1999/2000, and then increased to 10 percent through 2007. Under baseline market conditions, maintaining a 5-percent set-aside would likely generate surplus stocks of wheat and barley, while raising the set-aside toward the EU statutory level of 17.5 percent would preclude opportunities to export wheat without subsidy. In the longer term, it is assumed that the EU will not allow stocks to accumulate above the historical average level; larger stocks are viewed as a short-term strategy for dealing with excess supplies.

Alternative EU policy scenarios are plausible under the CAP and could have significant market impacts. A higher EU set-aside would reduce projected EU exports of wheat and barley, likely pushing up U.S. wheat and corn exports. A smaller set-aside could produce significantly more competition for U.S. wheat exports, but since it is very unlikely that EU barley could be exported without subsidy, this scenario would likely require holding large barley stocks or somehow reducing internal barley prices to stimulate barley feed use.

Implementation of reforms under the EU's Agenda 2000 initiative, which has proposed shifting toward world prices for grains and eliminating the set-aside, could have a major impact on projections. Although some type of reform seems likely during the projection period, such measures have not been included in the baseline because both the nature and timing of the eventual package of reforms are too uncertain. Such changes, if implemented, would likely increase EU competitiveness in the world wheat market, while limiting coarse grain exports.

Transition Economies Create Large Uncertainties

Future developments in both consumer demand and farm output in the larger agricultural economies of the FSU and Central and Eastern Europe will be very important to global markets and particularly hard to assess. For the FSU, current USDA projections call for a recovery to only modest rates of economic growth, very limited gains in farm productivity, and small levels of grain exports through 2007. Stronger growth in incomes, productivity, and export competitiveness are projected for the CEE region. The outcomes for each region are difficult to project because they are dependent on the uncertain pace of policy and institutional reforms, and because the economic responses of producers and consumers in their new policy environment are hard to predict.

For the FSU, the projections assume that liberalization of markets and restructuring of agricultural enterprises will continue at their current slow pace. Crop productivity gains in the FSU are expected to be small, largely because little progress is anticipated in land reform. Grain exports out of the region are expected to remain hampered by high internal transport costs. Livestock production is assumed to recover very slowly because of the slow progress of economic reforms that could reduce production costs and increase competitiveness. Faster progress in reforms to agricultural input and output markets or in improving transport infrastructure could lead to significantly more FSU competition in global grain markets than included in current USDA projections.

The CEE projections incorporate a steady increase in efficiency in the agricultural sector, reflected in rising yields and greater feeding efficiency in the livestock sector. Projected productivity gains are stronger than in the FSU because of rising incomes, lower interest rates, greater progress in implementing reforms, and growing investment in both agriculture

and food processing. With these assumptions, the baseline projects modest growth in the region's exports of grains and livestock products. Significantly faster or slower growth in exports is plausible, however, depending on the pace of reforms and the economic responses of producers and consumers.

Potential for Multilateral Policy Change

While the USDA baseline allows the policies of individual countries to continue to evolve in a manner consistent with past trends and analyst judgment, assumptions on bilateral, regional, and multilateral policy are based solely on agreements in place as of November 1997. Although a number of policy changes under discussion may occur during the projection period (enlargement of the EU-15 to include one or more of the CEE countries and WTO accession by China and Taiwan), the terms and timing of such agreements are too uncertain to include in the baseline.

The EU's Agenda 2000 communication recommends that accession negotiations begin with Hungary, Poland, Estonia, the Czech Republic, and Slovenia in 1998, with the actual timetable dependent on progress in meeting policy targets. A preliminary ERS analysis covering a slightly different group of countries (Hungary, Poland, Czech Republic, and Slovakia) indicates the potential impacts of enlargement under two policy scenarios: one where current CAP policies are applied to the acceding CEE countries, and another where agriculture in the enlarged EU shifts to world prices and the acreage set-aside program is abolished (*AO* June 1997). Both scenarios require major adjustments. When adopting the relatively high EU CAP prices, the CEE countries expand output sharply and reduce consumption. Under the terms of the current CAP, grain exports of the EU-19 would likely fall, with higher feed use in countries of the current EU-15 more than offsetting increased production in the CEE countries.

FSU and CEE Grain Production and Use Recover Slowly

Former Soviet Union
Million tons

Central & Eastern Europe
Million tons
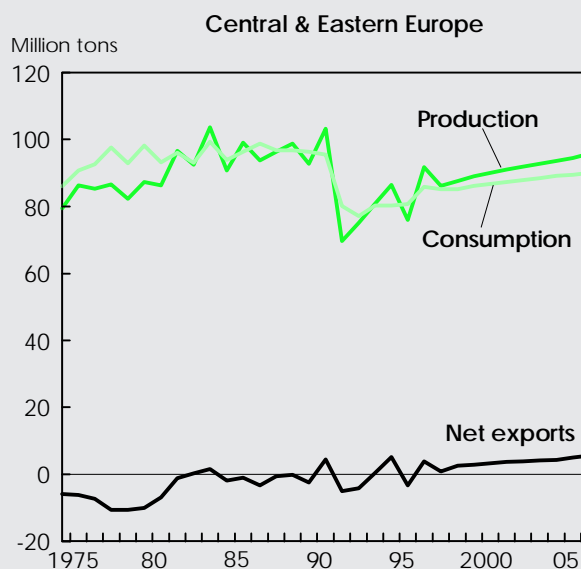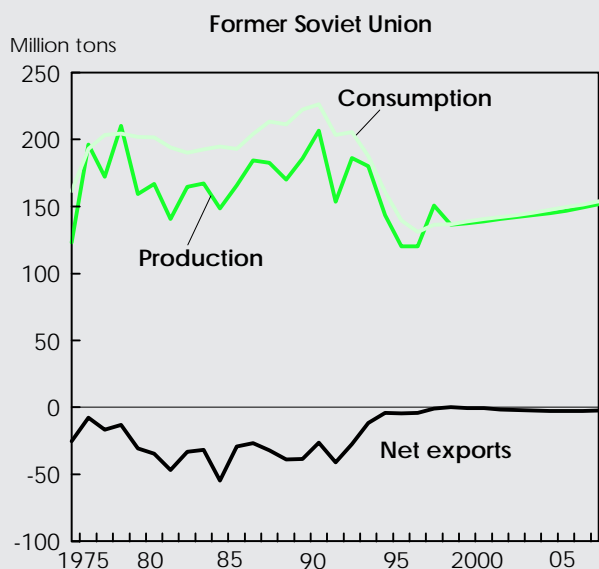
1998 forecast; 1999-2007 projected.
Economic Research Service, USDA

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Estimated Impacts on World Grain Trade of China and Taiwan WTO Accession
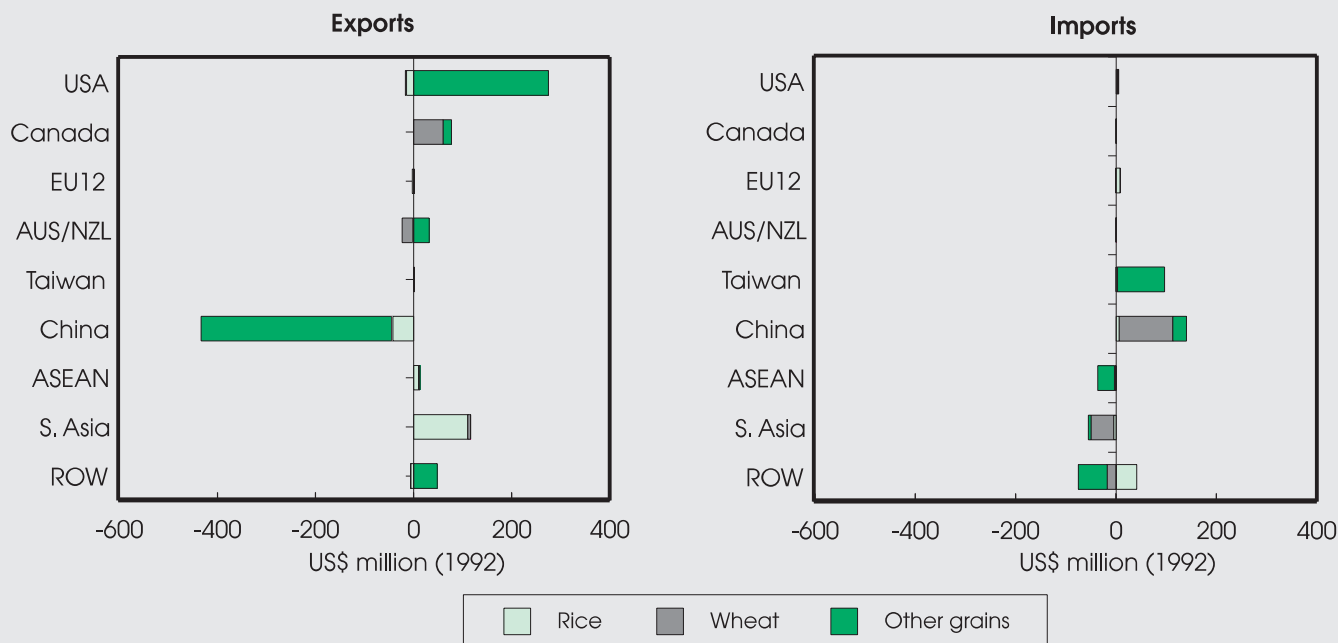
Economic Research Service

If the enlarged EU-19 shifted to world prices, which are below CAP prices, the increase in CEE production would be smaller, but there would be significant declines in production and increases in consumption in the EU-15. If the EU-19 adopted world prices and abolished the set-aside, the analysis suggests larger wheat exports, as well as larger coarse grain imports.

The terms of a possible accession to the World Trade Organization (WTO) by China and Taiwan are under discussion, with much uncertainty about required policy reforms and timing. A recent ERS study suggests the potential impacts of accession (*AO* July 1997). For agriculture, the results indicate a 3-percent increase in world trade, led by an $8-billion increase in China's annual net agricultural imports. Modest increases are predicted in world agricultural product prices, with the largest impact on coarse grain prices. Larger grain imports are indicated for China and Taiwan and larger exports by North America, Southeast Asia, and South Asia. U.S. agriculture benefits from higher exports, farm income, and export prices.

Uncertainty in Long-Term Outlook Will Continue

Just as weather shocks and business cycles affect short-term developments, the long-term trade outlook can be fundamentally changed by alternate outcomes in each of these trade-related areas of uncertainty. Although analysts will continue to improve their understanding of these issues, many important components of the long-term outlook are likely to remain uncertain.

In some areas, including supply response and developments in transition economies, sharp changes in policy regimes can mean that historical behavior offers relatively few clues about future responses. In other areas, particularly China, analytical problems associated with poor data and unclear policies defy an immediate solution. Likewise, the potential for unilateral policy change by significant players in the markets will remain a source of uncertainty.

On the other hand, current prospects for stronger and broad-based growth in developing countries will likely be an important source of resiliency in the baseline outlook for strong growth in bulk commodity demand. Another source of resiliency could be continued progress in implementing bilateral or multilateral policy reforms that can further expand global and U.S. trade, particularly for high-value agricultural products.
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Statistical Indicators

Summary Data

Table 1—Key Statistical Indicators of the Food & Fiber Sector

	Annual			1997				1998		
	1996	1997	1998 F	I	II	III	IV F	I F	II F	III F
Prices received by farmers (1990-92=100)	112	107	--	107	108	107	106	--	--	--
Livestock & products	99	99	--	98	99	99	97	--	--	--
Crops	126	115	--	116	117	115	113	--	--	--
Prices paid by farmers (1990-92=100)										
Production items	115	116	--	115	117	116	115	--	--	--
Commodities and services, interest, taxes, and wages	115	116	--	116	117	116	116	--	--	--
Cash receipts ($ bil.)[1]	202	201	198	48	44	49	61	48	42	48
Livestock	93	93	91	23	23	23	23	23	22	23
Crops	109	109	107	25	21	26	38	25	20	25
Market basket (1982-84=100)										
Retail cost	156	160	--	160	159	160	161	--	--	--
Farm value	111	106	--	107	107	106	105	--	--	--
Spread	180	189	--	188	187	189	191	--	--	--
Farm value/retail cost (%)	25	23	--	24	24	23	23	--	--	--
Retail prices (1982-84=100)										
All food	153	157	161	157	157	158	159	160	160	161
At home	154	158	161	158	158	158	159	160	161	161
Away from home	153	157	161	156	156	157	159	159	160	161
Agricultural exports ($ bil.)[2]	59.8	57.3	56.0	14.9	13.2	12.9	16.3	14.4	12.9	12.5
Agricultural imports ($ bil.)[2]	32.4	35.8	38.0	9.1	9.3	8.7	9.2	9.4	9.5	9.9
Commercial production										
Red meat (mil. lb.)	43,135	43,209	44,773	10,452	10,651	10,939	11,167	11,209	11,074	11,342
Poultry (mil. lb.)	32,289	33,235	34,330	7,994	8,491	8,395	8,355	8,235	8,665	8,755
Eggs (mil. doz.)	6,358	6,460	6,625	1,592	1,595	1,606	1,667	1,630	1,640	1,665
Milk (bil. lb.)	154.3	156.6	157.2	39.0	40.7	38.8	38.2	39.2	40.9	38.7
Consumption, per capita										
Red meat and poultry (lb.)	209.2	208.5	215.8	49.8	52.3	52.5	53.8	53.0	53.8	54.4
Corn beginning stocks (mil. bu.)[3]	1,557.8	425.9	883.2	425.9	6,903.0	4,494.1	2,496.6	883.2	7,229.8	--
Corn use (mil. bu.)[3]	8,522.3	8,849.5	9,310.0	2,819.8	2,411.2	2,001.3	1,617.1	3,021.1	--	--
Prices[4]										
Choice steers--Neb. Direct ($/cwt)	65.21	66.32	64-68	66.40	66.63	65.65	66.61	61-62	63-67	64-70
Barrows and gilts--IA, So. MN ($/cwt)	53.39	51.36	36-38	51.06	56.41	54.45	43.53	34-35	37-39	39-43
Broilers --12-city (cents/lb.)	61.2	58.80	55-58	60.00	59.10	62.00	54.00	55-56	56-58	57-61
Eggs--NY gr. A large (cents/doz.)	88.2	81.20	74-79	84.90	72.10	79.70	88.20	78-79	68-72	72-78
Milk--all at plant ($/cwt)	14.87	13.38	13.40-14.00	13.47	12.93	12.70	14.40	14.45-14.65	12.80-13.30	12.50-13.30
Wheat--KC HRW ordinary ($/bu.)	5.48	3.82	--	4.57	4.49	3.76	4.16	--	--	--
Corn--Chicago ($/bu.)	3.87	2.74	--	2.86	2.86	2.64	2.78	--	--	--
Soybeans--Chicago ($/bu.)	7.53	7.60	--	8.54	7.19	6.95	--	--	--	--
Cotton--avg. spot 41-34 (cents/lb)	77.93	69.89	--	69.81	71.40	67.64	--	--	--	--
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Farm real estate values[5,6]										
Nominal ($ per acre)	632	668	683	703	713	736	782	832	890	945
Real (1982 $)	530	539	528	521	507	511	529	550	574	598

F = Forecast. -- = Not available. 1. Quarterly data seasonally adjusted at annual rates. 2. Annual data based on Oct.-Sept. fiscal years ending with year indicated. 3. Sept.-Nov. first quarter; Dec.-Feb. second quarter; Mar.-May third quarter; Jun.-Aug. fourth quarter; Sept.-Aug. annual. Use includes exports and domestic disappearance. 4. Simple averages, Jan.-Dec. 5. 1990-94 values as of January 1. 1986-89 values as of February 1. 6. The 1989-94 values are revised based on the 1992 Census of Agriculture.

U.S. & Foreign Economic Data

Table 2—U.S. Gross Domestic Product & Related Data

	Annual			1996			1997			
	1995	1996	1997	II	III	IV	I	II	III	IV
Billions of current dollars (quarterly data seasonally adjusted at annual rates)										
Gross Domestic Product	7,265.4	7,636.0	8,081.0	7,607.7	7,676.0	7,792.9	7,933.6	8,034.3	8,124.3	8,231.8
Gross National Product	7,270.6	7,637.7	--	7,610.5	7,669.1	7,796.1	7,919.2	8,013.6	8,103.5	--
Personal consumption										
expenditures	4,957.7	5,207.6	5,488.1	5,189.1	5,227.4	5,308.1	5,405.7	5,432.1	5,527.4	5,587.2
Durable goods	608.5	634.5	659.1	638.6	634.5	638.2	658.4	644.5	667.3	666.2
Nondurable goods	1,475.8	1,534.7	1,592.1	1,532.3	1,538.3	1,560.1	1,587.4	1,578.9	1,600.8	1,601.4
Food	735.1	756.1	776.5	752.2	757.4	766.6	775.5	771.4	779.3	779.6
Clothing and shoes	254.7	264.3	277.2	265.7	265.7	266.2	275.2	274.8	280.5	278.5
Services	2,873.4	3,038.4	3,236.9	3,018.2	3,054.6	3,109.8	3,159.9	3,208.7	3,259.3	3,319.6
Gross private domestic investment	1,038.2	1,116.5	1,240.9	1,105.4	1,149.2	1,151.1	1,193.6	1,242.0	1,250.2	1,277.8
Fixed investment	1,008.1	1,090.7	1,172.6	1,082.0	1,112.0	1,119.2	1,127.5	1,160.8	1,201.3	1,200.8
Change in business inventories	30.1	25.9	68.3	23.4	37.1	31.9	66.1	81.1	48.9	77.0
Net exports of goods and services	-86.0	-94.8	-100.8	-93.8	-114	-88.6	-98.8	-88.7	-111.3	-104.2
Government consumption expenditures										
and gross investment	1,355.5	1,406.7	1,452.7	1,407.0	1,413.5	1,422.3	1,433.1	1,449.0	1,457.9	1,470.9
Billions of 1992 dollars (quarterly data seasonally adjusted at annual rates) [1]										
Gross Domestic Product	6,742.1	6,928.4	7,189.6	6,926.0	6,943.8	7,017.4	7,101.6	7,159.6	7,214.0	7,283.3
Gross National Product	6,748.7	6,932.0	--	6,930.1	6,940.2	7,023.1	7,091.8	7,144.4	7,198.8	--
Personal consumption										
expenditures	4,595.3	4,714.1	4,869.3	4,712.2	4,718.2	4,756.4	4,818.1	4,829.4	4,896.2	4,933.5
Durable goods	583.6	611.1	645.5	614.8	611.9	617.1	637.8	629.0	656.1	658.9
Nondurable goods	1,412.6	1,432.3	1,458.8	1,431.6	1,433.9	1,441.2	1,457.8	1,450.0	1,465.5	1,461.9
Food	690.5	689.7	689.9	690.3	687.3	689.0	694.6	688.2	689.5	687.4
Clothing and shoes	257.5	267.7	277.9	268.4	270.8	270.0	277.1	273.8	281.3	279.3
Services	2,599.6	2,671.0	2,765.7	2,666.5	2,672.8	2,698.2	2,723.9	2,749.8	2,776.1	2,812.9
Gross private domestic investment	991.5	1,069.1	1,195.7	1,059.2	1,100.3	1,104.8	1,149.2	1,197.1	1,204.6	1,231.8
Fixed investment	962.1	1,041.7	1,122.2	1,035.7	1,060.9	1,068.7	1,079.0	1,111.4	1,149.3	1,149.2
Change in business inventories	27.3	25.0	65.7	21.3	37.9	32.9	63.7	77.6	47.5	74.0
Net exports of goods and services	-98.8	-114.4	-146.4	-112.6	-138.9	-105.6	-126.3	-136.6	-164.1	-158.5
Government consumption expenditures										
and gross investment	1,251.9	1,257.9	1,269.7	1,265.1	1,261.5	1,261.8	1,260.5	1,270.1	1,273.4	1,274.7
GDP implicit price deflator (% change)	2.5	2.3	2.0	1.7	2.6	1.9	2.4	1.8	1.4	1.4
Disposable personal income ($ bil.)	5,355.7	5,608.3	5,885.5	5,573.5	5,644.6	5,695.8	5,790.5	5,849.9	5,908.9	5,992.8
Disposable per. income (1992 $ bil.)	4,964.2	5,076.9	5,221.9	5,061.3	5,094.8	5,103.8	5,161.1	5,200.9	5,234.1	5,291.6
Per capita disposable pers. income ($)	20,349	21,117	21,972	21,012	21,229	21,373	21,689	21,865	22,034	22,297
Per capita disp. pers. income (1992 $)	18,861	19,116	19,494	19,081	19,161	19,152	19,331	19,439	19,518	19,688
U.S. resident population plus Armed										
Forces overseas (mil.)[2]	263.2	265.6	267.8	265.2	265.8	266.4	266.9	267.4	268.1	268.9
Civilian population (mil.)[2]	261.5	264.0	266.3	263.6	264.2	264.9	265.4	265.9	266.5	267.3

	Annual			1997						1998
	1995	1996	1997	Jan	Aug	Sep	Oct	Nov	Dec	Jan
Monthly data seasonally adjusted										
Total industrial production (1992=100)	116.0	120.2	127.0	123.5	127.9	128.0	129.1	130.4	130.9	131.2
Leading economic indicators (1992=100)	100.8	102.0	103.8	102.8	104.1	104.3	104.4	104.5	104.5	104.5
Civilian employment (mil. persons)[3]	124.9	126.7	129.6	128.5	129.7	129.8	129.9	130.6	130.8	131.1
Civilian unemployment rate (%)[3]	5.6	5.4	4.9	5.3	4.7	4.9	4.8	4.6	4.7	4.7
Personal income ($ bil. annual rate)	6,150.8	6,495.2	6,874.2	6,700.1	6,974.4	6,935.5	6,970.7	7,021.5	7,052.7	7092.8
Money stock-M2 (daily avg.) ($ bil.)[4]	3,651.2	3,826.1	4,040.2	3,840.7	3,953.1	3,973.8	3,993.2	4,017.5	4,040.2	4064.5
Three-month Treasury bill rate (%)	5.50	5.00	5.10	5.10	4.95	5.00	5.00	5.20	5.20	5.10
AAA corporate bond yield (Moody's) (%)	7.60	7.40	7.30	7.40	7.00	7.20	7.00	6.90	6.80	6.60
Total housing starts (1,000)[5]	1,354.1	1,476.8	1,474.0	1,394	1,383	1,501	1,529	1,523	1,538	1,534
Business inventory/sales ratio[6]	1.40	1.39	1.37	1.37	1.37	1.36	1.37	1.38	1.40	--
Sales of all retail stores ($ bil.)[7]	2,346.3	2,465.1	2,546.3	209.3	213.5	213.8	213.5	213.8	214.9	217.0
Nondurable goods stores ($ bil.)	1,405.6	1,457.8	1,505.4	124.2	126.7	126.8	126.7	126.2	125.9	126.7
Food stores ($bil.)	408.4	424.2	432.1	35.8	36.3	36.3	36.3	36.4	36.2	36
Apparel and accessory stores ($ bil.)	109.5	113.0	116.8	9.6	9.8	9.8	9.8	9.8	9.8	10
Eating and drinking places ($ bil.)	239.9	238.4	244.1	20.2	20.5	20.6	20.5	20.3	20.5	20.6

P = Preliminary. R = Revised. -- = Not available. 1. In April 1996, 1992 dollars replaced 1987 dollars. 2. Population estimates based on 1990 census. 3. Data beginning January 1994 not directly comparable with data for earlier periods because of a major redesign of household survey questionnaire. 4. Annual data as of December of year listed. 5. Private, including farm. 6. Manufacturing and trade. 7. Annual total. *Information contact: David Johnson (202)694-5324*

Table 3—World Economic Growth

	Calendar Year*									
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
	Real GDP, annual percent change									
World	3.6	2.4	1.8	1.7	1.2	2.4	2.2	2.9	3.1	2.6
World, less U.S.	3.6	2.9	2.8	1.3	0.8	2.0	2.3	3.0	2.9	2.5
Developed	3.7	2.6	1.8	1.6	0.7	2.4	1.8	2.5	2.7	2.4
Developed, less U.S.	3.8	3.4	3.3	1.1	-0.1	1.8	1.7	2.3	2.0	2.2
U.S.	3.4	1.3	-1.0	2.7	2.2	3.5	2.0	2.8	3.8	2.8
Canada	2.4	-0.3	-1.8	0.8	2.3	4.6	2.2	1.5	3.7	3.0
Japan	4.9	5.1	4.0	1.0	0.1	0.4	0.9	3.7	0.9	1.0
Australia	3.0	-0.8	0.2	3.3	4.9	4.2	3.3	4.1	3.2	2.8
European Union	3.5	3.0	3.6	1.1	-0.6	2.1	1.9	1.6	2.5	2.7
France	4.3	2.5	0.8	1.3	-1.4	2.7	2.2	1.2	2.4	2.6
Germany	3.6	5.7	13.2	2.2	-1.1	0.0	0.0	1.4	2.2	2.7
Italy	2.9	2.1	1.2	0.7	-1.2	2.2	3.0	0.8	1.5	2.1
Spain	4.8	3.7	2.3	0.7	-1.2	2.1	3.0	2.3	3.3	3.3
United Kingdom	2.2	0.4	-2.0	-0.5	2.2	3.8	2.4	2.3	3.3	2.7
Central Europe	-0.6	-6.3	-10.6	-3.8	0.5	3.4	5.3	2.8	1.5	3.7
Poland	0.3	-10.8	-6.3	2.0	3.7	4.6	6.6	5.5	6.4	5.1
Former Soviet Union	2.1	-3.7	-5.7	-13.6	-9.7	-14.7	-5.4	-6.4	0.2	0.3
Russia	1.9	-3.6	-5.0	-14.5	-8.7	-12.6	-4.0	-6.0	0.4	0.5
Ukraine	3.9	-3.8	-8.4	-9.7	-14.2	-23.5	-11.8	-10.0	-1.1	-1.7
Developing	3.8	3.5	4.0	5.2	5.1	4.7	4.7	5.6	5.2	3.3
Asia	6.1	6.1	6.0	8.1	7.9	8.8	8.3	7.6	6.3	3.5
East & SE Asia	6.2	6.4	8.1	9.2	9.5	9.9	9.1	7.9	6.6	3.0
China	4.1	3.7	9.5	14.6	13.9	13.0	10.7	9.7	8.8	7.2
Indonesia	9.0	8.9	8.9	7.2	7.2	7.5	8.1	8.0	4.6	-5.1
Korea	6.4	9.7	9.2	5.0	5.8	8.4	9.0	7.1	5.5	-2.3
Malaysia	9.1	9.7	8.8	7.8	8.4	9.4	9.4	8.2	6.8	2.0
Philippines	6.2	2.7	-0.2	0.3	2.1	4.4	4.8	5.5	5.3	2.6
Taiwan	7.4	5.3	7.5	6.8	6.3	6.5	6.0	5.7	6.8	5.4
Thailand	12.2	11.7	8.0	8.1	8.3	8.8	8.7	6.7	0.5	-3.0
South Asia	6.1	5.6	1.2	5.4	3.8	5.9	5.8	6.5	5.4	5.1
India	6.6	5.6	0.5	5.3	4.0	6.3	6.1	6.8	5.7	5.3
Pakistan	4.8	4.5	5.5	7.8	1.9	3.9	4.4	5.6	3.7	4.0
Latin America	1.0	-0.1	3.4	2.8	3.6	1.2	0.0	3.3	5.1	3.0
Mexico	3.4	4.5	3.6	2.9	0.7	3.6	-7.2	5.1	7.0	4.8
Caribbean/Central	4.6	1.0	2.4	4.2	3.7	2.4	2.8	3.0	3.0	3.1
South America	-0.1	-1.4	3.5	2.6	4.4	5.4	1.8	2.9	4.7	2.5
Argentina	-6.3	0.2	8.9	8.6	6.0	7.4	-4.6	3.8	7.8	4.2
Brazil	3.3	-4.6	0.5	-1.2	4.5	5.8	3.0	2.9	3.5	0.7
Colombia	3.4	4.1	1.8	4.2	5.2	5.8	5.3	3.0	3.0	4.0
Venezuela	-8.7	6.6	9.7	6.1	0.3	-2.8	2.2	-1.6	5.0	4.3
Middle East	3.4	4.8	2.6	5.3	4.7	0.7	3.4	4.4	3.5	3.3
Israel	0.9	6.8	7.7	5.6	5.6	6.9	7.0	4.4	2.0	4.6
Saudi Arabia	0.0	8.7	8.4	2.8	-0.6	0.5	-0.5	2.8	2.8	3.0
Turkey	0.2	8.7	1.1	6.0	7.7	-5.0	7.0	7.5	6.4	5.0
Africa	3.3	1.5	0.8	0.5	-0.7	1.9	2.2	3.6	2.9	3.0
North Africa	3.3	2.2	1.6	0.8	-0.5	2.1	1.8	4.2	2.8	3.4
Egypt	3.0	2.4	2.1	0.3	0.5	2.0	2.4	4.3	4.9	4.5
Sub-Sahara	3.2	1.1	0.3	0.2	-0.8	1.7	2.4	3.2	2.9	2.8
South Africa	2.5	-1.0	-1.0	-2.6	1.3	2.4	3.4	3.2	1.6	2.3

*The last three years are either estimates or forecasts. *Information contact: Alberto Jerardo (202) 694-5323*

Farm Prices

Table 4—Indexes of Prices Received & Paid by Farmers, U.S. Average_____

	Annual			1997					1998	
	1995	1996	1997	Feb	Sep	Oct	Nov	Dec	Jan	Feb
					1990-92=100					
Prices received										
All farm products	102	112	107	105	107	107	107	105	103	100
All crops	112	126	115	113	114	115	114	111	110	108
Food grains	134	157	128	134	126	124	122	119	116	119
Feed grains and hay	112	146	117	118	114	113	112	112	113	112
Cotton	127	122	112	112	115	115	112	105	100	101
Tobacco	103	105	104	110	101	103	106	110	110	113
Oil-bearing crops	104	128	130	131	111	111	119	119	119	118
Fruit and nuts, all	100	118	109	92	135	129	114	89	77	86
Commercial vegetables	120	109	120	105	117	146	125	133	127	108
Potatoes and dry beans	107	114	93	86	88	86	93	96	99	102
Livestock and products	92	99	99	98	99	97	98	97	94	93
Meat animals	85	87	92	90	92	89	88	87	84	81
Dairy products	98	114	102	103	101	107	112	112	113	113
Poultry and eggs	107	120	114	118	116	108	113	107	105	104
Prices paid										
Commodities and services,										
interest, taxes, and wage rates	110	115	116	116	116	116	116	116	116	115
Production items	109	115	116	115	116	115	115	115	114	113
Feed	104	130	122	122	121	116	116	116	113	109
Livestock and poultry	82	75	93	89	96	94	93	94	92	93
Seeds	110	115	119	117	120	120	120	120	120	120
Fertilizer	120	124	121	124	119	119	117	115	114	114
Agricultural chemicals	115	119	121	118	121	122	123	123	124	125
Fuels	94	105	103	113	101	102	102	94	86	79
Supplies and repairs	112	115	117	116	118	118	118	118	118	118
Autos and trucks	107	108	109	110	108	109	109	109	109	110
Farm machinery	120	125	128	127	127	129	129	129	129	129
Building material	114	115	118	117	118	118	118	118	118	118
Farm services	118	118	118	117	119	118	118	117	116	116
Rent	116	119	119	119	119	119	119	119	124	124
Int. payable per acre on farm real estate debt	101	105	106	106	106	106	106	106	108	108
Taxes payable per acre on farm real estate	109	112	115	115	115	115	115	115	119	119
Wage rates (seasonally adjusted)	114	117	123	124	119	126	126	126	131	131
Production items, interest, taxes, and wage rates	109	114	116	116	116	115	115	115	115	115
Ratio, prices received to prices paid (%)*	93	98	92	91	92	92	92	91	89	87
Prices received (1910-14=100)	647	712	679	668	680	682	679	665	653	636
Prices paid, etc. (parity index) (1910-14=100)	1,437	1,504	1,527	1,523	1,527	1,525	1,524	1,520	1,523	1515
Parity ratio (1910-14=100) (%)*	45	47	45	44	45	45	45	44	43	42

Values for two most recent months are revised or preliminary. *Ratio of index of prices received for all farm products to index of prices paid for commodities and services, interest, taxes, and wage rates. Ratio uses the most recent prices paid index. Prices paid data are quarterly and are published in January, April, and October. *Information contact: David Johnson (202) 694-5324. For historical data or for categories not listed here, call the National Agricultural Statistics Service (NASS) Information Hotline at 1-800-727-9540. Internet users can access the NASS Home Page at http://www.usda.gov/nass.*

Table 5—Prices Received by Farmers, U.S. Average

	Annual[1]			1997					1998	
	1994	1995	1996	Feb	Sep	Oct	Nov	Dec	Jan	Feb
Crops										
All wheat ($/bu.)	3.45	4.55	4.30	3.89	3.67	3.55	3.50	3.45	3.33	3.36
Rice, rough ($/cwt)	6.78	9.15	9.50	10.10	9.85	10.10	9.71	9.67	9.52	9.53
Corn ($/bu.)	2.26	3.24	2.70	2.65	2.52	2.54	2.51	2.52	2.56	2.50
Sorghum ($/cwt)	3.80	5.69	4.20	4.17	3.99	4.06	3.93	3.94	4.02	4.07
All hay, baled ($/ton)	86.70	82.20	93.00	102.00	101.00	103.00	101.00	97.70	98.10	97.20
Soybeans ($/bu.)	5.48	6.72	6.85	7.38	6.72	6.50	6.85	6.71	6.69	6.63
Cotton, upland (cents/lb.)	72.00	75.40	70.60	68.10	69.40	69.60	67.60	63.80	60.80	61.10
Potatoes ($/cwt)	5.58	6.77	5.11	4.50	5.16	4.96	5.36	5.40	5.55	5.78
Lettuce ($/cwt)[2]	13.30	23.50	14.80	9.58	22.30	35.10	22.10	21.30	19.00	9.39
Tomatoes fresh ($/cwt)[2]	27.40	25.80	28.50	47.30	23.30	24.30	44.20	48.40	31.10	37.40
Onions ($/cwt)	9.87	9.87	9.58	7.87	10.70	9.44	10.20	10.90	13.20	15.50
Beans, dry edible ($/cwt)	22.50	20.80	24.20	23.60	16.30	16.90	18.30	20.20	21.10	21.70
Apples for fresh use (cents/lb.)	18.60	24.00	20.90	20.30	24.70	25.30	22.90	23.70	22.30	21.60
Pears for fresh use ($/ton)	223.00	272.00	375.00	519.00	360.00	334.00	330.00	287.00	253.00	260.00
Oranges, all uses ($/box)[3]	6.37	6.11	6.93	3.98	6.95	3.69	2.15	2.53	2.58	3.53
Grapefruit, all uses ($/box)[3]	5.26	4.61	4.63	1.32	4.18	4.15	2.49	2.57	1.79	1.61
Livestock										
Cattle, all beef ($/cwt)	66.50	61.80	58.70	61.90	63.60	63.30	63.30	62.90	62.50	60.00
Calves ($/cwt)	87.10	73.10	58.40	74.90	86.90	84.30	82.90	83.30	86.60	88.10
Hogs, all ($/cwt)	39.50	40.50	51.90	52.80	50.40	47.30	45.10	41.60	36.00	35.30
Lambs ($/cwt)	64.80	78.20	88.20	99.80	90.60	87.40	83.50	84.10	78.40	--
All milk, sold to plants ($/cwt)	13.01	12.78	14.75	13.50	13.20	14.00	14.60	14.60	14.70	14.70
Milk, manuf. grade ($/cwt)	11.85	11.79	13.43	12.40	12.70	13.20	13.60	13.50	13.50	13.50
Broilers, live (cents/lb.)	35.00	34.40	38.10	39.10	38.50	35.00	34.30	32.10	33.10	34.40
Eggs, all (cents/doz.)[4]	67.25	62.40	75.00	75.70	69.60	65.80	80.60	78.70	74.00	64.70
Turkeys (cents/lb.)	40.70	41.00	43.30	36.40	41.10	40.30	42.30	38.60	35.50	34.00

-- = Not available. Values for last two months revised or preliminary. 1.Season-average price by crop year for crops. Calendar year average of monthly prices for livestock. 2. Excludes Hawaii. 3. Equivalent on-tree returns. 4. Average of all eggs sold by producers including hatching eggs and eggs sold at retail. Information contact: David Johnson (202) 694-5324. For historical data or for categories not listed here, call the National Agricultural Statistics Service (NASS) Information Hotline at 1-800-727-9540. Internet users can access the NASS Home Page at http://www.usda.gov/nass

Producer & Consumer Prices

Table 6—Consumer Price Indexes for All Urban Consumers, U.S. Average (not seasonally adjusted)

	Annual			1997					1998	
	1995	1996	1997	Feb	Sep	Oct	Nov	Dec	Jan	Feb
					1982-84=100					
Consumer Price Index, all items	152.4	156.9	160.5	159.6	161.2	161.6	161.5	161.3	161.6	161.9
CPI, all items less food	153.1	157.5	161.1	160.2	161.8	162.2	162.1	161.8	161.9	162.3
All food	148.4	153.3	157.3	156.5	157.9	158.2	158.5	158.7	159.9	159.4
Food away from home	149.0	152.7	157.0	155.6	157.8	158.2	158.6	159.0	159.2	159.6
Food at home	148.8	154.3	158.1	157.7	158.6	159.0	159.1	159.2	161.0	160.0
Meats[1]	135.5	140.2	144.4	144.0	145.6	145.2	144.6	143.4	143.2	142.4
Beef and veal	134.9	134.5	136.8	136.6	137.2	137.1	137.0	136.9	136.8	135.9
Pork	134.8	148.2	155.9	155.2	158.9	157.4	155.5	153.0	152.1	151.5
Poultry	143.5	152.4	156.6	157.9	156.8	155.6	157.4	155.2	155.1	155.3
Fish and seafood	171.6	173.1	177.1	175.3	176.5	178.4	178.9	177.2	180.7	180.9
Eggs	120.5	142.1	140.0	147.7	136.9	135.9	145.1	151.1	143.8	137.3
Dairy Products[2]	132.8	142.1	145.5	146.2	143.5	145.7	147.0	147.8	148.3	147.7
Fats and oils[3]	137.3	140.5	141.7	142.7	142.0	141.7	140.4	140.3	140.5	141.5
Fresh fruits	219.0	234.4	236.3	231.5	243.9	242.6	233.9	239.4	240.2	240.3
Processed fruits	137.1	145.2	148.8	149.8	148.5	148.4	147.8	148.4	--	--
Fresh vegetables	193.1	189.2	194.6	198.6	189.5	192.8	205.2	205.2	233.8	210.5
Potatoes	174.7	180.6	174.2	162.8	191.7	181.6	174.3	175.0	180.2	179.3
Processed vegetables	138.3	143.9	147.2	146.6	146.8	145.9	146.2	145.9	--	--
Cereal and bakery products	167.5	174.0	177.6	176.7	178.1	178.4	178.0	178.4	179.0	179.7
Sugar and sweets	137.5	143.7	147.8	147.2	148.5	148.2	147.4	147.9	150.3	149.6
Nonalcoholic beverages	131.7	128.6	133.4	128.5	136.7	136.6	134.7	133.1	134.1	134.8
Apparel										
Apparel, commodities less footwear	129.3	128.5	129.4	128.6	129.6	131.4	131.4	127.6	--	--
Footwear	125.4	126.6	127.6	126.3	127.4	130.6	129.3	128.2	127.4	126.6
Tobacco and smoking products	225.7	232.8	243.7	237.4	246.5	250.2	250.7	251.2	253.8	261.2
Alcoholic beverages	153.9	158.5	162.8	161.8	163.5	163.7	163.7	164.0	164.6	165.0

-- = Not available. 1. Beef, veal, lamb, pork, and processed meat. 2. Includes butter. 3. Excludes butter. *Information contact: David Johnson (202) 694-5324. For historical data or for categories not listed here, call the Bureau of Labor Statistics' CPI Information Hotline (202) 606-7828*

Table 7—Producer Price Indexes, U.S. Average (not seasonally adjusted)

	Annual			1997					1998	
	1994	1995	1996	Feb	Sep	Oct	Nov	Dec	Jan	Feb
	1982=100									
All commodities	120.4	124.8	127.7	128.5	127.5	127.8	127.8	126.7	125.5	125.1
Finished goods[1]	125.5	127.9	131.3	132.2	131.8	132.3	131.8	131.1	130.2	130.1
All foods[2]	125.2	126.7	132.5	132.2	132.6	133.5	133.3	132.8	130.8	132.0
Consumer foods	126.8	129.0	133.6	133.8	134.7	135.1	134.5	134.2	132.8	133.6
Fresh fruits and melons	82.6	85.7	100.8	111.7	93.4	97.7	87.8	107.3	87.4	92.5
Fresh and dry vegetables	129.1	144.4	135.0	123.3	125.0	148.8	130.0	126.8	143.1	148.7
Dried fruits	121.1	121.2	124.2	124.8	125.7	125.7	125.2	124.8	124.8	124.8
Canned fruits and juices	126.0	129.4	137.5	139.8	136.2	135.8	135.1	134.8	133.0	134.5
Frozen fruits, juices and ades	111.9	115.9	123.9	120.5	114.8	114.2	110.8	110.0	110.0	112.4
Fresh veg. except potatoes	117.8	139.8	120.9	126.2	121.8	143.1	124.7	118.5	133.1	136.6
Canned vegetables and juices	116.3	116.6	121.2	121.1	119.3	120.2	120.3	120.4	121.4	121.7
Frozen vegetables	126.0	124.2	125.4	125.7	125.7	126.6	125.8	125.0	124.9	125.1
Potatoes	142.3	142.6	133.9	79.2	148.3	132.6	117.5	118.3	116.5	113.6
Eggs for fresh use (1991=100)	80.9	86.3	105.1	105.8	100.1	90.1	117.7	109.7	98.3	86.0
Bakery products	160.0	164.3	169.8	173.2	174.3	174.6	174.6	174.6	175.1	175.2
Meats	104.6	102.9	109.0	109.0	112.5	109.8	108.0	106.3	102.3	102.6
Beef and veal	103.6	100.9	100.2	97.9	104.0	103.3	103.9	101.4	100.0	101.1
Pork	101.3	101.4	120.9	122.4	123.5	116.8	111.0	109.8	98.1	97.4
Processed poultry	114.8	114.3	119.8	118.3	118.6	117.0	115.8	114.0	112.6	114.7
Unprocessed and packaged fish	161.5	170.9	165.9	173.1	169.7	187.8	190.0	182.7	190.0	193.6
Dairy products	119.5	119.7	130.4	127.3	127.1	130.4	134.1	134.2	129.9	133.5
Processed fruits and vegetables	121.2	122.4	127.6	127.8	125.3	125.6	124.9	124.7	124.5	125.3
Shortening and cooking oil	138.6	142.5	138.5	136.1	136.6	140.0	144.5	136.9	138.2	141.5
Soft drinks	126.9	133.1	134.0	133.6	132.9	132.9	132.4	132.3	133.1	134.2
Finished consumer goods less foods	121.6	123.9	127.6	129.0	128.6	128.7	128.1	127.2	126.0	125.5
Alcoholic beverages	124.8	128.5	132.8	135.1	134.1	134.0	133.8	134.3	135.1	135.1
Apparel	123.5	124.2	125.1	125.4	125.9	125.9	125.7	125.9	125.7	125.9
Footwear	135.5	139.2	141.6	143.3	144.4	144.2	144.2	144.2	144.6	144.7
Tobacco products	224.7	231.3	237.4	239.2	256.4	256.4	256.0	257.9	257.2	261.9
Intermediate materials[3]	118.5	124.9	125.8	126.1	126.0	125.5	125.6	125.0	124.2	124.0
Materials for food manufacturing	118.5	119.5	125.3	122.9	123.1	122.4	124.4	123.0	119.7	122.1
Flour	110.3	122.8	136.8	122.2	118.0	115.4	115.1	113.3	109.9	111.5
Refined sugar[4]	118.3	119.4	123.7	125.5	122.6	121.4	120.2	119.7	119.1	121.0
Crude vegetable oils	135.0	129.8	118.1	112.8	112.7	118.0	126.2	126.4	125.9	130.8
Crude materials[5]	101.7	102.7	113.8	116.1	108.5	112.7	113.8	107.4	102.7	100.4
Foodstuffs and feedstuffs	106.5	105.8	121.5	111.0	110.6	110.1	110.2	108.8	105.4	105.1
Fruits and vegetables and nuts[6]	104.6	108.4	122.5	122.8	112.8	124.7	111.8	121.4	116.9	122.1
Grains	102.7	112.6	151.1	111.0	107.2	109.1	107.1	107.4	104.4	105.2
Slaughter livestock	96.4	92.8	95.2	93.8	95.8	93.0	93.1	91.4	85.6	83.6
Slaughter poultry, live	124.4	125.6	140.5	130.2	139.9	121.7	122.3	115.9	116.9	116.1
Plant and animal fibers	120.7	155.3	129.4	116.5	118.3	116.8	115.5	108.4	104.1	108.1
Fluid milk	95.8	93.7	107.9	97.8	97.0	101.3	103.0	104.7	105.8	105.9
Oilseeds	117.4	112.6	139.4	137.0	130.2	129.5	134.8	128.3	123.9	126.9
Leaf tobacco	101.2	78.9	89.4	120.8	103.2	105.5	103.5	112.6	110.8	115.2
Raw cane sugar	115.2	119.7	118.6	115.1	118.3	118.1	116.4	116.5	116.5	116.4

-- = Not available. R = Revised. 1. Commodities ready for sale to ultimate consumer. 2. Includes all raw, intermediate, and processed foods (excludes soft drinks, alcoholic beverages, and manufactured animal feeds). 3. Commodities requiring further processing to become finished goods. 4. All types and sizes of refined sugar. 5. Products entering market for the first time that have not been manufactured at that point. 6. Fresh and dried.
Information contact: David Johnson (202) 694-5324. For historical data or for categories not listed here, call the Bureau of Labor Statistics' PPI Information Hotline at (202) 606-7705

Farm-Retail Price Spreads

Table 8—Farm-Retail Price Spreads

	Annual			1996	1997					
	1994	1995	1996	Dec	Jul	Aug	Sep	Oct	Nov	Dec
Market basket[1]										
Retail cost (1982-84=100)	145.4	149.4	155.9	160.0	159.0	159.8	160.0	160.4	160.6	161.0
Farm value (1982-84=100)	101.4	102.7	110.8	111.8	105.2	106.5	105.2	103.6	106.8	105.5
Farm-retail spread (1982-84=100)	169.0	174.6	180.3	186.0	187.9	188.5	189.6	190.9	189.6	191.0
Farm value-retail cost (%)	24.4	24.1	24.9	24.5	23.2	23.3	23.0	22.6	23.3	22.9
Meat products										
Retail cost (1982-84=100)	135.4	135.5	140.1	144.4	144.6	145.5	145.6	145.2	144.7	143.4
Farm value (1982-84=100)	96.1	93.8	100.4	106.9	103.9	104.1	100.5	97.8	97.0	94.8
Farm-retail spread (1982-84=100)	175.7	178.2	180.9	182.8	186.4	188.0	191.9	193.8	193.6	193.3
Farm value-retail cost (%)	35.9	35.1	36.3	37.5	36.4	36.2	34.9	34.1	34.0	33.5
Dairy products										
Retail cost (1982-84=100)	131.7	132.8	142.1	148.6	143.3	143.4	143.5	145.7	147.0	147.8
Farm value (1982-84=100)	94.5	92.2	107.2	106.1	93.0	91.7	94.0	100.6	105.3	104.0
Farm-retail spread (1982-84=100)	166.1	170.3	174.3	187.8	189.7	191.1	189.2	187.3	185.5	188.2
Farm value-retail cost (%)	34.4	33.3	36.2	34.3	31.1	30.7	31.4	33.1	34.3	33.8
Poultry										
Retail cost (1982-84=100)	141.5	143.5	152.4	157.8	157.9	155.6	156.8	155.6	157.4	155.2
Farm value (1982-84=100)	114.6	113.7	126.2	133.9	128.6	128.4	124.2	114.4	113.4	105.7
Farm-retail spread (1982-84=100)	172.6	177.7	182.6	185.4	191.7	186.9	194.3	203.1	208.0	212.2
Farm value-retail cost (%)	43.3	42.4	44.3	45.4	43.6	44.2	42.4	39.3	38.6	36.4
Eggs										
Retail cost (1982-84=100)	114.3	120.5	142.1	162.9	132.9	137.7	136.9	135.9	145.1	151.1
Farm value (1982-84=100)	83.5	91.1	114.7	137.5	90.2	85.6	99.0	91.4	121.9	116.9
Farm-retail spread (1982-84=100)	169.4	173.2	191.4	208.5	209.6	231.3	205.0	215.8	186.9	212.6
Farm value-retail cost (%)	47.0	48.6	51.9	54.2	43.6	39.9	46.5	43.2	54.0	49.7
Cereal and bakery products										
Retail cost (1982-84=100)	164.2	167.5	174.0	175.7	178.3	178.6	178.1	178.4	178.0	178.4
Farm value (1982-84=100)	102.6	102.6	102.6	109.1	100.6	104.1	106.3	103.8	102.7	103.8
Farm-retail spread (1982-84=100)	171.5	176.5	183.9	185.0	189.1	189.0	188.1	188.8	188.5	188.8
Farm value-retail cost (%)	7.7	7.5	7.2	7.6	6.9	7.1	7.3	7.1	7.1	7.1
Fresh fruit										
Retail cost (1982-84=100)	208.8	226.9	243.0	262.6	237.8	246.6	255.6	254.0	243.3	250.1
Farm value (1982-84=100)	119.4	136.2	151.7	140.6	121.9	139.0	147.2	137.1	140.6	159.0
Farm-retail spread (1982-84=100)	250.1	268.7	285.2	318.9	291.3	296.3	305.6	307.9	290.7	292.1
Farm value-retail cost (%)	18.1	19.0	19.7	16.9	16.2	17.8	18.2	17.1	18.3	20.1
Fresh vegetables										
Retail cost (1982-84=100)	172.3	193.1	189.2	181.2	190.3	192.3	189.5	192.8	205.2	205.2
Farm value (1982-84=100)	121.1	130.1	113.3	94.8	118.9	135.2	117.7	113.0	131.2	122.7
Farm-retail spread (1982-84=100)	198.6	225.5	228.3	225.6	227.0	221.7	226.4	233.8	243.2	247.6
Farm value-retail cost (%)	23.9	22.9	20.3	17.8	21.2	23.9	21.1	19.9	21.7	20.3
Processed fruits and vegetables										
Retail cost (1982-84=100)	134.5	137.5	144.4	146.2	148.8	148.7	147.6	147.2	146.9	147.2
Farm value (1982-84=100)	112.5	119.2	117.2	119.5	115.8	115.0	114.6	113.1	115.0	115.1
Farm-retail spread (1982-84=100)	141.3	143.2	152.9	154.5	159.1	159.2	157.9	157.5	156.8	157.2
Farm value-retail cost (%)	19.9	20.6	19.3	19.4	18.5	18.4	18.5	18.4	18.6	18.6
Fats and oils										
Retail cost (1982-84=100)	133.5	137.3	140.5	140.7	141.4	141.4	142.0	141.7	140.4	140.3
Farm value (1982-84=100)	125.5	121.3	112.3	104.0	105.2	104.8	105.7	113.0	117.9	114.3
Farm-retail spread (1982-84=100)	136.5	143.1	150.9	154.2	154.7	154.9	155.4	152.3	148.7	149.9
Farm value-retail cost (%)	25.3	23.8	21.5	19.9	20.0	19.9	20.0	21.4	22.6	21.9

See footnotes at end of table, next page.

Table 8—Farm-Retail Price Spreads (continued)

| | Annual | | | 1997 | | | | | 1998 | |
	1995	1996	1997	Feb	Sep	Oct	Nov	Dec	Jan	Feb
Beef, all fresh retail price (cts/lb)	259.4	252.4	253.8	254.8	254.3	254.0	253.4	254.8	253.1	251.3
Beef, choice										
Retail price (cents/lb.)[2]	284.4	280.2	279.5	278.6	283.0	279.0	278.0	280.9	275.3	272.0
Wholesale value (cents)[3]	163.9	158.1	158.2	151.5	159.4	158.7	160.2	155.6	154.2	148.5
Net farm value (cents)[4]	138.4	134.9	137.2	132.9	137.8	138.2	139.5	136.5	135.8	128.0
Farm-retail spread (cents)	146.0	145.3	142.3	145.7	145.2	140.8	138.5	144.4	139.5	144.0
Wholesale-retail (cents)[5]	120.5	122.1	121.3	127.1	123.6	120.3	117.8	125.3	121.1	123.5
Farm-wholesale (cents)[6]	25.5	23.2	21.0	18.6	21.6	20.5	20.7	19.1	18.4	20.5
Farm value-retail price (%)	49.0	48.0	49.0	48.0	49.0	50.0	50.0	49.0	49.0	47.0
Pork										
Retail price (cents/lb.)[2]	194.8	220.9	231.5	231.3	234.7	234.9	231.3	226.8	234.8	234.5
Wholesale value (cents)[3]	98.8	117.2	117.1	117.6	117.4	110.5	107.9	101.5	96.2	94.0
Net farm value (cents)[4]	66.7	84.6	81.1	81.3	78.3	73.2	69.9	62.1	57.4	54.6
Farm-retail spread (cents)	128.1	136.3	150.4	150.0	156.4	161.7	161.4	164.7	177.4	179.9
Wholesale-retail (cents)[5]	96.0	103.7	114.4	113.7	117.3	124.4	123.4	125.3	138.6	140.5
Farm-wholesale (cents)[6]	32.1	32.6	36.0	36.3	39.1	37.3	38.0	39.4	38.8	39.4
Farm value-retail price (%)	34.0	38.0	35.0	35.0	33.0	31.0	30.0	27.0	24.0	23.0

1. Retail costs are based on CPI-U of retail prices for domestically produced farm foods, published monthly by the Bureau of Labor Statistics (BLS). Farm value is the payment for the quantity of farm equivalent to the retail unit, less allowance for by-product. Farm values are based on prices at first point of sale, and may include marketing charges such as grading and packing for some commodities. The farm-retail spread, the difference between the retail price and farm value, represents charges for assembling, processing, transporting, distributing. 2. Weighted-average price of retail cuts from pork and choice yield grade 3 beef. Prices from BLS. 3. Value of wholesale (boxed beef) and wholesale cuts (pork) equivalent to 1 lb. of retail cuts adjusted for transportation costs and by-product values. 4. Market value to producer for live animal equivalent to 1 lb. of retail cuts, minus value of by-products. 5. Charges for retailing and other marketing services such as wholesaling, and in-city transportation. 6. Charges for livestock marketing, processing, and transportation. *Information contacts: Veronica Jones (202) 694-5387, Larry Duewer (202) 694-5172*

Table 9—Price Indexes of Food Marketing Costs

| | Annual | | | 1996 | | | 1997 | | | |
	1994	1995	1996	II	III	IV	I	II	III	IV
					*1987=100**					
Labor—hourly earnings										
and benefits	455.2	459.7	474.3	458.5	459.1	465.3	469.3	473.0	474.6	480.2
Processing	472.5	474.7	486.0	474.6	474.7	480.2	481.4	484.9	487.1	490.5
Wholesaling	502.2	516.0	536.2	514.4	518.3	520.5	526.2	534.1	538.9	545.4
Retailing	417.1	419.9	435.2	417.7	417.3	426.1	432.1	434.1	433.6	441.1
Packaging and containers	415.7	399.8	390.3	400.0	397.0	393.1	392.1	388.7	387.6	392.9
Paperboard boxes and containers	392.1	363.8	341.9	366.1	352.1	348.9	347.2	335.4	334.7	350.3
Metal cans	504.9	498.3	491.0	501.9	502.8	481.8	489.4	496.1	490.8	487.9
Paper bags and related products	457.8	437.8	441.9	434.2	438.2	443.3	443.8	441.6	439.5	442.5
Plastic films and bottles	330.6	326.5	326.6	321.9	328.9	331.9	326.6	325.3	326.9	327.5
Glass containers	463.3	460.5	447.4	460.0	460.3	459.3	449.3	446.9	446.6	446.6
Metal foil	263.1	235.7	233.4	239.9	230.8	229.9	228.2	232.0	237.2	236.4
Transportation services	436.6	429.8	430.0	425.0	428.8	430.2	431.0	430.6	429.0	429.4
Advertising	539.1	580.1	609.4	579.2	580.6	582.8	608.1	608.7	609.3	611.6
Fuel and power	633.7	670.7	668.5	670.3	678.0	699.2	689.5	657.4	658.1	669.0
Electric	511.3	501.3	499.2	503.8	521.0	492.6	488.5	499.0	517.7	491.5
Petroleum	559.7	666.8	616.7	669.3	658.9	745.5	672.8	609.7	574.8	609.6
Natural gas	1,091.7	1,136.7	1,214.0	1,123.6	1,136.7	1,180.9	1,261.1	1,165.7	1,179.7	1,249.4
Communications, water and sewage	284.9	296.8	302.8	297.5	299.1	299.1	301.1	302.2	303.5	304.2
Rent	269.0	268.2	265.6	268.1	268.6	268.3	266.6	265.6	265.1	265.1
Maintenance and repair	486.1	499.6	514.9	497.2	501.4	506.2	509.6	513.0	517.3	519.7
Business services	491.0	501.7	512.3	500.1	503.3	506.6	509.5	511.7	513.9	514.1
Supplies	342.7	338.3	337.8	339.2	338.2	339.0	338.8	337.0	337.5	337.9
Property taxes and insurance	546.8	564.3	580.1	561.8	566.5	570.4	573.6	577.3	582.2	587.3
Interest, short-term	113.5	103.9	108.9	106.8	107.5	104.2	105.3	111.2	108.8	110.1
Total marketing cost index	444.8	452.1	459.9	450.9	451.9	455.6	458.6	458.4	459.1	463.4

Last two quarters preliminary. * Indexes measure changes in employee earnings and benefits and in prices of supplies used in processing, wholesaling, and retailing U.S. farm foods purchased for at-home consumption. *Information contact: Veronica Jones (202) 694-5387*

Livestock & Products

Table 10—U.S. Meat Supply & Use

	Beg. stocks	Produc-tion[1]	Imports	Total supply	Exports	Ending stocks	Consumption Total	Per capita[2]	Conversion factor[3]	Primary market price[4]
				Million lbs. [5]				*Lbs.*		*$/cwt*
Beef										
1994	529	24,386	2,369	27,284	1,611	548	25,125	67	0.695	69
1995	548	25,222	2,103	27,873	1,821	519	25,533	68	0.695	66
1996	519	25,525	2,073	28,117	1,877	377	25,863	68	0.700	65
1997	377	25,490	2,343	28,210	2,136	465	25,609	67	0.700	66
1998	465	25,431	2,700	28,596	2,085	350	26,161	68	0.700	64-68
Pork										
1994	359	17,696	743	18,798	549	438	17,811	53	0.776	40
1995	438	17,849	664	18,951	787	396	17,768	52	0.776	42
1996	396	17,117	618	18,131	970	366	16,795	49	0.776	53
1997	366	17,274	633	18,273	1,044	408	16,821	49	0.776	51
1998	408	18,980	575	19,963	990	470	18,503	53	0.776	36-38
Veal[6]										
1994	4	293	0	297	0	7	290	1	0.83	87
1995	7	319	0	326	0	7	319	1	0.83	75
1996	7	378	0	385	0	7	378	1	0.83	59
1997	7	334	0	341	0	8	333	1	0.83	82
1998	8	272	0	280	0	6	274	1	0.83	86
Lamb and mutton										
1994	8	308	49	365	9	11	345	1	0.89	67
1995	11	287	64	362	6	8	348	1	0.89	76
1996	8	268	73	349	6	9	334	1	0.89	85
1997	9	261	83	350	5	14	330	1	0.89	88
1998	14	243	90	341	8	11	322	1	0.89	74
Total red meat										
1994	900	42,683	3,161	46,744	2,169	1,004	43,571	122	--	--
1995	1,004	43,677	2,831	47,512	2,614	930	43,968	122	--	--
1996	930	43,288	2,764	46,982	2,853	759	43,370	120	--	--
1997	759	43,358	3,059	47,176	3,185	895	43,096	118	--	--
1998	895	44,922	3,365	49,182	3,083	837	45,262	123	--	--
										¢/lb
Broilers										
1994	358	23,666	1	24,025	2,876	458	20,690	70	0.875	56
1995	458	24,827	1	25,287	3,894	560	20,832	69	0.869	56
1996	560	26,124	4	26,688	4,420	641	21,626	71	0.869	61
1997	641	27,027	5	27,673	4,664	607	22,402	73	0.869	59
1998	607	28,159	3	28,769	4,750	650	23,369	75	0.869	55-58
Mature chickens										
1994	8	509	0	517	90	14	413	2	1.0	--
1995	14	496	3	513	99	7	406	2	1.0	--
1996	7	491	0	498	265	6	228	1	1.0	--
1997	6	509	0	515	384	7	124	1	1.0	--
1998	7	525	0	532	390	5	137	1	1.0	--
Turkeys										
1994	249	4,937	0	5,187	280	254	4,652	18	1.0	66
1995	254	5,069	2	5,326	348	271	4,706	18	1.0	66
1996	271	5,401	1	5,673	438	328	4,906	19	1.0	66
1997	328	5,412	1	5,741	598	415	4,728	18	1.0	65
1998	415	5,345	1	5,761	610	425	4,725	18	1.0	59-63
Total poultry										
1994	615	29,113	1	29,728	3,246	727	25,754	89	--	--
1995	727	30,393	6	31,125	4,342	839	25,944	88	--	--
1996	839	32,015	5	32,859	5,123	975	26,760	90	--	--
1997	975	32,948	6	33,929	5,646	1,029	27,253	91	--	--
1998	1,029	34,029	4	35,062	5,750	1,080	28,231	93	--	--
Red meat and poultry										
1994	1,515	71,796	3,162	76,472	5,415	1,731	69,326	211	--	--
1995	1,731	74,070	2,837	78,637	6,956	1,769	69,912	210	--	--
1996	1,769	75,303	2,769	79,841	7,976	1,734	70,130	210	--	--
1997	1,734	76,306	3,065	81,105	8,831	1,924	70,349	208	--	--
1998	1,924	78,951	3,369	84,244	8,833	1,917	73,493	216	--	--

-- = Not available. Values for the last year are forecasts. 1. Total including farm production for red meat and federally inspected plus nonfederally inspected for poultry. 2. Retail-weight basis. 3. Red meat, Carcass to retail conversion; poultry, ready-to-cook production to retail weight. 4. Dollars per cwt. for red meat; cents per pound for poultry. Beef: Medium #1, Nebraska Direct 1,100-1,300 lb.; pork: barrows and gilts, Iowa, Southern Minnesota; veal: farm price of calves; lamb and mutton: choice slaughter lambs, San Angelo; broilers: wholesale 12-city average; turkeys: wholesale NY 8-16 lb. young hens. 5. Carcass weight for red meats and certified ready-to-cook for poultry. 6. Beginning in 1989, veal trade is no longer reported separately. *Information contact: LaVerne Williams (202) 694-5190*

Table 11—U.S. Egg Supply & Use

	Beg. stocks	Production	Imports	Total supply	Exports	Hatching use	Ending stocks	Consumption Total	Per capita	Primary market price*
				Million doz.					*No.*	*Cts./doz.*
1991	11.6	5,800.6	2.3	5,814.5	154.5	708.6	13.0	4,938.5	234.6	77.5
1992	13.0	5,905.0	4.3	5,922.3	157.0	732.0	13.5	5,019.8	235.9	65.4
1993	13.5	6,005.8	4.7	6,023.9	158.9	769.6	10.7	5,084.6	236.4	72.5
1994	10.7	6,177.6	3.7	6,192.0	187.6	805.4	14.9	5,184.1	238.7	67.3
1995	14.9	6,215.6	4.1	6,234.6	208.9	847.2	11.2	5,167.3	235.7	72.9
1996	11.2	6,371.3	5.4	6,387.9	253.1	864.7	8.5	5,261.5	237.8	88.2
1997	8.5	6,459.8	6.9	6,475.6	227.8	891.8	7.4	5,348.3	239.5	81.2
1998	7.4	6,625.0	4.0	6,636.4	235.0	930.0	10.0	5,461.4	242.4	76.6

Values for the last year are forecasts. Values for previous year are preliminary. * Cartoned grade A large eggs, New York. *Information contact*:
LaVerne Williams (202) 694-5190

Table 12—U.S. Milk Supply & Use[1]

	Production	Farm use	Commercial Farm Market-ings	Beg. stocks	Imports	Total commer-cial supply	CCC net re-movals	Commercial Ending stocks	Disap-pear-ance	All milk price[1]	CCC net removals Skim solids basis	Total solid basis[2]
				Billion lbs. (milkfat basis)						*$/cwt*	*Billion lbs.*	
1990	147.7	2.0	145.7	4.1	2.7	152.5	9.0	5.1	138.3	13.68	1.6	4.6
1991	147.7	2.0	145.7	5.1	2.6	153.4	10.4	4.5	138.6	12.24	3.9	6.5
1992	150.9	1.9	149.0	4.5	2.5	155.9	9.9	4.7	141.3	13.09	2.0	5.2
1993	150.6	1.8	148.8	4.7	2.8	156.2	6.7	4.6	145.0	12.80	3.9	5.0
1994	153.7	1.7	152.0	4.6	2.9	159.4	4.8	4.3	150.3	12.97	3.7	4.2
1995	155.4	1.6	153.9	4.3	2.9	161.1	2.1	4.1	154.9	12.74	4.4	3.5
1996	154.3	1.5	153.8	4.1	2.9	159.8	0.1	4.7	155.0	14.74	0.7	0.5
1997	156.6	1.4	155.2	4.7	2.7	162.6	1.3	4.9	156.5	13.38	3.6	2.7
1998	157.2	1.3	156.0	4.9	3.2	164.1	0.7	4.9	158.5	13.70	2.3	1.6

Values for last year are forecasts, values for the previous year preliminary. 1. Delivered to plants and dealers; does not reflect deductions. 2. Arbitrarily
weighted average of milkfat basis (40 percent) and solids basis (60 percent). *Information contact: Jim Miller (202) 694-5184*

Table 13—Poultry & Eggs

	Annual 1995	1996	1997	1997 Jan	Aug	Sep	Oct	Nov	Dec	1998 Jan
Broilers										
Federally inspected slaughter certified (mil. lb.)	25,020.8	26,336.3	27,196.3	2,370.2	2,276.8	2,281.1	2,496.8	2,009.8	2,301.7	2,346.6
Wholesale price, 12-city (cents/lb.)	56.2	61.2	58.8	62.0	63.2	59.9	55.4	54.6	52.2	54.7
Price of grower feed ($/ton)[1]	135.1	175.5	157.8	155.0	154.0	145.0	143.0	149.0	146.0	147.0
Broiler-feed price ratio[2]	5.1	4.4	4.7	5.2	5.2	5.3	4.9	4.6	4.4	4.5
Stocks beginning of period (mil. lb.)	458.4	560.1	641.3	641.3	655.8	559.0	545.6	579.3	604.0	606.8
Broiler-type chicks hatched (mil.)[3]	7,932.4	8,076.9	8,306.5	700.5	709.3	683.2	683.1	648.1	711.6	710.6
Turkeys										
Federally inspected slaughter certified (mil. lb.)	5,128.8	5,465.6	5,477.9	442.1	456.3	462.6	513.7	453.5	460.4	431.7
Wholesale price, Eastern U.S. 8-16 lb. young hens (cents/lb.)	66.4	66.5	64.9	59.7	68.1	67.9	67.3	70.1	62.2	55.6
Price of turkey grower feed ($/ton)[1]	130.1	166.1	142.5	143.0	138.0	135.0	132.0	134.0	133.0	131.0
Turkey-feed price ratio[2]	6.3	5.3	5.6	5.4	5.9	6.1	6.1	6.3	5.8	5.4
Stocks beginning of period (mil. lb.)	254.4	271.3	328.0	328.0	714.3	742.0	770.7	736.6	438.6	415.1
Poults placed in U.S. (mil.)[3]	321.7	327.2	321.5	27.1	26.3	23.9	24.6	23.3	25.7	26.2
Eggs										
Farm production (mil.)	74,587	76,456	77,515	6,574	6,483	6,350	6,646	6,549	6,814	6,737
Average number of layers (mil.)	294	298	303	304	300	303	306	309	311	310
Rate of lay (eggs per layer on farms)	253.8	256.2	255.2	22.0	21.6	21.0	21.7	21.2	21.9	21.7
Cartoned price, New York, grade A large (cents/doz.)[4]	72.9	88.2	81.2	86.3	74.7	82.4	77.0	97.4	90.3	83.2
Price of laying feed ($/ton)[1]	149.7	184.4	159.8	152.0	163.0	150.0	151.0	141.0	143.0	124.0
Egg-feed price ratio[2]	8.6	8.5	8.8	10.0	7.8	9.3	8.7	11.4	11.0	11.9
Stocks, first of month Frozen (mil. doz.)	14.8	10.5	7.7	8.5	6.7	8.4	8.3	8.3	7.8	7.4
Replacement chicks hatched (mil.)	397	407	422	33.3	32.9	35.8	35.2	27.8	35.6	37.2

1. Calculated from price ratios that were revised February 1995. 2. Pounds of feed equal in value to 1 dozen eggs or 1 lb. of broiler or turkey liveweight.
(Revised February 1995). 3. Placement of broiler chicks is currently reported for 15 States only; henceforth, hatch of broiler-type chicks will be used as
a substitute. 4. Price of cartoned eggs to volume buyers for delivery to retailers. *Information contact: LaVerne Williams (202) 694-5190*

Table 14—Dairy

	1995	1996	1997	1997 Jan	Aug	Sep	Oct	Nov	Dec	1998 Jan
Milk--Basic Formula Price ($/cwt)[1]	11.83	13.39	12.05	11.94	12.07	12.79	12.83	12.96	13.29	13.25
Wholesale prices										
Butter, grade A Chi. (cents/lb.)	75.6	100.3	107.1	81.9	102.5	101.6	135.3	148.8	120.1	109.2
Am. cheese, Wis. assembly pt. (cents/lb.)	132.8	149.1	132.4	127.9	137.6	141.4	142.4	143.8	146.1	144.5
Nonfat dry milk (cents/lb.)[2]	108.6	122.2	110.0	113.9	107.2	107.1	106.9	107.1	107.4	105.9
USDA net removals										
Total (mil. lb.)[2]	2,106.1	86.9	1,277.6	29.2	122.4	129.4	141.2	183.0	183.4	129.7
Butter (mil. lb.)	78.5	0.1	47.0	0.8	4.6	5.1	5.3	7.1	7.1	4.3
Am. cheese (mil. lb.)	6.1	4.6	11.3	0.5	0.6	0.4	1.2	0.8	0.5	0.7
Nonfat dry milk (Mil. lb.)	343.8	57.2	296.7	9.2	35.1	34.7	24.9	31.9	31.7	37.6
Milk										
Milk prod. 20 States (mil. lb.)	131,780	131,343	133,861	11,158	11,213	10,671	10,977	10,591	11,118	11,316
Milk per cow (lb.)	16,762	16,800	17,252	1,433	1,446	1,377	1,416	1,369	1,438	1,464
Number of milk cows (1,000)	7,862	7,818	7,759	7,787	7,757	7,752	7,750	7,737	7,732	7,730
U.S. milk production (mil. lb.)[4]	155,424	154,259	156,603	13,131	13,058	12,423	12,818	12,363	12,973	13,257
Stocks, beginning[3]										
Total (mil. lb.)	5,760	4,168	4,714	4,714	7,385	6,846	5,933	5,215	4,696	4,887
Commercial (mil. lb.)	4,263	4,099	4,704	4,704	7,354	6,814	5,914	5,199	4,677	4,869
Government (mil. lb.)	1,497	69	10	10	31	32	19	16	19	18
Imports, total (mil. lb.)[3]	2,936	2,911	2,698	172	228	228	265	275	342	--
Commercial disappearance (mil. lb.)[3]	154,843	154,985	156,487	12,819	13,587	13,309	13,540	12,864	12,826	--
Butter										
Production (mil. lb.)	1,264.5	1,174.5	1,148.0	124.0	70.3	79.7	83.1	88.7	105.7	113.5
Stocks, beginning (mil. lb.)	79.4	18.6	13.7	13.7	85.6	69.5	43.9	26.6	15.4	20.8
Commercial disappearance (mil. lb.)	1,186.3	1,179.8	1,097.0	115.2	81.8	100.2	95.0	92.9	93.5	--
American cheese										
Production (mil. lb.)	3,131.4	3,280.8	3,283.0	278.9	258.7	260.6	260.1	251.6	277.3	283.2
Stocks, beginning (mil. lb.)	310.4	307.0	379.9	379.9	470.6	461.0	434.3	415.1	405.9	410.8
Commercial disappearance (mil. lb.)	3,148.5	3,230.1	3,266.4	275.4	270.8	287.3	279.7	262.9	274.7	--
Other cheese										
Production (mil. lb.)	3,785.5	3,936.7	4,068.6	317.2	342.3	345.1	359.5	350.6	352.0	332.8
Stocks, beginning (mil. lb.)	126.8	105.3	107.3	107.3	135.9	122.8	109.6	90.2	68.9	70.0
Commercial disappearance (mil. lb.)	4,125.6	4,243.0	4,390.3	321.4	379.3	383.5	408.5	400.7	387.6	--
Nonfat dry milk										
Production (mil. lb.)	1,233.0	1,061.8	1,208.1	97.3	90.8	77.3	72.5	74.6	102.2	103.6
Stocks, beginning (mil. lb.)	131.2	85.0	71.4	71.4	163.8	161.8	141.9	124.9	116.8	124.9
Commercial disappearance (mil. lb.)	923.7	1,009.0	885.4	84.6	60.5	65.6	71.0	59.2	64.7	--
Frozen dessert										
Production (mil. gal.)[5]	1,229.6	1,240.9	1,230.8	85.2	112.8	99.8	97.0	78.4	78.6	82.7

	Annual			1996			1997			
	1995	1996	1997	II	III	IV	I	II	III	IV
Milk production (mil. lb.)	155,424	154,259	156,603	39,626	37,642	37,946	38,961	40,683	38,805	38,154
Milk per cow (lb.)	16,433	16,479	16,916	4,226	4,026	4,071	4,192	4,384	4,195	4,145
No. of milk cows (1,000)	9,458	9,361	9,258	9,376	9,349	9,320	9,295	9,280	9,251	9,205
Milk-feed price ratio	1.63	1.60	1.54	1.51	1.64	1.67	1.53	1.48	1.47	1.70
Returns over concentrate costs ($/cwt milk)	9.50	10.98	9.80	10.40	11.95	11.55	9.80	9.30	9.10	10.90

-- = Not available. Quarterly values for last year are preliminary. 1. Manufacturing grade milk. 2. Prices paid f.o.b. Central States production area.
3. Milk equivalent, fat basis. 4. Monthly data ERS estimates. 5. Hard ice cream, ice milk, and hard sherbet.
Information contact: LaVerne Williams (202) 694-5190

Table 15—Wool

	Annual			1996			1997			
	1995	1996	1997	II	III	IV	I	II	III	IV
U.S. wool price (cents/lb.)[1]	258	193	238	192	192	191	196	244	255	258
Imported wool price (cents/lb.)[2]	249	196	206	197	192	191	196	210	213	204
U.S. mill consumption, scoured										
Apparel wool (1,000 lb.)	129,299	110,986	108,359	30,816	23,472	23,092	27,461	28,158	25,509	27,231
Carpet wool (1,000 lb.)	12,667	12,311	13,508	2,660	3,393	3,111	3,417	3,324	3,371	3,396

1. Wool price delivered at U.S. mills, clean basis, Graded Territory 64's (20.60-22.04 microns) staple 2-3/4" and up. 2. Wool price,
Charleston, SC warehouse, clean basis, Australian 60/62's, type 64A (24 micron). Duty since 1982 has been 10 cents. *Information contacts*:
Mae Dean Johnson (202) 694-5299

Table 16—Meat Animals

	Annual			1997					1998	
	1995	1996	1997	Feb	Sep	Oct	Nov	Dec	Jan	Feb
Cattle on feed (7 States, 1000+ head capacity)										
Number on feed (1,000 head)[1]	8,031	8,667	8,943	8,813	7,850	8,558	9,390	9,003	9,455	9,180
Placed on feed (1,000 head)	20,034	19,564	20,765	1,552	2,278	2,454	1,826	1,423	1,492	1,250
Marketings (1,000 head)	18,753	18,636	19,552	1,554	1,528	1,545	1,429	1,415	1,689	1,539
Other disappearance (1,000 head)	674	652	701	42	42	77	69	68	78	56
Market prices ($/cwt)										
Slaughter cattle										
Choice steers, 1,100-1,300 lb.										
Texas	66.69	65.06	65.99	65.35	66.04	66.93	67.66	65.91	64.57	60.77
Neb. direct	66.26	65.05	66.32	65.48	66.22	67.08	67.21	65.53	63.57	59.74
Boning utility cows, Sioux Falls	35.58	30.33	34.27	32.50	32.41	31.71	32.20	34.50	38.14	38.5
Feeder steers										
Medium no. 1, Oklahoma City										
600-650 lb.	70.49	61.31	81.34	74.02	88.02	79.55	80.62	83.28	81.54	83.14
750-800 lb.	68.03	61.08	76.19	69.46	78.57	76.84	79.11	81.00	77.23	75.28
Slaughter hogs										
Barrows and gilts, 230-250 lb.										
Iowa, S. Minn.	42.35	53.39	51.36	51.44	49.99	46.62	44.54	39.85	35.6	34.53
6 markets	41.99	53.42	51.30	51.49	49.42	46.17	44.40	40.50	35.82	34.11
Slaughter sheep and lambs										
Lambs, Choice, San Angelo	75.86	85.27	87.95	100.81	85.45	82.75	80.33	83.52	74.38	74.31
Ewes, Good, San Angelo	33.91	39.05	49.33	52.38	44.20	45.44	49.67	48.42	49.75	50.69
Feeder lambs										
Choice, San Angelo	81.08	94.88	104.43	115.44	98.10	96.31	94.00	97.17	95.31	92
Wholesale meat prices, Midwest										
Boxed beef cut-out value										
Choice, 700-800 lb.	106.09	102.01	102.75	98.17	102.58	102.86	103.74	100.43	99.16	94.57
Select, 700-800 lb.	98.45	95.34	96.15	94.55	94.62	93.27	94.66	93.39	96.76	92.77
Canner and cutter cow beef	68.67	58.18	64.50	59.73	63.89	59.76	59.67	62.13	62	65.64
Pork cutout, No. 2	59.98	72.39	72.06	70.00	70.84	66.12	65.49	57.76	51.75	52.07
Pork loins, 14-18 lb.	107.74	118.49	111.57	109.50	112.07	99.68	85.99	79.44	76.5	77.68
Pork bellies, 12-14 lb.	43.04	69.97	73.58	68.42	72.25	57.97	54.50	47.52	43	41.81
Hams, skinned, 20-26 lb.	55.95	68.48	63.38	64.30	62.70	59.89	65.64	55.66	45.75	45.04
All fresh beef retail price	259.42	252.44	253.72	254.79	254.34	254.02	253.35	254.77	253.14	251.31
Commercial slaughter (1,000 head)[2]										
Cattle	35639	36583	36351	2795	2968	3224	2760	2877	3040	2747
Steers	18274	17819	17554	1316	1433	1444	1259	1345	1450	1346
Heifers	10399	10756	11538	913	952	1092	864	873	974	894
Cows	6281	7274	6563	518	522	624	584	609	568	462
Bull and stags	686	728	696	49	61	64	53	50	48	45
Calves	1430	1768	1574	126	136	141	122	145	128	113
Sheep and lambs	4560	4184	3911	327	323	335	314	349	310	309
Hogs	96326	92394	91566	6972	8020	8780	7748	8624	8588	7711
Barrows and gilts	91683	88224	88253	6693	7715	8115	7433	8289	8271	7417
Commercial production (mil. lb.)										
Beef	25117	25421	25384	1919	2126	2300	1934	2024	2157	1977
Veal	307	368	323	27	28	28	24	26	24	21
Lamb and mutton	284	265	257	21	21	22	20	23	21	21
Pork	17810	17084	17245	1309	1490	1652	1473	1641	1634	1457

	Annual			1996		1997				1998
	1995	1996	1997	III	IV	I	II	III	IV	I
Hogs and pigs (U.S.)[3]										
Inventory (1,000 head)[1]	59,990	58,264	56,141	57,200	58,200	56,171	55,900	58,150	60,384	59,920
Breeding (1,000 head)[1]	7,060	6,839	6,667	6,870	6,770	6,655	6,800	6,950	6,943	6,979
Market (1,000 head)[1]	52,930	51,425	49,474	50,330	51,430	49,516	49,100	51,200	53,441	52,941
Farrowings (1,000 head)	11,847	11,187	11,440	2,761	2,717	2,677	2,952	2,899	2,931	2,914
Pig crop (1,000 head)	98,516	94,956	98,972	23,667	23,159	22,990	25,460	25,220	25,302	--
Cattle on Feed, 7 states (1,000 head)[4]										
Steers and Steer Calves	5,218	5,588	5410	4,177	4,656	5,410	5,417	4,615	5,147	5803
Heifers and Heifer Calves	2,785	3,005	3455	2,364	2,798	3,455	3,431	3,026	3,383	3615
Cows and Bulls	30	74	78	37	32	78	56	38	28	37

-- = Not available. 1. Beginning of period. 2. Classes estimated. 3. Quarters are Dec. of preceding year to Feb. (1), Mar.-May (II), June-Aug. (III), and Sept.-Nov. (IV). 4. Beginning of period. The 7 States include AZ, CA, CO, IA, KS, NE, and TX. *Information contact: Leland Southard (202) 501-8553*

Crops & Products

Table 17—Supply & Utilization[1,2]

	Set aside[3]	Area Planted	Harvested	Yield	Production	Total Supply[4]	Feed & residual	Other domestic use	Exports	Total Use	Ending stocks	Farm price[5]
		Mil. Acres		*Bu./acre*				*Mil. bu.*				*$/bu.*
Wheat												
1993/94	5.7	72.2	62.7	38.2	2,396	3,036	272	968	1,228	2,467	568	3.26
1994/95	5.2	70.3	61.8	37.6	2,321	2,981	344	942	1,188	2,475	507	3.45
1995/96*	6.1	69.1	60.9	35.8	2,183	2,757	153	987	1,241	2,381	376	4.55
1996/97*	--	75.6	62.9	36.3	2,285	2,753	314	995	1,001	2,310	444	4.30
1997/98*	--	71.0	63.6	39.7	2,527	3,060	300	1,011	1,075	2,386	674	3.40-3.50
		Mil. acres		*lb./acre*				*Mil. cwt (rough equiv)*				*$/cwt*
Rice[6]												
1993/94	0.7	2.9	2.8	5,510.4	156.1	202.5	--	6/ 101.4	75.3	176.7	25.8	8.0
1994/95	0.3	3.4	3.3	5,964.4	197.8	230.9	--	6/ 100.7	98.9	199.6	31.3	6.8
1995/96*	0.5	3.1	3.1	5,621.4	173.9	212.6	--	6/ 104.6	83.0	187.6	25.0	9.2
1996/97*	--	2.8	2.8	6,120.8	171.3	206.3	--	6/ 100.7	78.4	179.1	27.2	10.0
1997/98*	--	3.1	3.0	5,896.4	178.9	215.1	--	6/ 107.9	81.0	188.9	26.2	9.50-9.80
		Mil. acres		*Bu./acre*				*Mil. bu.*				*$/bu.*
Corn												
1993/94	10.9	73.2	62.9	100.7	6,336	8,470	4,683	1,609	1,328	7,620	850	2.5
1994/95	2.4	79.2	72.9	138.6	10,103	10,962	5,523	1,704	2,177	9,405	1,558	2.3
1995/96*	7.7	71.2	65.0	113.5	7,374	8,948	4,682	1,612	2,228	8,522	426	3.2
1996/97*	--	79.5	73.1	127.1	9,293	9,733	5,362	1,692	1,795	8,849	883	2.7
1997/98*	--	80.2	73.7	127.0	9,366	10,259	5,850	1,835	1,625	9,310	949	2.45-2.65
		Mil. acres		*Bu./acre*				*Mil bu.*				*$/bu.*
Sorghum												
1993/94	2.3	9.9	8.9	59.9	534	709	456	4	202	662	48	2.3
1994/95	1.6	9.8	8.9	72.8	649	697	400	3	223	625	72	2.1
1995/96*	1.7	9.5	8.3	55.6	460	532	305	11	198	514	18	3.2
1996/97*	--	13.2	11.9	67.5	803	821	529	40	205	774	47	2.3
1997/98*	--	10.1	9.4	69.5	653	701	425	35	200	660	41	2.15-2.35
		Mil. acres		*Bu./acre*				*Mil. bu.*				*$/bu.*
Barley												
1993/94	2.5	7.8	6.8	58.9	398	621	244	172	66	482	139	2.0
1994/95	2.7	7.2	6.7	56.2	375	580	228	173	66	467	113	2.0
1995/96*	2.9	6.7	6.3	57.3	360	513	179	172	62	413	100	2.9
1996/97*	--	7.1	6.8	58.5	396	532	220	172	31	423	109	2.7
1997/98*	--	6.9	6.4	58.3	374	524	160	172	80	412	112	2.35-2.45
		Mil. acres		*Bu./acre*				*Mil. bu.*				*$/bu.*
Oats												
1993/94	0.8	7.9	3.8	54.4	207	427	225	93	3	321	106	1.4
1994/95	0.6	6.6	4.0	57.1	229	428	234	92	1	327	101	1.2
1995/96*	0.8	6.3	3.0	54.7	162	343	183	92	2	277	66	1.7
1996/97*	--	4.7	2.7	57.8	155	319	155	95	3	252	67	2.0
1997/98*	--	5.2	2.9	60.5	176	353	175	95	2	272	81	1.55-1.65
		Mil. acres		*Bu./acre*				*Mil. bu.*				*$/bu.*
Sovbeans[7]												
1993/94	--	60.1	57.3	32.6	1,871	2,170	7/ 96	1,276	589	1,961	209	6.4
1994/95	--	61.7	60.9	41.4	2,517	2,731	7/ 153	1,405	838	2,396	335	5.5
1995/96*	--	62.6	61.6	35.3	2,177	2,516	7/ 112	1,370	851	2,333	183	6.7
1996/97*	--	64.2	63.4	37.6	2,382	2,575	7/ 126	1,436	882	2,443	131	7.4
1997/98*	--	70.9	69.9	39.0	2,727	2,865	7/ 139	1,520	950	2,610	255	6.20-6.80
								Mil. lbs.				*Cents/lb.*
Soybean oil												
1993/94	--	--	--	--	13,951	15,574	--	12,941	1,529	14,471	1,103	27.1
1994/95	--	--	--	--	15,613	16,733	--	12,916	2,680	15,597	1,137	27.6
1995/96*	--	--	--	--	15,240	16,472	--	13,465	992	14,457	2,015	24.8
1996/97*	--	--	--	--	15,743	17,811	--	14,247	2,045	16,291	1,520	22.5
1997/98*	--	--	--	--	16,970	18,550	--	14,500	2,600	17,100	1,450	25.50-27.50
						1,000 tons						*$/ton[8]*
Soybean meal												
1993/94	--	--	--	--	30,514	30,788	--	25,283	5,356	30,639	150	192.9
1994/95	--	--	--	--	33,270	33,483	--	26,542	6,717	33,260	223	162.6
1995/96*	--	--	--	--	32,527	32,826	--	26,611	6,002	32,613	212	236.0
1996/97*	--	--	--	--	34,209	34,523	--	27,322	6,994	34,316	207	270.9
1997/98*	--	--	--	--	35,843	36,175	--	28,350	7,600	35,950	225	190-200

See footnotes at end of table, next page

Table 17—Supply & Utilization (continued)

| | Area | | | | | | Feed | Other | | | | |
	Set aside[3]	Planted	Harvested	Yield	Production	Total Supply[4]	& residual	domestic use	Exports	Total Use	Ending stocks	Farm price[5]
	Mil. Acres			_Lb./acre_	_Mil. Bales_							_Cents/lb._
Cotton[9]												
1993/94	1.4	13.4	12.8	606.0	16.1	20.8	--	10.4	6.9	17.3	3.5	58.1
1994/95	1.7	13.7	13.3	708.0	19.7	23.2	--	11.2	9.4	20.6	2.7	72.0
1995/96*	0.3	16.9	16.0	536.0	17.9	21.0	--	10.7	7.7	18.3	2.6	75.40 #
1996/97*	--	14.6	12.9	707.0	18.9	22.0	--	11.1	6.9	18.1	4.0	69.30 #
1997/98*	--	13.8	13.3	686.0	19.0	23.0	--	11.5	7.5	19.0	4.0	--

-- = Not available or not applicable.   *March 12, 1998 Supply and Demand Estimates. 1. Marketing year beginning June 1 for wheat, barley, and oats, August 1 for cotton and rice, September 1 for soybeans, corn, and sorghum, October 1 for soymeal and soyoil. 2. Conversion factors: Hectare (ha.) = 2.471 acres, 1 metric ton = 2.204.622 pounds, 36.7437 bushels of wheat or soybeans, 39.3679 bushels of corn or sorghum, 45.9296 bushels of barley, 68.8944 bushes of oats, 22.046 cwt of rice, and 4.59 480-pound bales of cotton. 3. Includes diversion, acreage reduction, 50-92, & 0-92 programs. 0/92 & 50/92 set-aside includes idled acreage and acreage planted to minor oilseeds, sesame, and crambe. 4. Includes imports. 5. Marketing-year weighted average price received by farmers. Does not include an allowance for loans outstanding and Government purchases. 6. Residual included in domestic use. 7. Includes seed. 8. Simple average of 48 percent, Decatur. 9. Upland and extra-long staple. Stocks estimates based on Census Bureau data, resulting in an unaccounted difference between supply and use estimates and changes in ending stocks. 10. Weighted average for August through July. 11. Weighted average for August through March. _Information contacts: Wheat, rice, feed grains, Jenny Gonzales (202) 694-5296; soybeans, soybean products, and cotton, Mae Dean Johnson (202) 694-5299_

Table 18—Cash Prices, Selected U.S. Commodities

| | Marketing year[1] | | | 1996 | 1997 | | | | | | |
	1994/95	1995/96	1996/97	Dec	Jul	Aug	Sep	Oct	Nov	Dec
Wheat, no. 1 HRW,										
Kansas City ($/bu.)[2]	3.97	5.49	4.88	4.70	3.57	3.84	3.86	3.88	3.87	3.72
Wheat, DNS,										
Minneapolis ($/bu.)[3]	4.26	5.72	4.97	4.51	4.36	4.49	4.36	4.35	4.42	4.27
Rice, S.W. La. ($/cwt)[4]	14.55	18.90	20.34	19.75	20.50	20.06	19.40	18.94	19.25	19.25
Corn, no. 2 yellow, 30 day,										
Chicago ($/bu.)	2.43	3.97	2.84	2.69	2.57	2.69	2.66	2.76	2.77	2.70
Sorghum, no. 2 yellow,										
Kansas City ($/cwt)	4.10	6.66	4.54	4.22	4.18	4.28	4.13	4.36	4.30	4.26
Barley, feed,										
Duluth ($/bu.)	2.02	2.67	2.32	1.96	2.04	2.10	2.29	2.05	1.98	1.66
Barley, malting										
Minneapolis ($/bu.)	2.75	3.69	3.18	--	1.74	2.66	2.74	2.74	--	--
U.S. cotton price, SLM,										
1-1/16 in. (cents /lb.)[5]	88.10	83.00	71.60	72.00	71.80	71.60	70.80	69.50	68.90	64.60
Northern Europe prices										
cotton index (cents/lb.)[6]	92.70	85.60	78.70	79.20	81.50	81.10	79.50	77.60	77.10	74.70
U.S. M 1-3/32 in. (cents/lb.)[7]	99.70	94.70	82.90	83.90	83.70	83.90	82.50	80.50	79.80	77.30
Soybeans, no. 1 yellow, 30 day										
Chicago ($/bu)	5.48	6.72	7.38	7.01	7.62	7.45	6.49	6.75	7.18	6.92
Soybean oil, crude,										
Decatur (cents/lb.)	27.60	24.75	22.50	21.60	21.89	22.06	22.88	24.31	25.73	25.08
Soybean meal, 48% protein,										
Decatur ($/ton)	162.55	236.00	270.90	250.60	273.60	273.30	278.30	229.30	245.30	222.50

-- = No quotes. 1. Beginning June 1 for wheat and barley; Aug. 1 for rice and cotton; Sept. 1 for corn, sorghum, and soybeans; Oct. 1 for soymeal and oil. 2. Ordinary protein. 3. 14% protein. 4. Long grain, milled basis. 5. Average spot market. 6. Liverpool Cotlook "A" Index; average of five lowest prices of 13 selected growths. 7. Cotton, Memphis territory growths. _Information contacts: Wheat, rice, and feed, Jenny Gonzales (202) 694-5296; soybeans, soybean products, and cotton, Mae Dean Johnson (202) 694-5299_

Table 19—Farm Programs, Price Supports, Participation, & Payment Rates

	Target price	Basic loan rate	Findley or announced loan rate[1]	Total deficiency	Effective base acres[2]	Program[3]	Flexibility contract payment rate	Acres under contract	Contract payment yields	Partici-pation rate[4]
					Mil. acres	*Percent of base*				
		$/bu.					*$/bu.*	*Mil. acres*	*Bu./cwt*	*Percent*
Wheat										
1993/94	4.00	2.86	2.45	1.03	78.50	0/0/0	--	--	--	88
1994/95	4.00	2.72	2.58	0.61	78.10	0/0/0	--	--	--	87
1995/96	4.00	2.69	2.58	0.00	77.70	0/0/0	--	--	--	85
1996/97	--	--	2.58	--	--	--	0.874	76.4	34.70	99
1997/98[8]	--	--	2.58	--	--	--	0.610	76.1	34.60	99
		$/cwt					*$/cwt*			
Rice										
1993/94	10.71	6.50	5.53 [5]	3.98	4.10	5/0/0	--	--	--	97
1994/95	10.71	6.50	5.88 [5]	3.79	4.20	0/0/0	--	--	--	95
1995/96	10.71	6.50	6.50 [5]	3.22 [9]	4.20	5/0/0	--	--	--	95
1996/97	--	6.50	--	--	--	--	2.766	4.1	48.15	99
1997/98[8]	--	6.50	--	--	--	--	2.740	4.1	48.09	99
		$/bu.					*$/bu.*			
Corn										
1993/94	2.75	1.99	1.72	0.28	81.80	10/0/0	--	--	--	76
1994/95	2.75	1.99	1.89	0.57	81.50	0/0/0	--	--	--	81
1995/96	2.75	1.94	1.89	0.00	81.80	7.5/0/0	--	--	--	82
1996/97	--	--	1.89	--	--	--	0.251	80.5	102.90	98
1997/98[8]	--	--	1.89	--	--	--	0.460	80.4	102.80	98
		$/bu.					*$/bu.*			
Sorghum										
1993/94	2.61	1.89	1.63	0.25	13.50	5/0/0	--	--	--	82
1994/95	2.61	1.89	1.80	0.59	13.50	0/0/0	--	--	--	81
1995/96	2.61	1.84	1.80	0.00	13.30	0/0/0	--	--	--	77
1996/97	--	--	1.81	--	--	--	0.323	13.0	57.30	99
1997/98[8]	--	--	1.76	--	--	--	0.500	13.0	57.30	99
		$/bu.					*$/bu.*			
Barley										
1993/94	2.36	1.62	1.40	0.67	10.80	0/0/0	--	--	--	83
1994/95	2.36	1.62	1.54	0.52	10.70	0/0/0	--	--	--	84
1995/96	2.36	1.58	1.54	0.00	10.70	0/0/0	--	--	--	82
1996/97	--	--	1.55	--	--	--	0.332	10.5	47.30	99
1997/98[8]	--	--	1.57	--	--	--	0.250	10.5	47.20	99
		$/bu.					*$/bu.*			
Oats										
1993/94	1.45	1.02	0.88	0.11	7.10	0/0/0	--	--	--	46
1994/95	1.45	1.02	0.97	0.19	6.80	0/0/0	--	--	--	40
1995/96	1.45	1.00	0.97	0.00	6.50	0/0/0	--	--	--	44
1996/97	--	--	1.03	--	--	--	0.033	6.2	50.80	97
1997/98[8]	--	--	1.11	--	--	--	0.030	6.2	50.80	97
		$/bu.					*$/bu.*			
Soybeans[6]										
1993/94	--	--	5.02	--	--	--	--	--	--	--
1994/95	--	--	4.92	--	--	--	--	--	--	--
1995/96	--	--	4.92	--	--	--	--	--	--	--
1996/97	--	--	4.97	--	--	--	--	--	--	--
1997/98	--	--	5.26	--	--	--	--	--	--	--
		Cents/lb.					*Cents/lb.*			
Upland cotton										
1993/94	72.90	52.35	47.50 [7]	18.60	15.10	7.5/0/0	--	--	--	91
1994/95	72.90	50.00	50.00 [7]	4.60	15.30	11/0/0	--	--	--	89
1995/96	72.90	51.92	51.92 [7]	0.00 [9]	15.50	0/0/0	--	--	--	79
1996/97	--	51.92	--	--	--	--	8.882	16.0	606.00	99
1997/98[8]	--	51.92	--	--	--	--	7.400	16.2	609.00	99

-- = Not available. 1. There are no Findley loan rates for rice or cotton. See footnotes 5 and 7. 2. Prior to 1996, national effective crop acreage base as determined by FSA. Net of CRP. 3. Program requirements for participating producers (mandatory acreage reduction program/mandatory paid land diversion/optional paid land diversion). Acres idled must be devoted to a conserving use to receive program benefits. 4. Percentage of effective base enrolled in acreage reduction programs. Stating in 1996, participation rate is the percent of eligible acres that entered production flexibility contracts. 5. A marketing loan has been in effect for rice since 1985/86. Loans may be repaid at the lower of: a) the loan rate or b) the adjusted world market price (announced weekly). Loans cannot be repaid at less than a specified fraction of the loan rate. Data refer to marketing-year average loan repayment rates. Beginning with the 1996 crop, loans are repaid at the lower of the loan rate plus accumulated interest or the adjusted world price. 6. There are no target prices, base acres, acreage reduction programs or deficiency payment rates for soybeans. 7. A marketing loan has been in effect for cotton since 1986/87. In 1987/88 and after, loans may be repaid at the lower of: a) the loan rate or b) the adjusted world market price (announced weekly; Plan B). Starting in 1991/92, loans cannot be repaid at less than 70 percent of the loan rate. Data refer to annual average loan repayment rates. Beginning with the 1996 crop, loans are repaid at the lower of the loan rate plus accumulated interest or the adjusted world price. 8. Estimated payment rates and acres under contract. 9. Guaranteed payment rates for producers in the 50/85/92 program were $0.034/lb. for upland cotton and $4.21/cwt. for rice. *Note:* The 1996 Act replaced target prices and deficiency payments with fixed annual payments to producers. *Information contact: Brenda Chewning, Farm Service Agency, (202)720-8838.*

Table 20—Fruit

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Citrus[1]										
Production (1,000 tons)	12,761	13,186	10,860	11,285	12,452	15,274	14,561	15,799	16,009	17,468
Per capita consumpt. (lb.)[2]	25.4	23.6	21.4	19.1	24.4	26.0	25.0	24.1	24.9	27.6
Noncitrus[3]										
Production (1,000 tons)	15,911	16,345	15,640	15,740	17,124	16,563	17,341	16,356	16,117	17,656
Per capita consumpt. (lb.)[2]	71.7	72.3	70.7	70.6	74.5	73.1	75.6	73.9	73.7	73.5

				1997					1998	
	Feb	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Grower Prices										
Apples (cents/pound)[4]	20.3	13.7	14.1	19.2	24.2	24.0	22.1	23.7	22.3	21.6
Pears (cents/pound)[4]	26.0	28.4	15.5	16.5	18.0	16.7	16.5	14.4	12.7	13.0
Oranges ($/box)[5]	3.60	4.62	5.08	6.93	6.95	3.69	2.15	2.53	2.58	3.53
Grapefruit ($/box)[5]	2.12	1.82	6.92	5.78	4.18	4.15	2.49	2.57	1.79	1.61
Stocks, ending										
Fresh apples (mil. lb.)	2,877	736	296	85	2,968	5,701	5,165	4,423	3,737	--
Fresh pears (mil. lb.)	118	10	65	117	616	585	446	337	274	--
Frozen fruits (mil. lb.)	866	775	939	1,029	1,051	1,440	1,356	1,233	1,121	--
Frozen conc. orange juice (mil. single-strength gallons)	685	807	719	641	526	466	496	614	795	--

P = preliminary. -- = Not available. 1. Year shown is when harvest concluded. 2. Fresh per capita consumption. 3. Calendar year. 4. Fresh use. 5. U.S. equivalent on-tree returns. *Information contact: Susan Pollack (202)694-5257*

Table 21—Vegetables

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Production 1/										
Total vegetables (1,000 cwt)	467,915	543,435	562,938	565,754	677,975	675,793	762,934	742,595	759,347	752,266
Fresh (1,000 cwt) 2/ 4/	240,249	254,418	254,039	242,733	393,249	377,698	396,671	391,699	408,823	428,171
Processed (tons) 3/ 4/	11,383,320	14,450,860	15,444,970	16,151,030	14,236,320	14,904,750	18,313,150	17,544,780	17,526,190	16,204,740
Mushrooms (1,000 cwt) 5/	667,759	714,992	749,151	746,832	776,357	750,799	782,340	777,870	776,677	--
Potatoes (1,000 cwt)	356,438	370,444	402,110	417,622	425,367	428,693	467,054	443,606	498,633	459,912
Sweetpotatoes (1,000 cwt)	10,945	11,358	12,594	11,203	12,005	11,053	13,395	12,906	13,456	13,025
Dry edible beans (1,000 cwt)	19,253	23,729	32,379	33,765	22,615	21,913	29,028	30,812	27,960	29,156

				1997					1998	
	Feb	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Shipments (1,000 cwt)										
Fresh	19,561	26,423	25,006	16,857	14,732	19,060	18,525	16,843	23,713	18,723
Iceberg lettuce	3,502	3,159	3,722	3,225	3,195	3,417	3,144	2,584	4,089	3,233
Tomatoes, all	3,535	3,565	3,747	2,648	2,356	3,367	2,737	3,196	4,189	3,057
Dry-bulb onions	2,856	2,623	3,559	3,162	3,437	4,172	3,270	2,997	4,075	3,436
Others 6/	9,668	17,076	13,978	7,822	5,744	8,104	9,374	8,066	11,360	8,997
Potatoes, all	12,138	11,472	10,661	8,352	9,589	13,328	12,180	11,925	16,328	11,870
Sweetpotatoes	206	121	168	127	152	375	636	172	146	180

-- = Not available. 1. Calendar year except mushrooms. 2. Includes fresh production of asparagus, broccoli, carrots, cauliflower, celery, sweet corn, lettuce, honeydews, onions, & tomatoes through 1991. 3. Includes processing production of snap beans, sweet corn, green peas, tomatoes, cucumbers (for pickles), asparagus, broccoli, carrots, & cauliflower. 4. Data after 1991 not comparable to previous years because commodity estimates reinstated in 1992 are included. 5. Fresh & processing agaricus mushrooms only. Excludes specialty varieties. Crop year July 1- June 30. 6/ Includes snap beans, broccoli, cabbage, cauliflower, celery, sweet corn, cucumbers, eggplant, bell peppers, honeydews, & watermelons. -- = not available. *Information contact: Gary Lucier (202)694-5253*

Table 22—Other Commodities

		Annual		1996			1997			
	1994	1995	1996	II	III	IV	I	II	III	IV
Sugar										
Production[1]	7,669	7,977	7,268	694	570	3,874	2,075	679	576	4,088
Deliveries[1]	9,321	9,451	9,633	2,390	2,557	2,471	2,215	2,436	2,643	2,470
Stocks, ending[1]	3,139	2,904	3,195	2,285	1,492	3,195	3,901	2,734	1,485	3,376
Coffee										
Composite green price N.Y. (cents/lb.)	138.62	142.18	104.74	109.46	103.13	98.82	134.80	172.99	143.29	134.89
Imports, green bean equiv. (mil. lbs.)[2]	2,048	2,182	2,494	571	570	639	--	--	--	--

		Annual		1996			1997			
	1994	1995	1996	Jul	Feb	Mar	Apr	May	Jun	Jul
Tobacco										
Avg. price to grower[3]										
Flue-cured ($/lb.)	169.8	179.0	183.4	160.0	--	--	--	--	--	--
Burley ($/lb.)	181.4	185.4	192.2	--	190.0	--	--	--	--	--
Domestic consumption[4]										
Cigarettes (bil.)	488.6	487.3	486.0	37.0	30.4	39.1	37.8	42.3	43.2	40.1
Large cigars (mil.)	2,290.8	2,561.6	3,166.4	277.2	232.8	333.3	276.3	298.4	311.5	318.6

-- = Not available. 1. 1,000 short tons, raw value. Quarterly data shown at end of each quarter. 2. Net imports of green and processed coffee. 3. Crop year July-June for flue cured, Oct.-Sept. for burley. 4. Taxable removals. *Information contacts: Sugar, Fannye Lockley (202) 694-5249; tobacco, Tom Capehart (202) 694-5245*

World Agriculture

Table 23—World Supply & Utilization of Major Crops, Livestock & Products_____

	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98
					Million units					
Wheat										
Area (hectares)	217.4	225.8	231.4	222.5	223.2	222.4	215.2	219.5	230.7	229.5
Production (metric tons)	495.0	533.2	588.0	543.0	562.3	559.3	524.6	537.5	582.6	609.2
Exports (metric tons[1]	104.3	103.7	100.7	110.8	112.2	100.2	98.2	95.5	97.7	99.2
Consumption (metric tons)[2]	524.3	532.7	561.5	555.9	550.3	562.4	548.3	550.6	578.2	586.1
Ending stocks (metric tons)[3]	118.4	118.9	145.4	132.5	144.6	141.5	117.7	104.7	108.1	131.2
Coarse Grains										
Area (hectares)	323.9	321.4	315.7	321.8	323.8	317.7	323.4	313.4	322.2	316.5
Production (metric tons)	722.0	792.4	827.5	810.3	871.7	799.4	873.7	801.8	907.9	896.4
Exports (metric tons[1]	98.0	104.5	89.5	96.0	91.8	85.7	97.1	87.9	93.1	89.1
Consumption (metric tons)[2]	787.2	816.6	815.1	810.0	843.7	838.7	861.3	842.7	883.4	901.5
Ending stocks (metric tons)[3]	147.2	123.1	135.4	135.2	163.1	123.8	136.2	95.3	119.9	114.9
Rice, milled										
Area (hectares)	146.0	146.5	146.7	147.3	146.7	145.5	147.9	148.0	149.5	149.3
Production (metric tons)	331.5	343.8	352.2	354.7	355.7	355.5	364.5	371.2	380.1	382.2
Exports (metric tons[1]	13.9	11.7	12.1	14.1	14.9	16.5	21.0	19.5	18.9	21.1
Consumption (metric tons)[2]	327.6	338.8	347.7	356.3	357.8	358.7	367.1	371.5	377.3	379.6
Ending stocks (metric tons)[3]	48.7	54.0	58.5	57.2	55.0	51.9	49.3	49.0	51.9	54.5
Total Grains										
Area (hectares)	687.3	693.7	693.8	691.6	693.7	685.6	686.5	680.9	702.4	695.3
Production (metric tons)	1,548.5	1,669.4	1,767.7	1,708.0	1,789.7	1,714.2	1,762.8	1,710.5	1,870.6	1,887.8
Exports (metric tons[1]	216.2	219.9	202.3	220.9	218.9	202.4	216.3	202.9	209.7	209.4
Consumption (metric tons)[2]	1,639.1	1,687.9	1,724.3	1,722.2	1,751.8	1,759.8	1,776.7	1,764.8	1,839.9	1,867.2
Ending stocks (metric tons)[3]	314.3	296.0	339.3	324.9	362.7	317.2	303.2	249.0	279.9	300.6
Oilseeds										
Crush (metric tons)	164.5	171.7	176.7	185.1	184.4	190.1	208.1	217.8	219.3	227.4
Production (metric tons)	201.6	212.4	215.7	224.3	227.5	229.4	262.9	259.7	261.4	283.6
Exports (metric tons)	31.5	35.6	33.4	37.6	38.2	38.7	44.1	44.3	48.7	5.1
Ending stocks (metric tons)	22.1	23.7	23.4	21.9	23.6	20.3	27.2	22.2	16.9	23.5
Meals										
Production (metric tons)	111.1	116.8	119.3	125.2	125.2	131.7	141.9	147.5	149.5	155.4
Exports (metric tons)	37.4	39.8	40.7	42.2	40.8	44.9	46.7	49.8	50.1	51.1
Oils										
Production (metric tons)	53.3	57.1	58.1	60.6	61.1	63.7	69.7	73.3	75.2	77.2
Exports (metric tons)	18.1	20.4	20.5	21.3	21.3	24.3	27.1	25.8	28.1	28.3
Cotton										
Area (hectares)	33.8	31.6	33.2	34.8	32.6	30.7	32.2	35.9	33.9	33.7
Production (bales)	84.4	79.7	87.0	95.7	82.5	76.7	85.6	93.0	89.2	90.1
Exports (bales)	33.4	31.3	29.8	28.2	25.6	26.7	28.4	27.9	26.5	26.3
Consumption (bales)	85.2	86.9	85.6	86.0	85.8	85.5	85.6	87.0	88.6	89.6
Ending stocks (bales)	30.8	24.8	26.9	37.0	34.4	26.3	28.3	33.8	36.3	38.0
		1989	1990	1991	1992	1993	1994	1995	1996	1997
Red meat[4]										
Production (metric tons)		112.3	116.9	117.7	117.3	118.2	123.3	128.8	135.1	136.2
Consumption (metric tons)		110.9	114.8	116.1	115.7	117.2	122.3	127.4	132.4	134.4
Exports (metric tons)[1]		8.2	7.5	7.5	7.4	7.3	8.0	8.1	8.5	8.2
Poultry[4]										
Production (metric tons)		33.1	37.6	39.6	38.0	40.5	43.9	47.7	50.5	53.8
Consumption (metric tons)		32.6	36.5	38.4	37.0	39.4	42.5	46.2	48.9	52.0
Exports (metric tons)[1]		1.7	2.4	2.8	2.4	2.8	3.7	4.6	5.3	5.9
Dairy										
Milk production (metric tons)[5]		387.4	395.0	377.6	378.4	377.6	378.4	380.8	379.8	381.2

Values in the last column are forcast. 1. Excludes intra-EU trade but includes intra-FSU trade. 2. Where stocks data are not available, consumption includes stock changes. 3. Stocks data are based on differing marketing years and do not represent levels at a given date. Data not available for all countries. 4. Calendar year data. 1990 data correspond with 1989/90, etc. 5. Data prior to 1989 no longer comparable.

Information contacts: Crops, Ed Allen (202) 694-5288; red meat and poultry, Shayle Shagam (202) 694-5186; dairy, LaVerne Williams (202) 694-5190

U.S. Agricultural Trade

Table 24—Prices of Principal U.S. Agricultural Trade Products

	Annual			1997					1998	
	1995	1996	1997	Feb	Sep	Oct	Nov	Dec	Jan	Feb
Export Commodities										
Wheat, f.o.b. vessel, Gulf ports ($/bu.)	4.82	5.63	4.35	4.69	4.08	4.16	4.09	3.95	3.78	3.81
Corn, f.o.b. vessel, Gulf ports ($/bu.)	3.13	4.17	2.98	3.07	2.89	3.05	2.99	2.90	2.91	2.89
Grain sorghum, f.o.b. vessel,										
Gulf ports ($/bu.)	3.13	3.90	2.89	2.92	2.72	2.92	2.90	2.85	2.88	2.87
Soybeans, f.o.b. vessel, Gulf ports ($/bu.)	6.50	7.88	7.94	7.99	7.41	7.15	7.48	7.23	7.00	7.03
Soybean oil, Decatur (cents/lb.)	26.75	23.75	23.33	22.41	22.88	24.31	25.73	25.08	25.09	26.51
Soybean meal, Decatur, ($/ton)	173.70	246.67	266.70	262.42	278.29	229.28	245.34	225.52	202.84	192.75
Cotton, 7-market avg. spot (cents/lb.)	93.45	77.93	69.62	70.53	70.75	69.46	65.35	64.57	62.86	63.66
Tobacco, ag. price at auction (cents/lb.)	178.79	183.20	182.74	205.51	175.49	178.48	184.46	192.05	192.05	195.96
Rice, f.o.b., mill, Houston ($/cwt)	16.68	19.64	20.88	21.19	20.55	19.75	19.75	19.75	19.75	19.75
Inedible tallow, Chicago (cents/lb.)	19.22	20.13	20.75	22.88	20.88	22.13	22.88	22.60	18.20	16.88
Import commodities										
Coffee, N.Y. spot ($/lb.)	1.45	1.29	2.05	1.81	2.12	1.67	1.60	1.76	1.76	1.86
Rubber, N.Y. spot (cents/lb.)	82.52	72.88	55.40	64.82	51.89	51.35	48.14	40.61	40.21	43.96
Cocoa beans, N.Y. ($/lb.)	0.61	0.62	0.69	0.56	0.77	0.76	0.73	0.76	0.73	0.71

Information contact: Mary Teymourian (202) 694-5284, or e-mail maryt@econ.ag.gov

Table 25—Indexes of Real Trade-Weighted Dollar Exchange Rates[1]

	Annual			1997						1998
	1994	1995	1996	Jan	Aug P	Sep P	Oct P	Nov P	Dec P	Jan P
				1990=100						
Total U.S. trade	102.9	105.7	110.0	105.7	116.0	114.1	112.7	111.9	114.4	116.5
Agricultural trade										
U.S. markets	101.5	103.0	105.3	103.0	105.7	105.9	106.0	108.8	113.3	115.5
U.S. competitors	97.9	99.8	102.8	99.8	109.3	109.1	108.4	107.7	110.8	114.5
Wheat										
U.S. markets	101.0	101.9	102.9	101.9	103.1	103.9	104.8	106.9	111.3	113.7
U.S. competitors	103.7	105.2	107.8	105.2	111.3	112.7	111.9	112.0	114.2	115.9
Soybeans										
U.S. markets	98.7	101.1	104.6	101.1	106.4	105.6	105.3	107.6	111.7	114.2
U.S. competitors	64.5	64.4	64.4	64.4	65.5	65.7	66.0	66.1	66.4	66.8
Corn										
U.S. markets	99.5	101.3	103.7	101.3	101.7	102.4	103.1	107.4	112.8	115.2
U.S. competitors	92.4	94.1	95.9	94.1	102.3	100.9	100.2	99.5	101.3	103.1
Cotton										
U.S. markets	97.4	98.8	100.4	98.8	103.0	104.7	106.8	109.7	122.2	134.8
U.S. competitors	107.1	107.5	108.3	107.5	107.6	109.7	109.8	109.7	109.7	109.7

1. Real indexes adjust nominal exchange rates to avoid the distortion caused by different levels of inflation among countries. A higher value means the dollar has appreciated. "Total U.S. trade" Index uses the Federal Reserve Board Index of trade-weighted value of the U.S. dollar against 10 major countries. Weights are based on relative importance of major U.S. customers and competitors in world markets. Indexes are subject to revision for up to 1 year due to delayed reporting by some countries. *Information contact: Tim Baxter (202) 694-5318 or Andy Jerado (202)694-5323*

Table 26—Trade Balance

	Calendar Year			1997						1998
	1996	1997	1998 F	Jan	Aug	Sep	Oct	Nov	Dec	Jan
				$ million						
Exports										
Agricultural	60,445	57,245	56,000	4,999	4,427	4,489	5,534	5,481	5,243	4,809
Nonagricultural	521,692	585,977	--	42,203	48,161	49,253	52,322	49,288	50,779	46,726
Total[2]	582,137	643,222	--	47,202	52,588	53,742	57,856	54,769	56,022	51,535
Imports										
Agricultural	33,643	36,289	38,000	2,979	2,848	2,900	3,052	2,840	3,262	3,197
Nonagricultural	756,827	828,412	--	64,256	69,740	73,215	77,905	68,044	71,032	67,198
Total[3]	790,470	864,701	--	67,235	72,588	76,115	80,957	70,884	74,294	70,395
Trade Balance										
Agricultural	26,802	20,956	18,000	2,020	1,579	1,589	2,482	2,641	1,981	1,612
Nonagricultural	-235,135	-242,435	--	-22,053	-21,579	-23,962	-25,583	-18,756	-20,253	-20,472
Total	-208,333	-221,479	--	-20,033	-20,000	-22,373	-23,101	-16,115	-18,272	-18,860

F = forecast. -- = Not available. 1. Forecasts based on fiscal year (Oct. 1-Sep. 30).   2. Domestic exports including Department of Defense shipments (F.A.S. Value). 3. Imports for consumption (customs value). *Information contact: Mary Fant (202) 694-5272*

Table 27—U.S. Agricultural Exports & Imports

	Calendar year 1996	1997	1998	Jan 1996	1997	Calendar year 1996	1997	1998	Jan 1996	1997
			1,000 units					$ million		
EXPORTS										
Animals, live (no.)[1]	595	1,802	--	89	129	427	566	--	29	45
Meats and preps., excl. poultry (mt)[2]	1,849	1,924	1,400	134	152	4,590	4,597	4,000	330	330
Dairy products (mt)[1]	109	125	--	4	15	727	932	900	54	72
Poultry meats (mt)	2,388	2,585	2,600	189	232	2,483	2,423	--	185	194
Fats, oils, and greases (mt)	1,257	1,089	900	82	91	614	562	--	42	49
Hides and skins incl. furskins	--	--	--	--	--	1,675	1,651	1,500	156	104
Cattle hides, whole (no.)[1]	21,410	20,113	--	1,968	1,374	1,176	1,187	--	118	72
Mink pelts (no.)[1]	3,441	3,763	--	203	251	110	97	--	5	6
Grains and feeds (mt)[3]	106,131	91,061	--	8,588	7,764	20,863	15,361	15,300	1,424	1,284
Wheat (mt)[4]	30,946	25,264	28,000	1,662	2,636	6,265	4,095	4,400	293	411
Wheat flour (mt)	491	508	500	26	28	147	138	--	8	8
Rice (mt)	2,839	2,508	2,700	240	278	1,029	932	1,000	99	101
Feed grains, incl. products (mt)[5]	58,687	49,032	47,900	5,318	3,676	9,575	6,211	5,600	688	448
Feeds and fodders (mt)	11,842	12,352	12,700	1,243	1,041	2,646	2,669	2,600	241	217
Other grain products (mt)	1,325	1,397	--	99	106	1,200	1,316	--	96	100
Fruits, nuts, and preps. (mt)	3,689	3,896	--	305	273	4,282	4,235	4,500	300	269
Fruit juices incl.										
froz. (1,000 hectoliters)[1]	9,719	10,689	--	813	580	634	662	--	56	40
Vegetables and preps. (mt)	3,142	3,402	--	264	263	3,822	4,152	2,800	337	341
Tobacco, unmanufactured (mt)	222	222	--	20	21	1,390	1,553	1,600	127	114
Cotton, excl. linters (mt)[6]	1,497	1,568	1,600	145	160	2,715	2,682	2,700	261	267
Seeds (mt)	895	1,098	--	142	91	795	884	900	121	130
Sugar, cane or beat (mt)[1]	244	125	--	16	8	95	54	--	8	3
Oilseeds and products (mt)	34,213	36,665	36,700	3,973	3,902	10,792	12,057	11,200	1,193	1,202
Oilseeds (mt)	26,181	26,764	--	2,941	2,550	7,875	8,326	--	850	723
Soybeans (mt)	25,566	26,023	25,900	2,886	2,480	7,324	7,379	6,700	799	664
Protein meal (mt)	6,131	7,311	--	850	997	1,542	1,966	--	224	245
Vegetable oils (mt)	1,901	2,590	--	182	355	1,375	1,766	--	119	235
Essential oils (mt)	44	45	--	3	3	593	588	--	56	41
Other	132	173	--	15	11	3,948	4,287	--	319	322
Total	155,812	143,978	149,200	13,880	12,986	60,445	57,245	56,000	4,999	4,809
IMPORTS										
Animals, live (no.)[1]	4,871	5,331	--	440	547	1,545	1,594	1,600	128	149
Meats and preps., excl. poultry (mt)	1,039	1,154	1,200	95	106	2,295	2,630	2,800	209	234
Beef and veal (mt)	708	797	--	64	76	1,341	1,609	--	122	160
Pork (mt)	252	261	--	22	21	728	754	--	64	50
Dairy products (mt)[1]	347	354	--	31	31	1,274	1,225	1,400	80	93
Poultry and products[1]	--	--	--	--	--	181	195	--	17	17
Fats, oils, and greases (mt)	59	80	--	6	6	49	60	--	4	4
Hides and skins, incl. furskins (mt)	--	--	--	--	--	205	206	--	32	25
Wool, unmanufactured (mt)	44	44	--	6	5	152	154	--	20	19
Grains and feeds (mt)	6,784	8,342	8,700	612	543	2,657	2,963	3,200	213	216
Fruits, nuts, and preps.,										
excl. juices (mt)[7]	6,962	7,252	7,500	611	623	3,640	3,837	5,100	349	328
Bananas and plantains (mt)	4,001	3,998	4,000	312	337	1,184	1,220	1,300	96	94
Fruit juices (1,000 hectoliters)[1]	28,002	27,807	30,000	2,506	2,461	913	829	--	77	62
Vegetables and preps. (mt)	4,071	4,218	4,800	457	488	3,526	3,707	4,000	364	449
Tobacco, unmanufactured (mt)	302	294	400	40	30	923	1,089	1,400	165	118
Cotton, unmanufactured (mt)	189	17	--	1	1	300	20	--	1	1
Seeds (mt)	199	224	--	14	14	310	371	--	27	29
Nursery stock and cut flowers[1]	--	--	--	--	--	952	1,004	1,200	77	105
Sugar, cane or beet (mt)	2,891	2,913	--	351	136	1,087	984	--	105	48
Oilseeds and products (mt)	3,419	3,963	3,600	296	407	2,147	2,242	2,100	183	198
Oilseeds (mt)	776	1,035	--	70	90	330	384	--	28	32
Protein meal (mt)	1,001	1,048	--	73	108	179	188	--	14	17
Vegetable oils (mt)	1,643	1,880	--	153	209	1,637	1,670	--	141	149
Beverages excl. fruit										
juices (1,000 hectoliters)[1]	20,138	23,792	--	1,387	1,595	2,903	3,375	--	189	216
Coffee, tea, cocoa, spices (mt)	2,256	2,265	--	205	221	4,797	6,048	--	429	583
Coffee, incl. products (mt)	1,123	1,180	1,200	99	109	2,788	3,886	3,400	234	355
Cocoa beans and products (mt)	821	767	800	80	86	1,400	1,471	1,600	140	170
Rubber and allied gums (mt)	1,034	1,068	1,100	96	106	1,468	1,229	1,300	122	97
Other	--	--	--	--	--	2,321	2,528	--	187	207
Total	--	--	--	--	--	33,643	36,289	38,000	2,979	3,197

-- = Not available. 1997 data are from *Foreign Agricultural Trade of the U.S.* Annual values for most recent year are forecasts from *Outlook for U.S. Agricultural Exports.* 1. Not included in total volume. 2. Forecast includes only beef, pork, and variety meat. 3. Forecast includes pulses. 4. Forecast includes wheat flour. 5. Forecast excludes grain products. 6. Forecast includes linters. 7. Forecast includes juice. *Note:* totals include transshipments through Canada, but transshipments are not distributed by commodity as previously. *Information contact: Mary Fant (202) 694-5272*.

Table 28—U.S. Agricultural Exports by Region

Region & country	Calendar year 1996	1997	1998	Jan 1996	1997	Change from year earlier 1996	1997	1998	Jan 1996	1997
	_____$ million_____					_____Percent_____				
WESTERN EUROPE	9,702	9,540	9,500	1,009	988	7	-2	--	-11	-2
European Union[1]	9,322	8,918	8,800	988	966	7	-4	--	-10	-2
Belgium-Luxembourg	749	668	--	65	78	14	-11	--	-9	20
France	524	570	--	76	89	-2	9	--	20	17
Germany	1,489	1,319	--	150	125	20	-11	--	-1	-17
Italy	796	756	--	71	92	13	-5	--	-12	29
Netherlands	2,218	1,928	--	239	196	1	-13	--	10	-18
United Kingdom	1,233	1,312	--	113	116	15	6	--	-5	2
Portugal	291	249	--	36	17	7	-14	--	-50	-52
Spain incl. Canary Islands	1,124	1,140	--	144	166	-9	1	--	-38	15
Other Western Europe	380	622	700	21	21	10	64	--	-39	0
Switzerland	211	517	--	15	16	0	144	--	-3	8
EASTERN EUROPE	439	282	300	41	23	44	-36	--	-5	-43
Poland	232	121	--	13	12	96	-48	--	-38	-9
Former Yugoslavia	88	96	--	18	3	12	9	--	1,244	-82
Romania	57	16	--	0	2	-7	-72	--	-98	381
NEWLY INDEPENDENT STATES	1,747	1,483	1,200	119	123	31	-15	--	4	4
Russia	1,328	1,204	1,000	98	109	29	-9	--	4	11
ASIA[2]	28,560	25,624	21,500	2,365	1,889	1	-10	--	-9	-20
West Asia (Mideast)	2,513	2,553	2,500	199	227	1	2	--	-5	14
Turkey	637	727	--	68	61	19	14	--	20	-10
Iraq	3	82	--	0	37	31	2,913	--	0	7,482
Israel, incl. Gaza and W. Bank	617	537	500	48	34	28	-13	--	-14	-28
Saudi Arabia	551	618	600	38	53	6	12	--	-3	38
South Asia	653	760	800	68	90	-36	16	--	-19	31
Bangladesh	88	120	--	20	18	-60	37	--	330	-13
India	113	155	--	9	14	-42	38	--	29	64
Pakistan	352	442	500	38	57	-22	26	--	-38	49
China	2,092	1,600	1,600	140	151	-21	-24	--	-32	8
Japan	11,704	10,532	10,300	975	836	5	-10	--	-2	-14
Southeast Asia	3,270	2,988	2,300	327	171	7	-9	--	-15	-48
Indonesia	852	772	--	90	47	4	-9	--	-28	-48
Philippines	892	873	800	73	50	16	-2	--	-15	-32
Other East Asia	8,327	7,191	6,500	656	414	6	-14	--	-10	-37
Korea, Rep.	3,871	2,857	2,400	314	130	3	-26	--	-6	-59
Hong Kong	1,490	1,712	1,700	116	107	-1	15	--	13	-7
Taiwan	2,965	2,616	2,400	226	176	14	-12	--	-22	-22
AFRICA	2,877	2,267	2,300	142	278	-3	-21	--	-53	96
North Africa	1,986	1,559	1,500	81	225	-4	-21	--	-64	178
Morocco	244	163	--	0	24	49	-33	--	-99	5,248
Algeria	322	315	300	23	33	-25	-2	--	-54	42
Egypt	1,319	964	900	53	148	-4	-27	--	-53	178
Sub-Sahara	891	707	800	61	53	-3	-21	--	-15	-13
Nigeria	190	115	--	8	12	51	-39	--	-57	54
Rep. S. Africa	309	220	--	31	24	10	-29	--	-9	-24
LATIN AMERICA and CARIBBEAN	10,486	10,363	10,800	759	907	30	-1	--	-9	20
Brazil	588	536	500	41	33	10	-9	--	33	-18
Caribbean Islands	1,419	1,501	--	119	132	10	6	--	33	12
Central America	1,006	1,047	--	75	97	15	4	--	-12	29
Colombia	631	538	--	50	37	33	-15	--	0	-26
Mexico	5,447	5,184	5,800	346	449	54	-5	--	-23	30
Peru	310	193	--	14	38	3	-38	--	-60	176
Venezuela	483	571	600	54	46	-1	18	--	63	-15
CANADA	6,146	6,795	6,900	523	556	6	11	--	14	6
OCEANIA	489	550	600	42	44	-4	13	--	16	4
TOTAL	60,445	57,245	56,000	4,999	4,809	7	-5	--	-10	-4
Developed countries	28,890	28,431	--	2,617	2,475	6	-2	--	-3	-5
Developing countries	27,681	25,687	--	2,121	2,055	10	-7	--	-15	-3
Other countries	3,873	3,128	--	261	279	-3	-19	--	-20	7

-- = Not available. Annual values for the most recent year are forecasts. 1. Austria, Finland, and Sweden are included in the European Union.
2. Asia forecasts exclude West Asia (Mideast). *Note:* Adjusted for transhipments through Canada, but transhipments are not distributed as previously.
Information contact: Mary Fant (202) 694-5272

Farm Income

Table 29—Farm Income Statistics

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
					$ billion					
1. Farm receipts	169.4	177.8	176.1	179.5	186.6	190.4	197.8	213.3	212.9	209.0
Crops (incl. net CPC loans)	76.9	80.3	82.1	85.7	87.5	93.1	100.7	109.4	108.9	106.7
Livestock	83.9	89.2	85.8	85.6	90.2	88.2	87.0	92.9	92.6	91.3
Farm related[1]	8.6	8.2	8.2	8.2	9.0	9.2	10.1	11.0	11.4	11.0
2. Direct Government payments	10.9	9.3	8.2	9.2	13.4	7.9	7.3	7.3	7.9	7.4
Cash payments	9.1	8.4	8.2	9.2	13.4	7.9	7.3	7.3	7.9	7.4
Value of PIK commodities	1.7	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3. Gross cash income (1+2)[2]	180.3	187.1	184.3	188.7	200.1	198.3	205.0	220.6	220.8	216.4
4. Nonmoney income[3]	7.9	7.9	7.8	7.6	8.1	9.2	9.8	10.2	10.9	11.6
5. Value of inventory change	3.8	3.3	-0.2	4.2	-4.5	8.2	-3.9	2.7	1.3	0.1
6. Total gross farm income (3+4+5)	191.9	198.2	191.9	200.5	203.6	215.7	210.9	233.5	233.0	228.1
7. Cash expenses[4]	127.5	134.2	134.0	133.6	141.2	147.6	153.9	160.6	165.8	164.4
8. Total expenses	146.7	153.4	153.3	152.9	160.5	167.5	174.2	181.3	186.4	185.1
9. Net cash income (3-7)	52.8	52.9	50.3	55.1	58.8	50.7	51.2	59.9	55.0	52.0
10. Net farm income (6-8)	45.3	44.8	38.5	47.5	43.1	48.3	36.7	52.2	46.6	43.0

Values for last two years are preliminary or forecast. 1. Income from machine hire, custom work, sales of forest products, and other miscellaneous cash sources. 2. Numbers in parentheses indicate the combination of items required to calculate a given item. 3. Value of home consumption of self-produced food and 'imputed gross rental value of farm dwellings. 4. Excludes capital consumption, perquisites to fired labor, and farm household expenses. Total may not add because of rounding. Note: 1988-92 accounts (primarily expenses) have been revised to reflect improved methods for estimating farm income. *Information contact: Dave Peacock (202) 694-5582*

Table 30—Average Income to Farm Operator Households[1]

	1991	1992	1993	1994	1995	1996	1997	1998
				$ per farm				
Net cash farm business income[2]	10,678	11,320	11,248	11,389	11,218	13,502	--	--
Less depreciation[3]	5,127	5,187	6,219	6,466	6,795	6,906	--	--
Less wages paid to operator[4]	441	216	454	425	522	531	--	--
Less farmland rental income[5]	323	360	534	701	769	672	--	--
Less adjusted farm business income due to other household(s)[6]	1,093	961	872	815	649	1,094	--	--
				$ per farm operator household				
Equals adjusted farm business income	3,694	4,596	3,168	2,981	2,484	4,300	--	--
Plus wages paid to operator	441	216	454	425	522	531	--	--
Plus net income from farmland rental[7]	323	360	--	--	1,053	1,178	--	--
Equal farm self-employment income	4,458	5,172	3,623	3,407	4,059	6,009	--	--
Plus other farm-related earnings[8]	1,352	2,008	1,192	970	661	1,898	--	--
Equals earnings of the operator household from farming activities	5,810	7,180	4,815	4,376	4,720	7,906	5,294	4,730
Plus earnings of the operator household from off-farm sources[9]	31,638	35,731	35,408	38,092	39,671	42,455	42,292	43,709
Equals average farm operator household income	37,447	42,911	40,223	42,469	44,392	50,361	47,586	48,439
				$ per U.S. household				
U.S. average household income[10]	37,922	38,840	41,428	43,133	44,938	47,123	--	--
				Percent				
Average farm operator household income as percent of U.S. average household income	98.7	110.5	97.1	98.5	98.8	106.9	--	--
Average operator household earnings from farming activities as percent of average operator household income	15.5	16.7	12.0	10.3	10.6	15.7	--	--

-- = Not available. Values in the last three years preliminary or forecast. 1.This table derives farm operator household income estimates from the Agricultural Resource Management Study (ARMS) that are consistent with Current Population Survey (CPS) methodology.The CPS, conducted by the Bureau of the Census, is the source of official U.S. household income statistics. The CPS defines income to include any income received as cash. The CPS definition departs from a strictly cash concept by including depreciation as an expense that farm operators and other self-employed people subtract from gross receipts when reporting net cash income. 2. A component of farm-sector income. Excludes income of contractors and landlords as well as the income of farms organized as nonfamily corporations or cooperatives, and farms run by a hired manager. Includes income of farms organized as proprietorships, partnerships, and family corporations. 3. Consistent with the CPS definition of self-employed income, reported depreciation expenses are subtracted from net cash farm income. The ARMS collects data on farm business depreciation used for tax purposes. 4. Wages paid to the operator are excluded because they are not shared among other households that have claims on farm business income. These wages are added to the operator household's adjusted farm business income to obtain farm self-employment income. 5. Gross rental income is excluded because net rental income from farm operation is added below to income received by the household. 6. More than one household may have a claim on the income of a farm business. On average, 1.1 households share the income of a farm business. 7. Includes net rental income from the farm business. Also includes net rental income from farmland held by household members that is not part of the farm business. In 1991 and 1992, gross rented income from the farm business was used because net rental income data were not collected. In 1993 and 1994, net rental income data were collected as part of off-farm income. 8. Wages paid to other operator household members by the farm business, and net income from a farm business other than the one surveyed. In 1996, also includes the value of commodities provided to household members for farm work. 9. Wages, salaries, net income from nonfarm businesses, interest, dividends, transfer payments, etc. In 1993 and 1994, also includes net rental income from farmland. 10. From the CPS. Sources: U.S. Department of Agriculture, Economic Research Service, 1991, 1992, 1993, 1994, and 1995 Farm Costs and Returns Survey (FCRS), and 1996 Agricultural Resource Management Study for farm operator household data. U.S. Department of Commerce, Bureau of the Census Current Population Survey (PCS), for average household income. *Information contact: Bob Hoppe (202) 694-5572 or e-mail rhoppe@econ.ag.gov*

Table 31—Balance Sheet of the U.S. Farming Sector_____

	Calendar year[1]									
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998

$ per operator household

Assets										
Real estate	600.8	620.0	625.6	642.8	678.3	712.4	761.3	805.4	852.9	895.6
Non-real estate	211.6	219.8	218.0	226.2	232.4	230.6	224.1	229.5	230.1	235.9
Livestock and poultry	66.2	70.9	68.1	71.0	72.8	67.9	57.8	60.1	58.5	59.0
Machinery and motor										
vehicles	21.9	21.5	20.7	22.7	23.2	23.1	27.2	30.6	28.0	29.0
Crops stored[2]	2.6	2.8	2.7	3.9	3.8	5.0	3.4	4.4	4.7	4.5
Purchased inputs	36.8	38.3	40.6	43.1	46.6	47.9	49.0	48.9	49.0	50.5
Financial assets	812.4	839.9	843.5	868.9	910.7	943.0	985.4	1,034.9	1,083.0	1,131.5
Liabilities										
Real estate debt[3]	76.0	74.7	74.9	75.4	76.3	78.0	79.6	81.9	84.1	86.5
Non-real estate debt[4]	61.9	63.2	64.3	63.6	65.9	69.1	71.5	74.2	78.1	81.2
Total farm debt	137.9	137.9	139.2	139.0	142.2	147.1	151.0	156.2	162.2	167.6
Total farm equity	674.5	701.9	704.3	729.9	768.5	795.9	834.3	878.7	920.8	963.8

Percent

Selected ratios										
Debt to assets	17.7	17.0	16.4	16.5	16.0	15.6	15.6	15.3	15.1	15.0
Debt to equity	21.6	20.4	19.6	19.8	19.0	18.5	18.5	18.1	17.8	17.6
Debt to net cash income	299	280	278	290	253	228	277	296	261	280

Values in the last two columns are forecasts. 1. As of December 31. 2. Non-CCC crops held on farms plus value above loan rates for crops held under CCC. 3. Excludes debt on operator dwellings, but includes CCC storage and drying facilities loans. 4. Excludes debt for nonfarm purposes. *Information contact: Dave Peacock (202) 694-5582*

Table 32—Cash Receipts from Farm Marketings, by State

Region and State	Livestock and products 1995	1996	Nov 1997	Dec 1997	Crops[1] 1995	1996	Nov 1997	Dec 1997	Total[1] 1995	1996	Nov 1997	Dec 1997
								$ million[2]				
NORTH ATLANTIC												
Maine	250	262	24	22	201	224	19	20	450	485	43	42
New Hampshire	63	72	7	6	86	89	9	6	149	161	16	12
Vermont	380	437	36	37	90	98	13	5	470	535	49	42
Massachusetts	99	109	9	9	336	369	77	45	436	478	86	54
Rhode Island	9	11	1	1	70	72	5	8	79	83	6	9
Connecticut	228	237	24	19	230	252	19	34	458	489	43	53
New York	1,852	2,045	164	166	1,006	998	92	88	2,859	3,043	256	254
New Jersey	196	196	16	17	577	605	60	37	773	801	77	54
Pennsylvania	2,553	2,865	222	241	1,216	1,278	144	117	3,769	4,143	366	358
NORTH CENTRAL												
Ohio	1,589	1,945	163	163	3,094	3,177	469	338	4,684	5,122	632	501
Indiana	1,759	1,895	167	172	3,428	3,663	681	295	5,187	5,558	848	467
Illinois	1,926	2,061	145	145	6,537	6,989	638	545	8,462	9,050	783	690
Michigan	1,343	1,448	117	116	2,283	2,195	351	235	3,626	3,643	468	351
Wisconsin	3,949	4,288	350	355	1,725	1,773	305	201	5,674	6,062	655	556
Minnesota	3,448	4,168	324	351	3,681	4,641	661	501	7,129	8,809	985	852
Iowa	5,022	5,457	372	476	6,234	7,396	728	501	11,256	12,853	1,099	977
Missouri	2,285	2,450	184	193	2,087	2,500	277	283	4,372	4,950	461	476
North Dakota	567	537	52	54	2,574	2,996	322	297	3,141	3,532	375	351
South Dakota	1,700	1,633	156	164	1,696	2,051	213	194		3,684	370	357
Nebraska	5,191	5,277	407	435	3,763	4,177	502	464	8,953	9,454	909	899
Kansas	4,536	4,570	345	405	3,035	3,299	358	396	7,572	7,869	703	801
SOUTHERN												
Delaware	517	573	35	39	162	184	20	9	679	757	55	47
Maryland	834	901	67	69	572	633	61	37	1,405	1,534	129	107
Virginia	1,393	1,478	122	123	838	900	113	82	2,230	2,378	235	205
West Virginia	312	308	25	23	79	80	7	9	391	388	32	32
North Carolina	3,726	4,427	353	297	3,165	3,404	419	243	6,891	7,831	773	540
South Carolina	613	737	62	57	816	865	77	61	1,430	1,602	139	117
Georgia	2,789	3,279	247	271	2,348	2,408	280	233	5,136	5,687	527	504
Florida	1,138	1,188	112	119	4,818	4,942	277	476	5,956	6,131	389	595
Kentucky	1,615	1,719	292	108	1,485	1,831	230	615	3,100	3,550	522	723
Tennessee	893	998	90	98	1,228	1,374	260	287	2,120	2,372	350	385
Alabama	2,167	2,363	162	155	705	811	84	79	2,872	3,174	246	234
Mississippi	1,686	1,934	142	150	1,448	1,529	260	242	3,134	3,463	402	393
Arkansas	3,022	3,357	233	244	2,068	2,530	457	270	5,090	5,887	690	514
Louisiana	630	687	55	65	1,383	1,655	268	270	2,013	2,342	323	335
Oklahoma	2,572	2,439	260	245	1,091	1,126	112	112	3,663	3,566	372	357
Texas	8,451	7,758	604	745	4,658	5,295	674	598	13,108	13,053	1,278	1,343
WESTERN												
Montana	796	797	78	65	1,074	1,230	131	143	1,870	2,027	209	208
Idaho	1,221	1,329	119	129	1,932	2,081	311	238	3,153	3,410	430	367
Wyoming	544	478	94	29	184	184	56	35	728	662	150	64
Colorado	2,743	2,759	234	295	1,414	1,470	171	155	4,156	4,229	405	450
New Mexico	961	1,197	119	132	498	512	73	57	1,458	1,709	192	190
Arizona	810	839	68	71	1,347	1,308	141	141	2,157	2,146	209	212
Utah	591	646	58	62	221	227	22	19	812	873	81	81
Nevada	164	153	10	11	118	133	12	11	282	286	23	22
Washington	1,583	1,664	148	140	3,631	4,017	362	311	5,215	5,681	511	451
Oregon	660	657	67	62	2,049	2,320	282	180	2,709	2,977	349	242
California	5,549	6,213	554	595	16,973	17,096	2,161	1,503	22,523	23,310	2,715	2,098
Alaska	6	6	1	1	24	23	2	2	30	29	3	2
Hawaii	72	66	6	5	423	417	34	34	494	483	40	39
UNITED STATES	87,004	92,914	7,705	7,954	100,700	109,425	13,303	11,062	187,704	202,339	21,008	19,015

1. Sales of farm products include receipts from commodities placed under nonrecourse CCC loans, plus additional gains realized on redemptions during the period. 2. Estimates as of end of current month. Totals may not add because of rounding. *Information contact: Roger Strickland (202) 694-5592. To receive current monthly cash receipts contact Larry Traub at (202) 694-5593 or ltraub@econ.ag.gov*

Table 33—Cash Receipts from Farming

| | Annual | | | 1996 | 1997 | | | | | |
	1995	1996	1997	Dec	Jul	Aug	Sep	Oct	Nov	Dec
					$ million					
Commodity sales*	187,704	202,339	201,822	18,611	14,886	15,394	17,194	22,240	21,008	19,015
Livestock and products	87,004	92,914	93,449	7,777	8,256	7,787	8,186	7,531	7,705	7,954
Meat animals	44,828	44,382	47,633	3,771	4,219	3,926	4,490	3,660	3,654	4,101
Dairy products	19,894	22,834	21,080	1,831	1,649	1,687	1,653	1,821	1,822	1,930
Poultry and eggs	19,069	22,326	21,362	1,947	1,877	1,914	1,748	1,816	1,809	1,694
Other	3,214	3,371	3,374	228	511	260	295	233	420	229
Crops	100,700	109,425	108,373	10,834	6,631	7,607	9,009	14,709	13,303	11,062
Food grains	10,417	11,550	10,610	896	1,421	989	1,021	881	659	840
Feed crops	24,282	28,114	25,851	2,762	1,082	1,801	1,789	2,935	3,442	2,624
Cotton (lint and seed)	6,851	7,461	6,914	1,355	106	240	257	1,079	1,497	1,216
Tobacco	2,548	2,796	3,072	615	79	381	579	579	290	782
Oil-bearing crops	15,466	17,756	19,518	1,516	762	786	1,002	4,500	2,374	1,664
Vegetables and melons	14,891	14,349	14,244	813	1,298	1,629	1,590	1,591	870	873
Fruits and tree nuts	11,074	11,714	12,169	1,273	979	886	1,336	1,598	1,833	1,334
Other	15,170	15,686	15,995	1,605	903	895	1,435	1,546	2,338	1,728
Government payments	7,253	7,281	7,460	522	26	37	2,958	1,598	34	739
Total	194,957	209,620	209,282	19,133	14,912	15,431	20,152	23,838	21,042	19,754

Values for the most recent year and monthly values for the current year are preliminary. *Sales of farm products include receipts from commodities placed under nonrecourse CCC loans, plus additional gains realized on redemptions during the period. *Information contact: Roger Strickland (202) 694-5592. To receive current monthly cash receipts, contact Larry Traub at (202)694-5593 or ltraub@econ.ag.gov*

Table 34—Farm Production Expenses

| | Calendar year | | | | | | | | | |
	1989	1990	1991	1992	1993	1994	1995	1996	1997 F	1998 F
					$ million					
Feed purchased	20,744	20,388	19,333	20,133	21,431	22,631	23,829	25,234	25,173	24,308
Livestock and poultry purchased	12,935	14,642	14,129	13,574	14,597	13,270	12,335	11,148	13,995	13,300
Seed purchased	4,397	4,519	5,113	4,913	5,165	5,376	5,463	6,112	6,391	6,325
Farm-origin inputs	38,076	39,548	38,575	38,620	41,194	41,277	41,628	42,495	45,560	43,934
Fertilizer and lime	8,174	8,206	8,666	8,331	8,398	9,180	10,033	10,934	10,824	10,892
Fuels and oils	4,772	5,790	5,607	5,298	5,350	5,312	5,448	5,736	5,664	5,628
Electricity	2,648	2,606	2,633	2,610	2,676	2,682	2,968	3,198	3,141	3,106
Pesticides	5,011	5,363	6,321	6,471	6,723	7,225	7,726	8,525	8,730	8,725
Manufactured inputs	20,605	21,965	23,228	22,710	23,147	24,398	26,175	28,393	28,359	28,352
Short-term interest	6,743	6,656	6,130	5,395	5,333	5,954	6,685	6,862	7,000	7,100
Real estate interest[1]	7,190	6,781	5,989	5,742	5,489	5,782	6,042	6,357	6,400	6,500
Total interest charges	13,933	13,437	12,119	11,138	10,822	11,735	12,726	13,218	13,400	13,600
Repair and maintenance[1]	8,407	8,554	8,632	8,471	9,193	9,083	9,458	10,304	10,656	10,834
Contract and hired labor	12,029	14,113	13,900	14,000	15,006	15,309	16,316	17,348	18,207	18,737
Machine hire and custom work	3,378	3,574	3,523	3,782	4,420	4,790	4,792	4,692	4,860	4,824
Marketing, storage, and transportation	4,207	4,211	4,719	4,541	5,648	6,821	7,180	6,818	7,193	7,155
Misc. operating expenses[1,2]	12,977	13,844	14,654	14,061	15,554	17,146	18,270	17,985	18,074	17,764
Other operating expenses	40,945	44,297	45,427	44,854	49,822	53,148	56,016	57,147	58,990	59,314
Capital consumption[1]	18,117	18,128	18,184	18,310	18,378	18,688	18,914	18,930	19,005	19,038
Taxes[1]	5,505	5,862	5,815	6,117	6,177	6,490	6,717	6,828	6,994	7,053
Net rent to nonoperator landlords	9,428	10,052	9,924	11,188	11,009	11,720	11,984	14,293	14,130	13,836
Other overhead expenses	33,050	34,042	33,923	35,614	35,564	36,898	37,615	40,050	40,129	39,927
Total production expenses	146,660	153,290	153,273	152,936	160,548	167,457	174,161	181,303	186,438	185,127

F = Forecast. 1. Includes operator dwellings. 2. Beginning in 1982, miscellaneous operating expenses include other livestock purchases, dairy assessments and feeding fees paid by nonoperators. Totals may not add because of rounding. *Information contact: Chris McGath (202) 694-5579, Dave Peacock (202) 694-5582*

Table 35—CCC Net Outlays by Commodity & Function

	Fiscal year									
	1990	1991	1992	1993	1994	1995	1996	1997	1998 E	1999 E
	$ million									
COMMODITY/PROGRAM										
Feed grains:										
Corn	2,435	2,387	2,105	5,143	625	2,090	2,021	2,587	2,648	2,577
Grain sorghum	349	243	190	410	130	153	261	284	286	280
Barley	-94	71	174	186	202	129	114	109	145	126
Oats	-5	12	32	16	5	19	8	8	9	8
Corn and oat products	8	9	9	10	10	1	0	0	0	0
Total feed grains	2,693	2,722	2,510	5,765	972	2,392	2,404	2,988	3,088	2,991
Wheat and products	796	2,805	1,719	2,185	1,729	803	1,491	1,332	1,556	1,468
Rice	667	867	715	887	836	814	499	459	519	471
Upland cotton	-79	382	1,443	2,239	1,539	99	685	561	859	878
Tobacco	-307	-143	29	235	693	-298	-496	-156	-183	-160
Dairy	505	839	232	253	158	4	-98	67	191	116
Soybeans	5	40	-29	109	-183	77	-65	5	10	22
Peanuts	1	48	41	-13	37	120	100	6	0	-1
Sugar	15	-20	-19	-35	-24	-3	-63	-34	-38	-39
Honey	47	19	17	22	0	-9	-14	-2	0	0
Wool	104	172	191	179	211	108	55	0	0	0
Operating expense[1]	618	625	6	6	6	6	6	6	5	6
Interest expenditure	632	745	532	129	-17	-1	140	-111	-56	-28
Export programs[2]	-34	733	1,459	2,193	1,950	1,361	-422	125	111	547
Disaster/tree/										
livestock assistance[3]	161	121	1,054	944	2,566	660	95	130	15	4
Conservation reserve program	0	0	0	0	0	0	7	105	297	346
Other conservation programs	647	155	-162	949	-137	-103	320	104	394	432
Total	6,471	10,110	9,738	16,047	10,336	6,030	4,646	7,256	8,566	8,747
Function										
Price support loans (net)	-399	418	584	2,065	527	-119	-951	110	-88	-119
Cash direct payments:[4]										
Production flexibility contract	0	0	0	0	0	0	5,141	6,320	5,719	5,512
Deficiency	4,178	6,224	5,491	8,607	4,391	4,008	567	-1,118	-13	0
Diversion	0	0	0	0	0	0	0	0	0	0
Dairy termination	189	96	2	0	0	0	0	0	0	0
Loan Deficiency	3	21	214	387	495	29	0	0	0	0
Other	0	0	140	149	171	97	95	7	203	250
Disaster	0	0	0	0	0	0	0	0	0	0
Conservation reserve program	0	0	0	0	0	0	2	1,671	1,798	1,694
Other conservation programs	0	0	0	0	0	0	0	85	244	303
Non-Insured Assistance (NAP)	0	0	0	0	0	0	2	52	69	80
Total direct payments	4,370	6,341	5,847	9,143	5,057	4,134	5,807	7,017	8,020	7,839
Crop disaster[3]	5	6	960	872	2,461	584	14	2	0	0
Emergency livestock/tree/										
forage assistance	156	115	94	72	105	76	81	128	15	4
Purchases (net)	-48	646	321	525	293	-51	-249	-60	129	74
Producer storage	185	1	14	9	12	23	0	0	0	0
payments										
Processing, storage, and										
transportation	278	240	185	136	112	72	51	33	33	34
Operating expense[1]	618	625	6	6	6	6	6	6	5	6
Interest expenditure	632	745	532	129	-17	-1	140	-111	-56	-28
Export programs[2]	-34	733	1,459	2,193	1,950	1,361	-422	125	111	547
Other	708	240	-264	897	-170	-55	169	6	397	390
Total	6,471	10,110	9,738	16,047	10,336	6,030	4,646	7,256	8,566	8,747

E = Estimated in the FY 1999 President's Budget which was released February 2, 1998 based on November 1997 supply and demand estimates.
The CCC outlays shown for 1996-1999 include the impact of the Federal Agriculture Improvement and Reform Act of 1996, which was enacted
April 4, 1996. Minus (-) indicates a net receipt (excess of repayments or other receipts over gross outlays of funds). 1. Does not include CCC
Transfers to General Sales Manager. 2. Includes Export Guarantee Program, Direct Export Credit Program, CCC Transfers to the General
Sales Manager, Market Promotion Program, starting in FY 1991 and starting in FY 1992 the Export Guarantee Program - Credit Reform,
Export Enhancement Program, Dairy Export Incentive Program, and Technical Assistance to Emerging Markets. 3. Approximately
$1.5 billion in benefits to farmers under the Disaster Assistance Act of 1989 were paid in generic certificates and were not recorded directly
as disaster assistance outlays. 4. Includes cash payments only. Excludes generic certificates in FY 86-96.
Information contact: Richard Pazdalski, Farm Services Agency-Budget at (202) 720-5148 or rpazdals@wdc.fsa.usda.gov

Food Expenditures

Table 36—Food Expenditures

	Annual			1997	1998		Year-to-date cumulative		
	1995	1996	1997 P	Dec P	Jan P	Feb P	Dec P	Jan P	Feb P
					$ billion				
Sales[1]									
At home[2]	354.2	367.6	380.2	35.6	31.5	25.9	380.2	31.5	57.4
Away from home[3]	280.8	288.5	297.9	24.9	23.6	22.1	297.9	23.6	45.7
					1995 $ billion				
Sales[1]									
At home[2]	367.3	367.4	371.0	34.5	30.2	25.0	371.0	30.2	55.2
Away from home[3]	287.7	288.5	289.7	23.9	22.7	21.1	289.2	22.4	44.4
			Percent change from year earlier ($ billion)						
Sales[1]									
At home[2]	3.8	3.8	3.4	3.8	4.8	-7.3	3.4	4.8	-1.0
Away from home[3]	4.5	2.7	3.0	1.4	3.9	-1.6	3.0	3.9	1.2
			Percent change from year earlier (1995 $ billion)						
Sales[1]									
At home[2]	0.5	0.1	1.0	2.8	2.8	-8.6	1.0	2.8	-2.7
Away from home[3]	2.2	0.3	0.2	-1.2	1.4	-4.1	0.2	1.4	-1.4

P = Preliminary. 1. Food only (excludes alcoholic beverages). Not seasonally adjusted. 2. Excludes donations and home production.
3. Excludes donations, child nutrition subsidies, and meals furnished to employees, patients, and inmates. *Information contact: Annette Clauson (202) 694-5373*
Note: This table differs from Personal Consumption Expenditures (PCE), table 2, for several reasons: (1) this series includes only food, excluding alcoholic beverages and pet food which are included in PCE; (2) this series is not seasonally adjusted, whereas PCE is seasonally adjusted at annual rates; (3) this series reports sales only, but PCE includes food produced and consumed on farms and food furnished to employees; (4) this series includes all sales of meals and snacks. PCE includes only purchases using personal funds, excluding business travel and entertainment. For a more complete discussion of the differences, see "Developing an Integrated Information System for the Food Sector," Agr. Econ. Rpt. No. 575, Aug. 1987.

Transportation

Table 37—Rail Rates; Grain & Fruit-Vegetable Shipments

	Annual			1997						1998
	1995	1996 R	1997 R	Jan	Aug	Sep R	Oct P	Nov P	Dec P	Jan P
Rail freight rate index[1] (Dec. 1984=100)										
All products	111.7	111.5	112.1	111.4	112.4	112.5	112.5	112.6	112.6	112.4
Farm products	115.6	115.9	119.9	117.5	121.1	121.1	121.1	121.1	122.3	122.2
Grain[6]	117.1	118.0	--	--	--	--	--	--	--	--
Food products	111.7	108.8	107.6	107.4	108.4	108.4	108.4	108.4	108.7	108.7
Barge freight rate index[1] (Dec 1990=100)										
Grain	172.6	129.5	107.1	122.2	93.9	113.3	162.5	119.7	105.0	95.7
Grain shipments										
Rail carloadings (1,000 cars)[2]	28.9	25.2	23.2	24.3	22.9	20.6	25.6	23.8	23.0	23.9
Barge shipments (mil. ton)[3,5]	3.5	3.1	2.4	1.6	2.9	2.2	0.0	0.9	--	2.0
Fresh fruit and vegetable shipments[4]										
Piggy back (mil. cwt)	1.3	1.1	1.1	0.9	0.8	0.9	0.7	0.9	0.8	1.0
Rail (mil. cwt)	1.9	1.6	1.7	2.4	0.9	0.9	1.3	1.6	1.7	1.5
Truck (mil. cwt)	40.5	35.7	42.6	39.1	39.6	36.2	39.5	39.9	38.6	38.8
Cost of operating trucks hauling produce[4]										
Fleet operation (cents/mile)	130.3	123.0	135.4	136.2	135.2	134.9	135.7	136.5	--	--

P= Preliminary. R = Revised. -- = Not available. 1. Department of Labor, Bureau of Labor Statistics. 2. Weekly average; from Association of American Railroads. 3. Shipments on Illinois and Mississippi waterways, U.S. Corps of Engineers. 4. Agricultural Marketing Service, USDA. 5. Annual 1996 is 7-month average. Annual data are calendar year. 6. Discontinued. *Information Contact: Genny Gonzales (202) 694-5296*

Indicators of Farm Productivity

Table 38—Indexes of Farm Production, Input Use, & Productivity[1]

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
					1992=100					
Farm output	89	87	88	82	89	94	94	100	94	105
All livestock products	89	90	91	94	94	95	98	100	101	105
Meat animals	93	94	95	97	97	97	99	100	100	103
Dairy products	94	95	94	96	95	98	98	100	99	101
Poultry and eggs	71	74	81	83	86	92	96	100	104	110
All crops	89	84	85	75	86	92	91	100	89	106
Feed crops	100	95	84	62	85	88	86	100	76	102
Food crops	95	83	84	76	83	107	82	100	96	96
Oil crops	96	89	88	72	88	87	94	100	85	115
Cotton and cotton seed	81	86	95	91	91	92	96	100	95	106
Tobacco	82	60	92	96	75	96	109	100	100	123
Vegetables and melons	81	82	89	81	84	92	97	100	94	106
Other crops	86	83	95	102	98	97	96	100	107	110
Farm input	109	102	102	109	103	103	105	100	95	96
Farm labor	107	104	100	100	102	101	100	100	98	99
Farm real estate	139	130	120	113	108	105	103	100	97	94
Durable equipment	98	91	102	102	101	100	101	100	100	103
Energy	109	126	106	97	94	97	98	100	111	109
Agricultural chemicals	84	83	91	80	92	90	100	100	99	104
Feed, seed, and purchased livestock	94	91	90	86	93	93	94	95	96	0
Other purchased inputs	108	104	102	98	92	97	100	100	104	99
Farm output per unit of input	84	85	87	82	90	93	93	100	94	104
Output per unit of labor										
Farm[2]	82	85	86	75	86	91	90	100	99	109
Nonfarm[3]	92	95	95	95	96	96	97	100	100	101

1. New data and methods were used to calculate the indexes, which have been revised back to 1948. 2. Economic Research Service.

3. Bureau of Labor Statistics. *Information contact: John Jones (202) 694-5614*

Food Supply & Use

Table 39—Per Capita Consumption of Major Food Commodities[1]

Commodity	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 P
					Lbs.					
Red meats[2,3,4]	117.4	119.5	115.9	112.3	111.9	114.1	112.1	114.7	114.7	112.0
Beef	69.6	68.6	65.4	64.0	63.1	62.8	61.5	63.6	64.0	64.2
Veal	1.3	1.1	1.0	0.9	0.8	0.8	0.8	0.8	0.8	1.0
Lamb & mutton	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8
Pork	45.6	48.8	48.4	46.4	46.9	49.5	48.9	49.5	49.0	46.0
Poultry[2,3,4]	51.0	51.9	53.9	56.3	58.3	60.8	62.5	63.3	62.9	64.3
Chicken	39.4	39.6	40.9	42.5	44.3	46.7	48.5	49.3	48.8	49.8
Turkey	11.6	12.4	13.1	13.8	14.1	14.1	14.0	14.1	14.1	14.6
Fish and shellfish[3]	16.1	15.1	15.6	15.0	14.8	14.7	14.9	15.1	14.9	14.7
Eggs[4]	32.7	31.8	30.5	30.2	30.1	30.3	30.4	30.6	30.2	30.4
Dairy products										
Cheese (excluding cottage)[2,5]	24.1	23.7	23.8	24.6	25.0	26.0	26.2	26.8	27.3	27.7
American	12.4	11.5	11.0	11.1	11.1	11.3	11.4	11.5	11.8	12.0
Italian	7.6	8.1	8.5	9.0	9.4	10.0	9.8	10.3	10.4	10.8
Other cheeses[6]	4.1	4.1	4.3	4.5	4.6	4.7	5.0	5.0	5.0	5.0
Cottage cheese	3.9	3.9	3.6	3.4	3.3	3.1	2.9	2.8	2.7	2.6
Beverage milks[2]	226.5	222.3	224.2	221.8	221.2	218.3	213.4	213.5	209.7	210.0
Fluid whole milk[7]	111.9	105.7	97.5	90.4	87.3	84.0	80.1	78.8	75.3	74.8
Fluid lowfat milk[8]	100.6	100.5	106.5	108.4	109.9	109.3	106.5	105.9	102.5	101.5
Fluid skim milk	14.0	16.1	20.2	22.9	23.9	25.0	26.7	28.7	31.9	33.7
Fluid cream products[9]	7.6	7.6	7.8	7.6	7.7	8.0	8.0	8.1	8.4	8.7
Yogurt (excluding frozen)	4.3	4.5	4.2	4.0	4.2	4.2	4.3	4.7	5.1	4.8
Ice cream	18.4	17.3	16.1	15.8	16.3	16.3	16.1	16.1	15.7	15.9
Ice milk	7.4	8.0	8.4	7.7	7.4	7.1	6.9	7.6	7.5	7.6
Frozen yogurt	--	--	2.0	2.8	3.5	3.1	3.5	3.5	3.5	2.7
All dairy products, milk										
equivalent, milkfat basis[10]	601.2	582.5	563.8	568.5	565.7	565.9	574.0	585.8	584.1	575.6
Fats and oils --total fat content	62.9	63.5	60.8	62.8	65.4	67.4	70.2	68.5	66.8	65.6
Butter and margarine (product weight)	15.2	14.8	14.6	15.3	15.0	15.4	15.8	14.7	13.7	13.4
Shortening	21.4	21.5	21.5	22.2	22.4	22.4	25.1	24.1	22.5	22.2
Lard and edible tallow (direct use)	2.7	2.6	2.1	2.4	3.1	4.1	3.9	4.7	4.9	5.3
Salad and cooking oils	25.4	26.3	24.4	24.8	26.7	27.2	26.8	26.2	26.8	26.0
Fresh fruits[11]	121.6	120.9	122.9	116.3	113.0	123.5	124.9	126.4	124.5	129.2
Canned fruit[12]	18.4	18.5	19.0	18.4	17.1	19.8	18.0	18.3	15.0	16.4
Dried Fruit	3.1	3.3	3.3	3.1	3.0	2.8	3.0	3.0	2.8	2.8
Frozen Fruit	3.6	3.4	3.7	3.5	3.5	3.8	3.4	2.9	4.2	3.9
Selected fruit juices[13]	72.8	68.3	70.5	66.2	66.6	63.6	74.9	71.6	75.6	75.5
Vegetables[11]										
Fresh	162.4	167.4	172.2	166.2	163.3	171.3	172.3	175.6	176.3	178.7
Canning	99.1	94.8	102.4	110.9	113.3	111.6	112.1	107.6	110.4	109.4
Freezing	67.0	64.2	67.6	70.5	72.8	71.6	76.7	81.4	78.2	83.3
Dehydrated and chips	29.9	29.3	29.9	31.8	32.6	32.1	33.0	31.6	31.2	32.9
Pulses	5.7	7.5	6.3	7.1	7.8	8.2	7.8	8.4	8.5	8.0
Peanuts (shelled)	6.4	6.9	7.0	6.0	6.5	6.2	6.0	5.8	5.7	5.7
Tree nuts (shelled	2.2	2.3	2.2	2.4	2.2	2.2	2.2	2.3	1.9	2.1
Flour and cereal products[14]	171.4	175.5	174.5	182.0	183.6	186.2	191.0	194.1	192.4	197.7
Wheat flour	129.8	132.7	133.1	137.0	138.0	141.2	144.4	147.3	149.8	152.0
Rice (milled basis)	14.0	14.3	15.2	16.3	16.8	17.5	17.6	19.3	20.1	18.8
Caloric sweeteners[15]	131.6	132.7	133.1	137.0	138.0	141.2	144.4	147.3	149.8	152.0
Coffee (green bean equiv.)	10.2	9.8	10.1	10.3	10.3	10.0	9.1	8.2	8.0	9.0
Cocoa (chocolate liquor equiv.)	3.8	3.8	4.0	4.3	4.6	4.6	4.3	3.9	3.6	--

-- = Not available. P = Preliminary. 1. In pounds, retail weight unless otherwise stated. Consumption normally represents total supply minus exports, nonfood use, and ending stocks. Calendar-year data except fresh citrus fruits, peanuts, tree nuts, and rice which are on crop-year basis. 2. Totals may not add due to rounding. 3. Boneless, trimmed weight. Chicken series revised to exclude amount of ready-to-cook chicken going to pet food as well as some water leakage that occurs when chicken is cut up before packaging. 4. Excludes shipments to the U.S. territories. 5. Whole and part-skim milk cheese. Natural equivalent of cheese and cheese products. 6. Includes Swiss, Brick, Muenster, cream, Neufchatel, Blue, Gorgonzola, Edam, and Gouda 7. Plain and flavored. 8. Plain and flavored and buttermilk. 9. Heavy cream, light cream, half and half, eggnog and sour cream and dip. 10. Includes condensed and evaporated milk and dry milk products. 11. Farm weight. 12. Excludes pineapples and berries. 13. Single strength equivalent. 14. Includes rye, corn, oat, and barley products. Excludes quantities used in alcoholic beverages, corn sweeteners, and fuel. 15. Dry weight equivalent.
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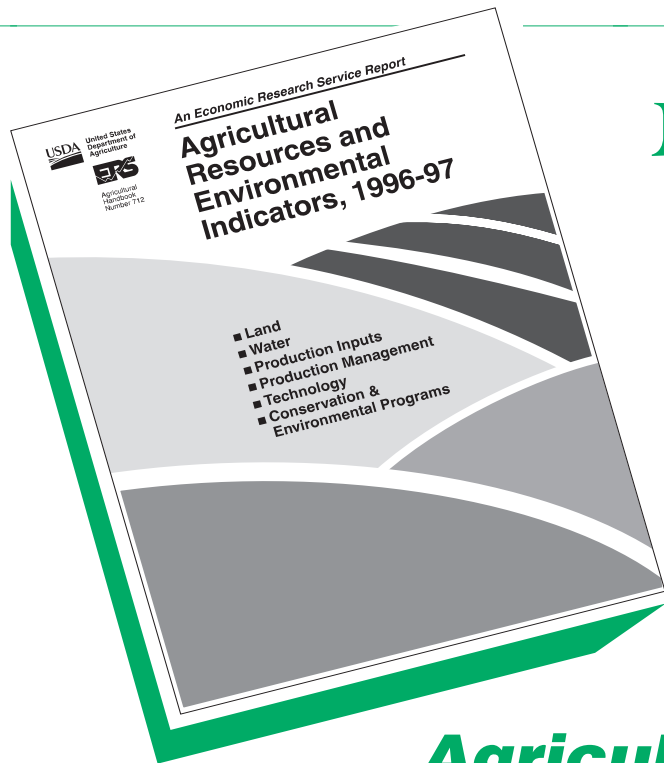
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