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Hog & Coffee Prices in Motion . . . Brazil's Currency Crisis . . . Risk Management Strategies. . . Biotechnology's Next Phase

Lower Output to Revive Hog Prices in 1999

In 1998, hog prices tumbled to the lowest annual average since 1972, \$31.67 per cwt—and the monthly average for December was \$14 per cwt, the lowest December average since 1963. Responding to the run of low returns in 1998, U.S. producers reduced their breeding herds late in the year. Based on market hog inventory, pig crops, and farrowing intentions reported in USDA's December *Hogs and Pigs* report, pork production in 1999 is expected to total about 18.9 billion pounds, down from last year overall (less than 1 percent), with a sharp decline in the final quarter. With receding slaughter levels, lower production, and continued increases in net exports, hog prices are expected to rebound from the extreme lows in late 1998, rising throughout 1999 from the mid-\$20's to near \$40 per cwt, and averaging in the mid-\$30's per cwt for the year.

Brazil's Financial Crisis & Potential Aftershocks

The intensifying financial crisis in Brazil, marked by a sharp devaluation of its currency in mid-January, has renewed concerns about the consequences for U.S. agriculture. Latin America and Asia together bought about 60 percent of U.S. agricultural exports last fiscal year, and Brazil's currency devaluation is already having repercussions in other countries in Latin America.

In the short run, Brazil's devaluation will have relatively little impact on U.S. agricultural trade with Brazil, though an expected reduction in U.S. agricultural exports and an increase in agricultural imports will likely widen the U.S. agricultural trade deficit with Brazil (\$684 million in fiscal year 1998). In the longer run, the potential for effects on U.S. agricultural trade is greater, particularly if Brazil is unable to regain financial control and if the continuing crisis forces other Latin American countries to take measures to stay competitive—such as devaluing currencies or raising import tariffs.



Coffee Exporters Count on Higher Earnings

Brazil and other coffee exporting countries are expecting a smaller 1999/2000 Brazilian crop to draw down world supplies and reverse the 1998/99 downturn in prices and foreign exchange earnings. Prices for arabica coffee, milder in taste than robusta—and the type most widely consumed in the U.S.—have been lower since last summer due to sharply higher 1998/99 production, particularly in Brazil, which accounts for about one-third of world output.

The fortunes of coffee exporters depend increasingly on supply management by producers, because importers have become less willing to hold stocks to buffer the price volatility. Traditionally, U.S., European, and Japanese importers reacted to declining coffee prices by building up stocks. In recent years, however, U.S. and other importers and roasters have moved toward just-in-time inventory to avoid carrying costs. Because of this, prices will vary more than in the past.

Value-Enhanced Crops: Biotechnology's Next Stage

Biotechnology's next quest, to provide field crops with value-enhanced qualities for end-users—output traits—is underway. Biotechnology's first stage featured crops with improved agronomic qualities—input traits—valued by farmers, such as resistance to pests. The industry now visualizes a system in which farmers grow crops designed for the specific needs of end-users in food manufacturing, the livestock sector, and even the pharmaceutical industry. Breaking with agriculture's traditional supply-side orientation may not be easy, however. Whether biotechnology's second stage is a wave or a modest ripple will hinge on several economic and technical factors.

Farmers Sharpen Tools To Confront Business Risks

Risk management involves finding the combination of strategies most likely to achieve a desired level of return at an acceptable level of risk. Three risks that concern farmers most, according to USDA's 1996 Agricultural Resource Management Study, are uncertainty regarding commodity prices, declines in crop yields or livestock production, and changes in government law and regulation.

Farmers have a variety of tools for cutting risk, such as diversification of production across multiple enterprises, entering into production and/or marketing contracts, and keeping extra cash on hand for emergencies. Other strategies include crop or revenue insurance, futures market trading, and off-farm employment. When individual efforts to deal with financial stress fail and large numbers of farms face significant financial loss, the Federal government has stepped in to assist farmers with direct payments, loans, and other types of support. Most recently, the 1999 Agricultural Appropriations Act provided for \$2.375 billion of emergency financial aid to farmers. Since farm business characteristics vary widely and operators' risk preferences differ, there can be no "one size fits all" approach to risk management.

Briefs

Livestock, Dairy, & Poultry

Lower Output to Revive Hog Prices In 1999

In 1998, hog prices tumbled to the lowest annual average since 1972, \$31.67 per cwt—and the monthly average for December was \$14 per cwt, the lowest December monthly average since 1963. Although feed costs were sharply below a year earlier, the extremely low prices slashed producers' returns.

The steep decline began in late 1997. Earlier in the year, producers had been anticipating sharply increased export demand from Asia following the outbreak of foot-and-mouth disease in Taiwan in March 1997 (*AO* March 1998). At that point, hog supplies were relatively tight, well below estimated slaughter capacity, and feed costs were declining. In response, producers took steps to expand production, increasing their breeding herds and setting in motion a process that would reach fruition beginning in late 1997 to early 1998, at the end of the approximately 10-month biological cycle (from breeding until the pigs produced reach slaughter weight). By July, prices had reached a monthly high of \$59 per cwt.

In late 1997, however, the effects of the deepening Asian financial crisis had begun to affect export demand. Although exports continued to increase in 1998—rising an estimated 20 percent for the year—they were concentrated in lower value cuts. Meanwhile, the expanded production began to increase the supply of hogs substantially—by September 1998, there were 63.5 million hogs on U.S. farms, the highest number since 1980. Productivity increases in pigs per litter and litters per sow, as well as in weight of slaughtered animals, added to the magnitude of expansion, as did recent increases in the number of hog operations with 2,000 or more head, which have seen the greatest productivity gains.

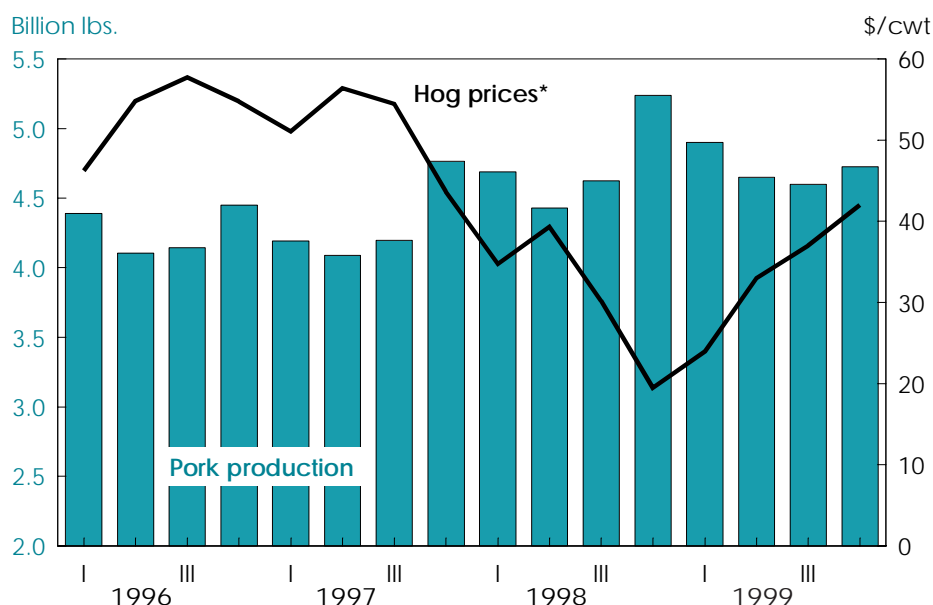
The unusually large increase in hog supplies strained the capacities of hog slaughter plants—weekly slaughter in the fourth quarter of 1998 frequently reached 2.2 million head, compared with a weekly level of only

about 1.65 million head in mid-1997. As slaughter plants exceeded their capacity, packers turned to overtime labor to handle the huge supply, pushing up costs. Increased slaughter costs for packers, who were tied to contracts or purchasing arrangements for a large share of their supply, were quickly

reflected in lower bid prices for hogs offered on the spot, or cash, market.

Adding further stress to an already strained system, increased shipments of Canadian hogs began to flow to U.S. packers just as the U.S. hog supply had outstripped plant capacity. The strong U.S. dollar, increased production and low prices in Canada, and labor problems at some Canadian packing plants led to an increase of nearly 1 million head in hog imports in 1998 compared with 1997.

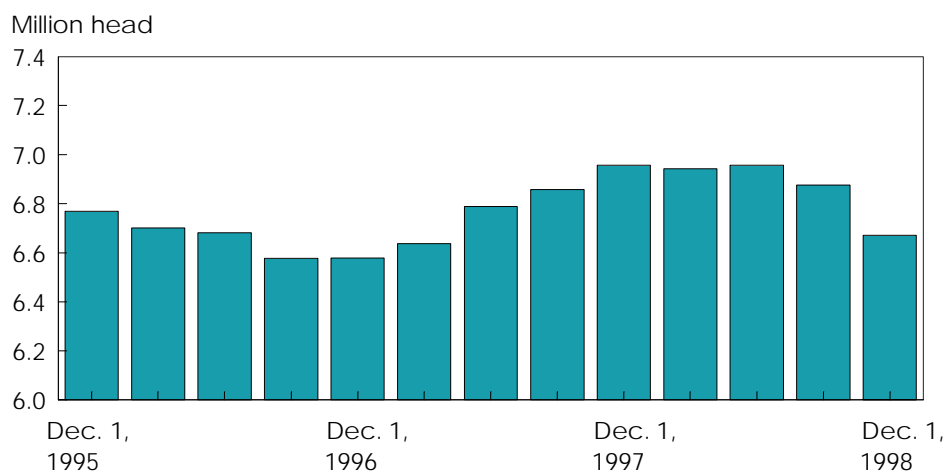
Hog Prices to Rebound in 1999 . . .



1999 forecasts.

*Barrow and gilt prices, Iowa and southern Minnesota.

. . . Following Reductions in the Breeding Herd



Economic Research Service, USDA

Responding to the run of low returns in 1998, U.S. producers reduced their breeding herds late in the year. USDA's December *Hogs and Pigs* report indicated a December 1 breeding inventory 4 percent below a year earlier, the first reduction in the quarterly year-over-year breeding inventory since March 1997. The reduction points to a smaller first-half 1999 pig crop and lower pork production in the second half of 1999.

Based on market hog inventory, pig crops, and farrowing intentions reported in the December *Hogs and Pigs* report, pork production in 1999 is expected to total about 18.9 billion pounds, down less than 1 percent from last year overall. Although production is expected to increase about 5 percent in first-half 1999, it will decline in the remainder of the year—fourth-quarter 1999 production is expected to be about 10 percent below a year earlier.

With receding slaughter levels, lower production, and continued increases in net exports, hog prices are expected to rebound from the extreme lows of \$19.48 per cwt of late 1998, rising throughout 1999 from the mid-\$20's to near \$40 per cwt, and averaging in the mid-\$30's per cwt for the year. Although poultry production is expected to rise 5-6 percent, beef production is expected to drop 2-3 percent in second-half 1999, reducing competition for pork. With a continuing decline in feed costs expected, producers' returns may rise above breakeven late in the year. The severe financial distress hog producers experienced in 1998, however, may slow their response to favorable returns—it may take longer than the typical 3-6 months of positive returns before producers resume herd expansion.

In contrast to the historical drop of 38 percent for hog prices on the market in 1998, retail pork prices declined less than 5 percent. Farmers' share of retail prices fell to 22 percent for the year, and was only 10 percent in December as the farm-to-retail spread widened to more than \$2 a pound. A low farm share of retail value with a lengthy adjustment period is typical when livestock prices drop sharply, although the drop to 10 percent that occurred in December was unusually steep. Retail prices in 1999 are expected to continue a downward adjustment to the

lower hog prices, declining another 2-4 percent, with the sharper drops expected early in the year. As hog prices rise in 1999, retail declines will taper off with a 1-percent decline in fourth-quarter 1999.

Retailers contend that the retail prices used in the farm-to-retail price spreads, which include data from the Consumer Price Index, do not accurately reflect large volumes of pork moving at sale prices. In their view, if these lower priced sales were included in the calculation, the spread would not appear as wide. At the same time, retail pricing responds to consumer demand for pork, not to the supply of hogs. Consumer incomes are strong, and demand for pork has held steady without the need for significant price reductions. As preferences for pork increase in response to higher quality, improved consistency, and larger cut size, pork supplies have not outstripped rising retail demand at current prices.

Continuing moderate domestic pork prices will help support U.S. exports in 1999. U.S. pork exports are expected to increase 10 percent in 1999, compared with a likely 20-percent rise in 1998. The 1998 increase was the result of lower U.S. pork prices and a volume increase of lower valued products; in 1999, as supplies stabilize, increased exports will bid up prices. A double-digit increase, however, will be contingent on successful delivery of food aid to Russia. Japan, Russia, Mexico, and Canada have accounted for three-fourths of all U.S. pork exports in 1998, and Japan, Mexico, and Canada will likely account for most of U.S. pork exports in 1999.

Japan's imports in 1999 are expected to increase moderately in line with a stronger yen. While the double-digit economic growth rates seen earlier in the decade are not likely in 1999, the U.S. share of Japanese pork imports is expected to remain near 30 percent. The U.S. provides more than 70 percent of the fresh pork and more than 15 percent of frozen pork imported by Japan. Denmark is the major U.S. competitor for frozen pork imports to Japan, supplying more than 33 percent of the frozen market. After the outbreak of foot-and-mouth disease in Taiwan in 1997, Japan compensated for the loss of imports from Taiwan

by diversifying its imports of fresh pork, adding cuts from Canada and South Korea. Canada is likely to provide the U.S. strong long-term competition for Japan's fresh pork market.

The moderation of economic growth in Mexico, together with continued recovery of its pork production industry, could slow Mexican demand for U.S. pork products in 1999. While export growth to Mexico may not meet the recent 2-year average growth rate of 60 percent, U.S. shipments to Mexico in 1999 are likely to continue increasing at a double-digit rate.

Exports to Canada in 1999 are likely to continue at the high levels reached following the dramatic increases of 1996-97. Strong Canadian demand for U.S. products reflects, in part, Canadian consumer demand for cuts that Canadian processors have been exporting in order to develop markets in Asia. As restructuring and expansion of the Canadian pork industry continues, demand for U.S. products could trend downward. On the import side, shipments of Canadian hogs could moderate in 1999, as slaughter capacity increases in Manitoba and as Ontario hogs increasingly move to plants in Quebec under buying contracts. **AO**

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Upcoming Reports—USDA's Economic Research Service

The following reports will be issued electronically on dates and at times (ET) indicated.

March

- 5 Aquaculture (3 p.m.)
- 11 World Agriculture Supply and Demand Estimates (8:30 a.m.)
- 12 Cotton and Wool Outlook (4 p.m.)**
- Oil Crops Outlook (4 p.m.)**
- Rice Outlook (4 p.m.)**
- 15 Feed Outlook (9:00 a.m.)**
- 19 Agricultural Outlook*
- 22 U.S. Agricultural Trade Update (3 p.m.)
- 23 Livestock, Dairy, and Poultry (4 p.m.)**
- 25 Fruit and Tree Nuts (3 p.m.)*
- 26 Wheat Yearbook*

*Release of summary, 3 p.m.

**Available electronically only

Briefs

Trade Policy

U.S. Export Programs Target Weak Global Demand

The U.S. government operates several types of programs to encourage U.S. agricultural exports and to feed needy people in foreign countries. Export credit guarantees, export price subsidies, and market promotion programs have facilitated commercial exports during this decade. U.S. food assistance programs donate agricultural products directly to individual countries with food aid needs or through the United Nations (UN) World Food Program, and permit long-term credit sales of agricultural commodities to countries on a government-to-government basis and to nongovernmental organizations in recipient countries.

U.S. agricultural exports rose steadily through the 1990's, reaching \$59.9 billion in fiscal year 1996. But as financial problems in Asian countries and in the former Soviet republics weakened world demand and as global commodity supplies increased in response to high prices in the mid-1990's, U.S. exports slipped to \$53.7 billion in fiscal 1998. Weak global demand is expected to continue in the short term and, coupled with large world commodity supplies and a strong U.S. dollar, is expected to lower U.S. agricultural exports to a forecast \$49 billion in fiscal 1999.

Export credit guarantees facilitate exports to buyers in countries where credit is necessary to maintain or increase U.S. sales, but where financing may not be available without U.S. government guarantees. The *Export Credit Guarantee Program* (GSM-102), the largest of the group, guarantees loans of more than 6 months to 3 years, and the much smaller *Intermediate Export Credit Guarantee Program* (GSM-103) guarantees loans of more than 3 years up to 7 years. Smaller credit guarantee programs—the *Supplier Credit Guarantee* and *Facilities Guarantee Programs*—were implemented only recently. USDA's Commodity Credit Corporation (CCC) approvals of export credit guarantees slid to \$2.9 billion in 1997, down from a peak of \$5.7 billion in fiscal year 1992, but rose again in 1998 to

\$4 billion as importers, particularly in Asia, sought government-guaranteed commercial loans to purchase U.S. products. Export credit guarantee shipments accounted for 6 percent of U.S. agricultural exports in 1998, down from 13 percent in 1992 when the export level was much lower.

The chief importers using U.S. export credit guarantee programs in 1998 were the Republic of South Korea, Mexico and, to a lesser extent, Turkey, Pakistan and Indonesia. Mexico has been one of the largest users of the credit guarantee programs throughout the past decade, but South Korea had reduced its program imports in the 1990's, and other major importers of the early 1990's such as Algeria, Iraq and the former Soviet Union sharply reduced their program purchases or no longer participate in the U.S. export credit guarantee programs.

USDA's **export market promotion programs**—the *Market Access Program* (MAP) and the *Foreign Market Development (Cooperator) Program*—currently are funded at about \$120 million, a drop of over \$100 million from their peak 1993 program level. Both programs, partnerships between USDA and private sector organizations, help develop markets for U.S. agricultural exports. Historically, 80 percent of MAP funding has helped build global markets for high-value products.

USDA runs two **export subsidy programs**—the *Export Enhancement Program* (EEP) and the *Dairy Export Incentive Program* (DEIP). The EEP, initiated in May 1985, awards cash payments on a bid basis to exporters, enabling them to sell certain commodities to specified countries at competitive prices. From 1986 through June of 1995, the EEP was associated with over half of U.S. wheat exports and, to a lesser extent, barley, wheat flour, and other commodity exports. Since July 1995, EEP has assisted only a few sales of barley and frozen poultry. The DEIP, the most active

export subsidy program today, awarded \$110 million in export bonuses (direct export subsidies) to U.S. exporters in 1998 for sales of selected dairy products—butter, butter oil, cheese, and milk powder.

The Uruguay Round Agreement on Agriculture (URAA), completed in 1994, imposed meaningful disciplines on agricultural export subsidies for the first time. In the 1996 Farm Act, Congress further reduced funding for the EEP, but supported funding for the DEIP at levels allowed under the URAA for U.S. dairy export subsidies. Reduced U.S. export subsidy spending from 1996 through 1999 also reflects minimal program activity following high world grain prices in 1996 and 1997.

The U.S. provides **food assistance** to needy populations overseas through *Public Law 480 (Food for Peace) Titles I, II and III* and through *section 416(b) of the Agricultural Act of 1949, as amended*, and the *Food for Progress Program*. Title I of P.L. 480 finances sales of commodities under long-term credit arrangements (up to 30 years) to developing countries with insufficient foreign exchange. Donations for emergency food relief and nonemergency humanitarian assistance are provided under Title II to international organizations such as the UN's World Food Program and to recipient governments. Title III grants food assistance to support development programs in least developed countries. Section 416(b) provides for donations of CCC-owned surplus commodities to developing countries, and Food for Progress authorizes the donation or sale of food aid commodities to assist developing countries that are implementing market-oriented policy reform.

Funding for the chief U.S. food assistance programs under Public Law 480 declined in the mid-1990's due to budget considerations, but allocations turned up slightly in 1998 to \$1.14 billion. The President announced a separate food aid initiative for wheat in July 1998 as global food aid needs rose and supplies of U.S. wheat and other commodities mounted. Under this initiative, 5 million metric tons of wheat and wheat products will be made available for donation overseas. The wheat and

wheat products are being purchased by the CCC under its surplus removal authority and donated under section 416(b).

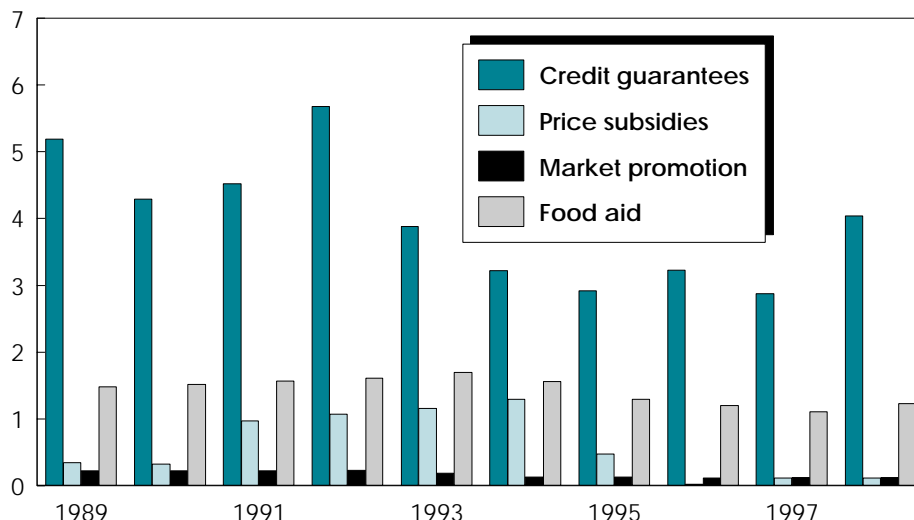
As of January 26, 1999, 4.8 million tons of wheat had been allocated under section 416(b) authority. Of the total, 3.33 million tons of wheat and wheat products will be made available to 19 countries in government-to-government donations. One million tons of wheat and wheat products will go to the UN's World Food Program, and 426,741 tons have been made available to private voluntary organizations for projects in the New Independent States (NIS) and in Bosnia, Central American and Caribbean countries, Indonesia, and Kenya.

About 1.5 million metric tons of wheat and wheat products from the President's July 1998 initiative are being provided to Russia as part of a larger food assistance package. The food assistance package for the Russian Federation, announced on November 6, 1998, includes assistance that will be provided through Title I concessional financing and Food for Progress grant agreements. Commodity allocations for Russia under P.L. 480 Title I long-term credit and Food for Progress include: beef, corn, lentils, nonfat dry milk, planting seeds, pork, poultry, rice, salmon, soybeans, soybean meal, vegetable oil, and wheat. In addition, nonfat dry milk will be donated from CCC inventories under section 416(b), and wheat and wheat flour will be donated under the President's Food Aid Initiative.

Other agricultural exporters also donated food to Russia, Indonesia, and other needy countries in 1998 and 1999. The European Union (EU) and Russia signed an agreement for a \$500-million food aid package for Russia on January 20, 1999.

Use of Ag Export Credit Guarantees Turns Up After Declining in Mid-1990's

\$ billion



Credit guarantees—GSM-102 and GSM-103 approvals; price subsidy awards—EEP/DEIP/COAP/SOAP; market promotion—Cooperator program expenditures and TEA/MPP/MAP allocations; food aid expenditures—P.L. 480 Titles I-III, excluding Section 416(b) shipments.

Economic Research Service, USDA

In October 1998, Canada announced it would provide \$1.8 million in humanitarian assistance to Russia.

The UN Food and Agriculture Organization (FAO) estimates that food aid shipments of grain from all donors will increase sharply in the 1998/99 international grain marketing year (July-June). FAO projects that grain aid shipments to Asian countries will nearly double from 1997/98 due to increased grain shipments to Indonesia, and estimates grain aid shipments of 1.4 million tons to Russia and other NIS, a sevenfold increase from 1997/98. Grain shipments to needy populations in Africa will remain the same as in 1997/98, while shipments to Latin American and Caribbean countries will

double to an estimated 600,000 tons following Hurricane Mitch.

Funding for U.S. international food assistance and export credit guarantee programs will continue at higher levels in 1999 to address ongoing financial problems in Asia and Russia, but U.S. funding for food assistance likely will drop back in 2000, and U.S. credit guarantee approvals are projected down slightly in 2000. Government funding for cost-share programs to promote U.S. products abroad is projected to be stable, while funding for export subsidy programs will likely continue below URAA export subsidy commitments.

The U.S. and other exporting nations will likely review export subsidies, food assistance, and export credit guarantees as they prepare for the next round of trade talks for the World Trade Organization. For example, the Cairns Group (Argentina, Australia, and others) and the U.S. advocate elimination of direct export subsidies, which currently are used primarily by the EU. **AO**

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FOR MORE ON WHEAT EXPORT PROGRAMS

With rising U.S. food aid shipments in 1999, total U.S. export program shipments could amount to more than 40 percent of U.S. wheat exports in fiscal 1999. Although export programs facilitated over 70 percent of U.S. wheat exports from 1986 through 1995, the share had dropped to 25 percent in the last 3 years.

See the special article in the next *Wheat Situation and Outlook Yearbook*. Summary will be released March 26, 1999. Summary and full report will be available at <http://usda.mannlib.cornell.edu/reports/erssor/field/whs-bby/>

Commodity Spotlight



John Love

Coffee Exporters Counting on Improved Earnings in 1999/2000

Brazil and other coffee-exporting countries are expecting a smaller 1999/2000 Brazilian crop to draw down world supplies, boost prices, and reverse the 1998/99 downturn in prices and foreign exchange earnings. The value of world coffee exports in 1998/99 is heading down to \$11 billion, off 10 percent from 1997/98, after rising to \$14 billion in 1996/97 from \$6 billion in 1992/93. While export volume is expected to increase in 1998/99, sharply lower prices will reduce the value (*AO* August 1998).

Producers in Central America and Africa, where coffee exports are critical to national economies, have been hard hit by the drop in revenue. The loss in export revenue is particularly threatening when the global economy is on shaky footing, and producers are seeking improvements in coffee productivity, national infrastructure, and world-wide consumption.

The world coffee crop in 1998/99 (July-June) is estimated at 106.8 million bags (60 kg or 132 pounds each), up 9 percent from 1997/98. Brazil accounts for about one-third of world output. Prices for arabica coffee—milder in taste than robusta and the type most widely consumed in the U.S.—have been lower since last summer due to sharply higher 1998/99

production, particularly in Brazil. Prices for robusta varieties—used primarily in soluble coffee, known to consumers as instant—have strengthened because severe drought cut production in Asia. During January-June 1999, world prices for arabica coffees are expected to average 30 percent below a year earlier, more than offsetting an expected 5-percent increase in robusta prices.

These lower prices for green (unroasted) coffee are being passed along to U.S. consumers. U.S. retail prices for roasted coffee fell 20 percent during fall 1998, compared with a year earlier. As large Brazilian supplies continue downward pressure on world prices, U.S. retail prices for roasted coffee are expected to average around \$3.50 a pound in January-June 1999, about 10-15 percent below a year earlier. Continued strong robusta prices, however, are expected to keep U.S. instant prices for January-June 1999 at around \$10.50 to \$10.75 a pound, slightly above a year earlier.

Converting Coffee Beans Into Foreign Exchange

Coffee is one of the world's most highly traded commodities; forecast world exports of 80 million bags in 1998/99

represent 75 percent of world coffee production. Exports represent a much smaller share of global production for other commodities—only 30 percent of sugar, 20 percent of wheat and oilseeds, 10 percent of coarse grains, and 5 percent of rice production is exported. Coffee production is regionally concentrated while demand is worldwide, and in the largest consuming markets—the U.S., Germany, France, and Japan, which together consume half of world exports—coffee production is negligible. Coffee prices, which average \$3,000 a ton, put it near the top in terms of total export value, along with soybeans, corn, wine, and cheese.

Coffee consumption is increasing at roughly the rate of population growth worldwide. Emerging markets in Eastern Europe and Russia accounted for much of the recent growth in world coffee demand, however, as total consumption has been flat in the major Northern Hemisphere markets. And while consumption is fairly stable, production varies 5-10 percent annually and market prices fluctuate widely. Average world prices for green coffee slumped to 55 cents a pound in 1991/92, rose to \$1.50 in 1994/95, and will likely wind up near \$1 in 1998/99.

Across all producers, coffee accounted for a steady 3 percent of export earnings in the 1990's. Coffee accounts for 5 percent of Brazil's export earnings, but for Colombia the share is 20 percent. Coffee also contributes 20-30 percent of total export earnings for the Central American countries of Guatemala, Honduras, Nicaragua, El Salvador, and Costa Rica. African and South American coffee producing countries overall earn 5 percent of their export revenue from coffee. Coffee is less important to Asia overall, but Vietnam's exports have contributed a growing share of its export earnings, rising from 2 percent to nearly 15 percent in the last 6 years.

Large coffee supplies and loss in coffee export revenue in 1998/99 are testing the resolve of the Association of Coffee Producing Countries (ACPC) to maintain export earnings by managing world supplies. The ACPC, formed in 1993, comprises 13 countries and accounts for 75 percent of world coffee exports. ACPC members attempt to mitigate large swings in world coffee prices by agreeing to limit

Commodity Spotlight

exports, but the organization has no mechanism to enforce the limits.

The strategy of holding back supplies to raise prices is generally beneficial to producers in a market with fairly inelastic demand, where a curtailment of quantity sold brings a proportionately greater increase in price, which pushes up total revenue. Nevertheless, such cartel-like activity is difficult to maintain, since members may be tempted to increase sales to take advantage of the higher prices, thereby undermining the strategy.

Brazil's export limit for 1998/99 was initially set at 15 million bags, the same as a year earlier. The Brazilian government has offered loans with favorable terms to encourage producers to hold stocks, and prospects for a lower 1999/2000 crop and higher prices are also encouraging growers to refrain from rushing coffee to the market. But even under these circumstances, the mid-January currency devaluation and ensuing financial difficulties are expected to push exports to more than 19 million bags.

Coffee yields vary widely, depending on climate, growing conditions, coffee type, and management skills. On average, an acre yields about 4 bags of coffee, although up to 8-10 bags are attained in some Central American countries. Producers can increase productivity by planting trees with increased cold-hardiness and drought resistance at higher per-acre densities, by irrigating and fertilizing with drip tubes, and by harvesting and processing higher quality, uniformly ripened beans.

An average 4-bag yield earns \$400 to \$800 an acre, while specialty coffees from Central America earn \$1,500 to \$3,000 an acre. Coffee grown in Jamaica's famed Blue Mountain region earns up to seven times the world average.

Coffee losses to the vagaries of weather—freezes, droughts, hurricanes—can be devastating to economies dependent on coffee exports. In 1998, Hurricane Georges and Tropical Storm Mitch caused widespread destruction in Central America. Preliminary estimates of losses from these two storms of 750,000-1 million bags equate to around \$100 million in value. Coffee was lost directly to rains

Brazil Is the World's Largest Coffee Producer

	1993/94	94/95	95/96	96/97	97/98	98/99
<i>Million bags</i>						
Brazil	28.5	28.0	16.8	28.0	23.5	35.6
Colombia	11.4	13.0	12.9	10.8	11.9	12.5
Central America*	10.9	11.5	12.2	12.3	12.7	10.1
Africa	14.6	17.1	17.5	20.4	17.0	17.2
Asia	16.9	16.7	17.3	20.7	21.5	20.3
Other	10.0	10.9	12.1	11.5	11.0	11.2
Total	92.3	97.1	88.7	103.7	97.7	106.8

July-June crop year. Bag = 60 kg. 1998/99 forecast.

*Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

Source: Foreign Agricultural Service, USDA

Economic Research Service, USDA

and high winds, as well as indirectly with the destruction of roads and bridges necessary for access and transportation. The coffee economy will not fully recover until roads in Honduras and Nicaragua are rebuilt, which will take several years.

The recent earthquake in Colombia apparently did not seriously affect the coffee crop, but some drying sheds were damaged. The industry reportedly avoided serious damage because processing facilities are dispersed throughout the country, so not all were affected.

Initiatives by the governments of a number of coffee-exporting countries reflect the importance of coffee to their economies. In Colombia, improvements to the "coffee highway" connecting primary producing areas have been proposed, although opposition to erecting toll booths to pay for the project has been encountered. In Kenya and Venezuela, governments have announced intentions to encourage coffee plantings following a dropoff in oil export revenues. In Brazil, government loans are supporting harvest wages and good orchard maintenance for growers willing to postpone sales until market prices pick up again. Brazil's loan program shows the government's resolve to support the coffee economy, despite pressure to cut government spending.

For all countries, financing these programs is more difficult when export revenues are dropping, since funding is linked to the very revenues the programs are supposed to help generate. Also, such programs generally increase world supplies of coffee, which leads to lower prices.

Coffee Prices: How Volatile?

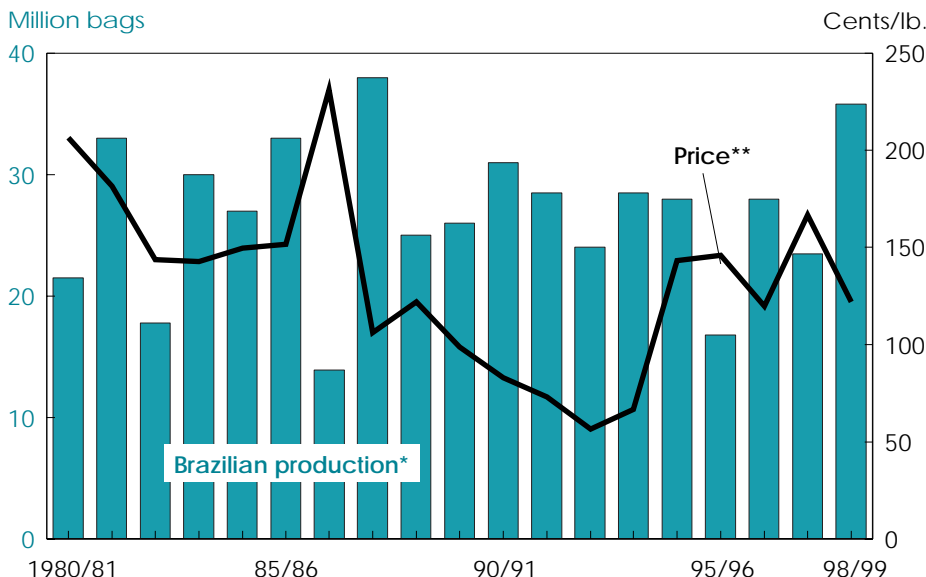
Coffee prices are among the most volatile in world commodity trading, historically more volatile than prices for crude oil, gold, sugar, cocoa, corn, and soybeans. However, coffee prices have declined less than prices for other commodities in recent months in the face of devaluing currencies, bountiful supplies, and weak demand. Coffee's major markets, in relatively strong economies of North America and Western Europe, have fared better than markets in Asia and East Europe.

World coffee prices swing as producer- and importer-held stocks rise and fall. Stock levels reflect fluctuations in production driven largely by crop cycles and weather. During the early 1990's, a relatively calm period for the coffee market, producer stocks ranged from 40 million to 50 million bags, around 50 percent of total use. Since 1994/95, producer stocks have trended down toward 25 percent of use, while importers' stocks have declined even more sharply. As a result, price volatility has increased.

The fortunes of coffee exporters depend increasingly on supply management by producers, because importers have become less willing to hold stocks to buffer the price volatility. Traditionally, U.S., European, and Japanese importers could react to increased coffee prices by using up stocks. In recent years, however, U.S. and other importers and roasters have moved toward just-in-time inventory to avoid carrying costs. When supplies tighten in one region because of smaller crops, importers turn to other regions to satisfy roaster demand. Because of low

Commodity Spotlight

Coffee Production Levels Tend to Alternate



July-June crop year. Bag = 60 kg. 1998/99 forecast.

*All coffee varieties. **New York spot prices for Brazilian arabica coffee.

Economic Research Service, USDA

importer stocks, as world supplies tighten, prices can be expected to increase proportionately more than supplies decrease, and export earnings will increase—at the expense of coffee consumers. The higher costs of green coffee are passed on through higher prices for roasted beans. Conversely, a rebound in coffee production will depress prices and lead to lower export earnings, unless stocks can be held—at exporter expense.

The U.S. is the largest single-country consumer of coffee, importing \$3.6 billion of coffee last year. As world prices for green coffee soared to \$2 a pound in late 1994, U.S. imports dropped to 15 million bags—the lowest total in the 1990's (40 May 1995). U.S. inventories, which had risen to over 10 million bags, were drawn down to 2 million bags, while monthly roastings stayed near 1.5 million bags. By late 1998, green coffee stocks had decreased to nearly 1 million bags as roasters counted on plentiful supplies readily available from South America. In the past few months, U.S. stocks have increased due to attractive prices and talk of a smaller upcoming world supply.

U.S. retail coffee prices follow the prices for imported coffee fairly closely. For example, during July-December 1998

world prices for green coffee averaged \$1 a pound—30 cents below a year earlier, and retail prices for roasted coffee averaged \$3.62 cents a pound—84 cents below a year earlier. Thus, both markets showed a similar percentage decrease.

Prospects for Brazil's Crop In 1999/2000

Forecasts by private analysts and Brazilian government officials indicate the 1999/2000 coffee crop will be much smaller than USDA's 1998/99 estimate of 35.6 million bags. These forecasts anticipate a drop of about 10 million bags, or 30 percent. Brazilian coffee production can be projected within a range of 5 million bags, taking into account the biennial bearing pattern (expected year-to-year yield fluctuations caused by biological competition between fruiting and branch growth) along with measures of capacity, incentives to maintain yields, and occasional damage from freezes and droughts. However, more precise forecasts are possible only with direct observation of coffee flowering and fruit development.

In the 1990's, Brazil has produced an average of 26 million bags, ranging from 17 million to 36 million. Brazil's off-year crops average 5 million bags less than

on-years. The drop can be greater in years of freeze, drought, and/or excessive stress from an above-average on-year crop.

Over the last 100 years, Brazil has experienced 24 moderate-to-severe freezes, which occur mostly in July and August. Severe freezes cause tree damage, as happened in 1994. Devastating freezes have occurred three times in Brazil, most recently in July 1975, reducing the 1976/77 crop to 9.3 million bags from an expected 22 million. A drought can be as damaging as a freeze—for example, drought reduced 1986/87 production to 13 million bags, down 19 million from 1985/86. Drought or freeze during a year following a large crop lowers production in Brazil 16 million bags, on average.

The size of Brazil's coffee crop is affected also by the degree of orchard care, which includes fertilization, pest and disease management, weed control, irrigation, pruning, and tree replacement. Coffee trees, like most tropical and subtropical crops, are highly sensitive to changes in environmental and agronomic conditions. Flowering is triggered by rainfall or irrigation, and fruit development hinges on tree vigor. While orchard care is difficult to measure, world coffee prices affect the willingness and ability of growers to bear the costs. Low prices in 1998/99, however, will not necessarily translate into poor orchard care—the Brazilian government has made grower loans under favorable terms to offset the depressed market.

Factors expected to minimize the off-year production effect in 1999/2000 include full recovery of trees pruned back severely following the 1994 freeze, new plantings and improved cultural practices supported by government assistance, and good weather for flowering and fruit development so far this season. The first official USDA forecast of the 1999/2000 Brazilian crop will be published June 11 on the USDA web site. **AO**

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More USDA information on coffee production by country is available in the Foreign Agricultural Service report *Tropical Products: World Markets and Trade*. See www.fas.usda.gov/http://tropical/1998/98-12/dec98txt.htm

World Agriculture & Trade



Suchada Langley

Brazil's Financial Crisis & the Potential Aftershocks

The intensifying financial crisis in Brazil, marked by sharp devaluation of its currency in mid-January, has renewed concerns about the consequences for U.S. agriculture. Latin America and Asia together bought about 60 percent of U.S. agricultural exports last fiscal year, and Brazil's currency devaluation is already having repercussions in other countries in Latin America.

The Makings of a Devaluation

In Brazil, the Cardoso government's initiation of the *Real* Plan on March 1, 1994 led to 4 very good years. The plan brought economic stability and was effective in curbing hyperinflation, which had been a chronic problem. Under the plan, the *real* (R\$, Brazil's currency) was set against a predetermined goal relative mainly to the U.S. dollar using a "mini-band" mechanism that allowed only small daily changes in the value of the currency.

As the U.S. dollar strengthened in the mid-1990s, however, the *real* began to overvalue relative to the target. The Russian financial crisis in August 1998 heightened fears among investors concerning returns in emerging markets. As capital flight picked up, observers began speculating that the Brazilian government

would devalue its currency. From mid-August 1998 to the end of October 1998, the *real* had lost 2 percent of its value against the U.S. dollar through the mini-band mechanism.

The final development leading to sharp devaluation of the *real* came on January 6, 1999, when a provincial governor, a former President of Brazil, announced a 90-day moratorium on debt payments to the central government to protest strict fiscal measures under an agreement with the International Monetary Fund (IMF). The move raised investors' fears, spurring capital flight. Reportedly, about \$1 billion left the country in the few days immediately following the debt moratorium.

Recognizing that the *real* was under attack, Brazil's Central Bank decided on de facto devaluation on January 13, 1999 by widening the band in which the *real* could be traded each day while preventing a free fall in the currency. The alternative would have been for the government to defend the *real* and potentially deplete its foreign currency holdings. The Central Bank president then resigned, leaving his successor to implement the devaluation. A new currency band was established with a floor of R\$1.20 and ceiling of R\$1.32 per U.S. dollar. This implied possible daily currency movements against the U.S. dollar of plus-or-minus 4.76 percent.

The new band lasted for only 2 days, during which another \$1 billion in capital

Brazil's Currency Depreciated Sharply in January 1999

Percent change from Aug. 1998



Based on daily currency movements.
Source: Pacific Exchange.
Economic Research Service, USDA

World Agriculture & Trade

reportedly left Brazil. The next step was to allow the *real* to float freely, and by February 3 it had tumbled by 32 percent and was trading at R\$1.79 per U.S. dollar. To increase market confidence and stop any panic on stock and bond markets around the world, the decision was taken to completely abandon the mini-band. As part of the package and to discourage investors from withdrawing funds from the country, the Central Bank of Brazil announced that short-term interest rates would increase from 29 to 39 percent. For now, the strategy seems to have stopped the panic, as the pace of dollar flight has declined, although reportedly a total of \$7-8 billion had left the country in January. However, risk remains of a spread of the crisis to other countries.

Minimal Short-term Impact On U.S. Ag Trade

In the short run, Brazil's devaluation will have relatively little impact on U.S. agricultural trade with Brazil, though an expected reduction in U.S. agricultural exports and increase in agricultural imports will likely increase the U.S. agricultural trade deficit with Brazil (\$684 million in fiscal year 1998). In the longer run, the potential for effects on U.S. agricultural trade is greater, particularly if Brazil is unable to regain financial control and the continuing crisis forces other Latin American countries to devalue currencies or change policies—such as raising import tariffs—to stay competitive.

U.S. exports to Brazil. Brazil is a small market for U.S. agricultural exports—about \$0.5 billion in fiscal 1998. The U.S. exports soybeans, consumer-ready food, cotton, and a small amount of wheat and coarse grains to Brazil. A lower value *real* will make these products more expensive to Brazilian buyers, and in the short term, an overall decline in Brazilian demand for consumer-ready food products will pressure U.S. agricultural exports.

U.S. soybean exports will be affected less than consumer-ready food exports. Even before the devaluation, the U.S. was not expected to export soybeans to Brazil this year because of large supplies in Brazil. Most of Brazil's domestic soybeans and soybean meal go to export markets. Thus, to more fully utilize their oilseed crushing

capacity, Brazilian crushers import soybeans (500,000 tons in 1998, all from Paraguay; 1.5 million tons in 1997, mostly from the U.S.). When the U.S.-Brazil price differential was favorable, soybean imports were stimulated by Brazil's drawback program, which essentially has allowed duty-free imports if the soybean products are re-exported. Brazilian crushers have been able to finance purchases via international loans with low interest rates, supporting continued soybean imports.

The extent of the fall in Brazilian demand for other agricultural imports will depend on internal policy adjustments taken to dampen the rise in food prices. For example, to soften the effect of higher import prices, the Brazilian millers association proposed elimination of the 13-percent import duty on wheat flour and the 25-percent tax on bulk ocean freight from countries outside MERCOSUR, the regional trading bloc that includes Argentina, Brazil, Paraguay, and Uruguay.

U.S. imports from Brazil. The U.S. bought over \$1.1 billion worth of agricultural products from Brazil in fiscal 1998, mostly coffee, tobacco, sugar, prepared meat, and orange juice and other fruit

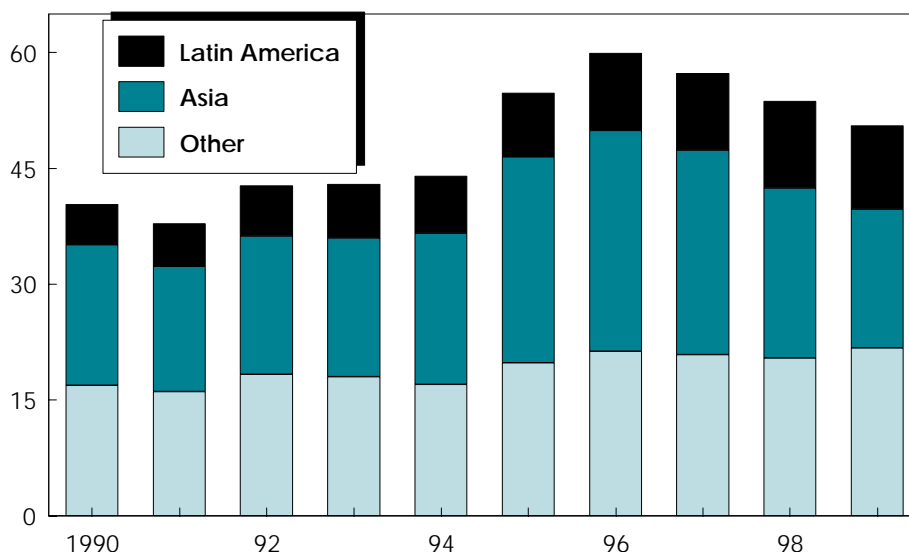
products. The U.S. also imports forest products such as softwood.

The lower value of the *real* will make Brazilian goods more price-competitive in the U.S. market. U.S. consumers will benefit from the lower prices, while producers who compete with Brazilian importers will be hurt. In the short run, increases in the volume of imported food and other agricultural goods from Brazil will be limited by available supply. For example, any near-term increase in Brazil's exports of frozen concentrated orange juice (FCOJ), coffee, and tobacco would have to come at the expense of domestic sales.

While the effects on U.S. agricultural trade are expected to be small in the near-term, Brazil could become a stronger competitor in markets for poultry meat, FCOJ, tobacco, soybeans and other agricultural products if the *real* remains at its lower value over the long term and Brazilian producers respond by increasing production (although the lower *real* will raise the cost of imported inputs). Additionally, policy responses and reforms under the IMF package (e.g., tax code reform, budget deficit reduction) could improve efficiency and potentially lower production costs in the long run.

Latin America Has Been a Growing Market for U.S. Agricultural Exports

\$ billion



1999 forecast.

Economic Research Service, USDA

World Agriculture & Trade

Other Latin American Countries Under Pressure

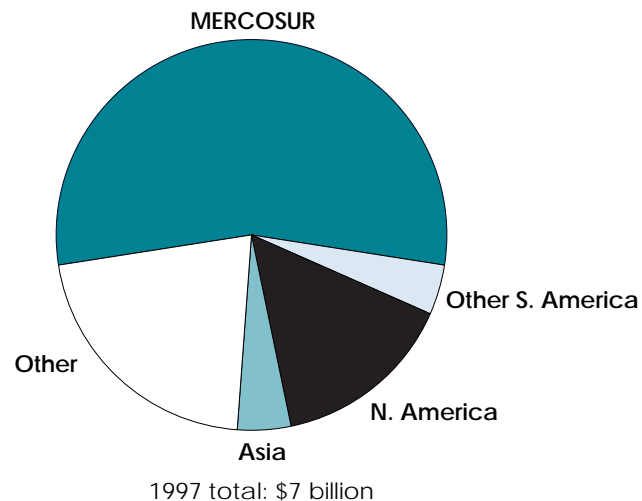
The international financial crisis beginning in Asia in 1997 generated speculative pressures in Latin America and slowed growth rates of many Latin American countries. Brazil's crisis could further affect other Latin American countries through loss of investor confidence and shocks to intra-regional trade. Because of Latin America's dependence on foreign capital to finance current account deficits, the region is vulnerable to sudden withdrawals of foreign capital.

In 1997, Latin America had a current account deficit (the difference between imported and exported goods and services, plus net income and transfers) of \$60 billion, with Brazil alone accounting for more than \$30 billion, or nearly 4 percent of the country's gross domestic product (GDP). In Chile, the current account deficit reached over 5 percent of GDP, followed by 4.3 percent for Argentina and over 2 percent for Mexico. The deficits have increased since 1997. World financial markets and institutions become concerned when current account deficits approach 5 percent of GDP.

A rise in the current account deficit puts pressure on the value of a country's currency. Most currencies in Latin American countries have lost value against the U.S. dollar since 1997—Chile's *peso* over 13 percent, Colombia's *peso* 22 percent, Ecuador's *sucre* nearly 43 percent, Mexico's *peso* 30 percent, Peru's *sol* 14 percent, and Venezuela's *bolivar* almost 18 percent. Argentina pegged its *peso* to the U.S. dollar, preventing any devaluation.

Lack of confidence among foreign investors led to a massive drain on foreign reserves in 1998 for Brazil—the economy that accounts for 40 percent of Latin America's GDP. At the end of 1998, foreign exchange reserves declined to \$40 billion, down from nearly \$70 billion at the end of August 1998. To head off outflows of capital, other countries followed Brazil in raising short-term interest rates

Brazil's Ag Imports Come Mainly from South America



Brazil is a member of MERCOSUR, which also includes Argentina, Paraguay, and Uruguay.

Source: United Nations.

Economic Research Service, USDA

in 1998—Argentina to 10 percent, Chile to 14 percent, Colombia to 33 percent, Mexico to 31 percent, and Venezuela to more than 44 percent.

The principal risk from tightening monetary policy is a slowdown in economic growth that will further weaken domestic and import demand. As interest rates rise, the cost of capital also increases, reducing use of credit for working capital. High interest rates at this time, however, are important to curb the flight of capital and provide these countries time to deal with immediate problems.

Latin America has a significant level of intra-regional trade, which magnifies the potential for the Brazilian crisis to spread. Nearly 40 percent of Brazil's total imports and 60 percent of agricultural imports came from other South American countries in 1997. In addition, total exports are a significant portion of GDP for these countries, ranging from nearly 9 percent for Argentina to 28 percent for Mexico. However, the U.S. is a much more important trade partner for Mexico than for Brazil.

With relatively higher import prices and lower purchasing power, Brazilian import demand will fall. A decline in Brazil's import demand could have a ripple effect on its regional trading partners in Latin America, particularly Argentina. Because Argentina pegs its *peso* to the U.S. dollar, the lower value of the *real* will make Argentine exports to Brazil more expensive. With about 30 percent of its products exported to Brazil, Argentina could be more vulnerable to a trade-linked spread of the crisis than other countries in the region. Argentina, in particular, could look to other markets for wheat and corn exports, intensifying competition with the U.S. To soften the blow of Brazil's currency devaluation, Argentina has requested that Brazil reduce its low-cost financing measure for consumer goods exports to MERCOSUR members. Recently, Brazil agreed to eliminate the measure. **AO**

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Risk Management



Jack Harrison

Farmers Sharpen Tools To Confront Business Risks

As in any industry, risk is a part of the business of agriculture. With farm income currently under pressure from declining farm prices, USDA's Economic Research Service is exploring the subject of risk management in agriculture. This article, the first in a series, describes a variety of management techniques farm operators use to survive swings in weather, markets, and the economy. Other topics in the series will include USDA's farm risk initiatives and an analysis of the effectiveness of different crop and revenue insurance products.

Farmers face an ever-changing landscape of weather, prices, yields, government policies, global competition, and other factors that affect their financial returns and overall welfare. With the shift toward less government intervention following passage of the 1996 Farm Act came recognition of the need for a more sophisticated understanding of farm risk and risk management. Risk management strategies can help mitigate the effects of swings in supply, demand, and prices, so that farm business returns can be closer to expectations.

Risk management is, in general, finding the combination of activities most preferred by an individual farmer to achieve

the desired level of return and an acceptable level of risk. Risk management strategies reduce risk within the farming operation (e.g., diversification or vertical integration), transfer a share of risk outside the farm (e.g., production contracting or hedging), or build the farm's capacity to bear risk (e.g., maintaining cash reserves or evening out cash flow). Using risk management does not necessarily avoid risk altogether, but instead balances risk and return consistent with a farm operator's capacity to withstand a wide range of outcomes.

Although farms vary widely with respect to enterprise mix, financial situation, and other business and household characteristics, many sources of risk are common to all farmers, ranging from price and yield risk to personal injury or poor health. But even when facing the same risks, farms vary in their ability to weather shocks. For example, in an area where drought has lowered yields, falling prices resulting from large worldwide production could have devastating consequences for local farm incomes. With such a downturn, some bankruptcies are likely to occur, and producers who are highly leveraged and have small financial reserves or lack off-farm income would be most vulnerable.

What do farmers themselves say about the risks they face? USDA's 1996 Agricultural Resource Management Study (ARMS), conducted in the spring of 1997 (about a year after passage of the 1996 Farm Act), asked producers how concerned they were that certain types of risk could affect the viability of their farms. Three risk factors of greatest concern to farm operators were uncertainty regarding commodity prices, declines in crop yields or livestock production, and changes in government law and regulation. Issues such as price and yield have historically been a focus of government farm programs. But new policy areas, such as water pollution control and waste management, may well affect future legislation and regulation of agriculture and pose new challenges to operators.

ARMS data show that producers specializing in wheat, corn, soybeans, tobacco, and cotton were generally more concerned about the threat of low yield and/or low price than any other risk. Reduced government intervention in markets for program crops (wheat, corn, cotton, and other selected field crops) under the 1996 Farm Act may have heightened producers' uneasiness about price risk.

Producers of other field crops, nursery and greenhouse crops, and poultry expressed greater concern about changes in laws and regulations than about other risks. This perhaps reflects fears that changes in environmental and other policies could require costly compliance by the agricultural sector. Producers of the other field crops may be wary of changes in regulations addressing soil conservation, land use, and tillage practices, while livestock producers may be particularly concerned about regulations related to waste management and the spread of disease.

Livestock producers also expressed concern about their ability to adopt new technology, perhaps because failure to invest in new production techniques could put them at a cost disadvantage to other producers. For farm operators involved in contracts, expenditures necessary to satisfy production requirements imposed by contractors, such as modification of existing livestock buildings, may add to risk (AO January/February 1999).

Risk Management

Price & Yield Swings Pose Primary Risk

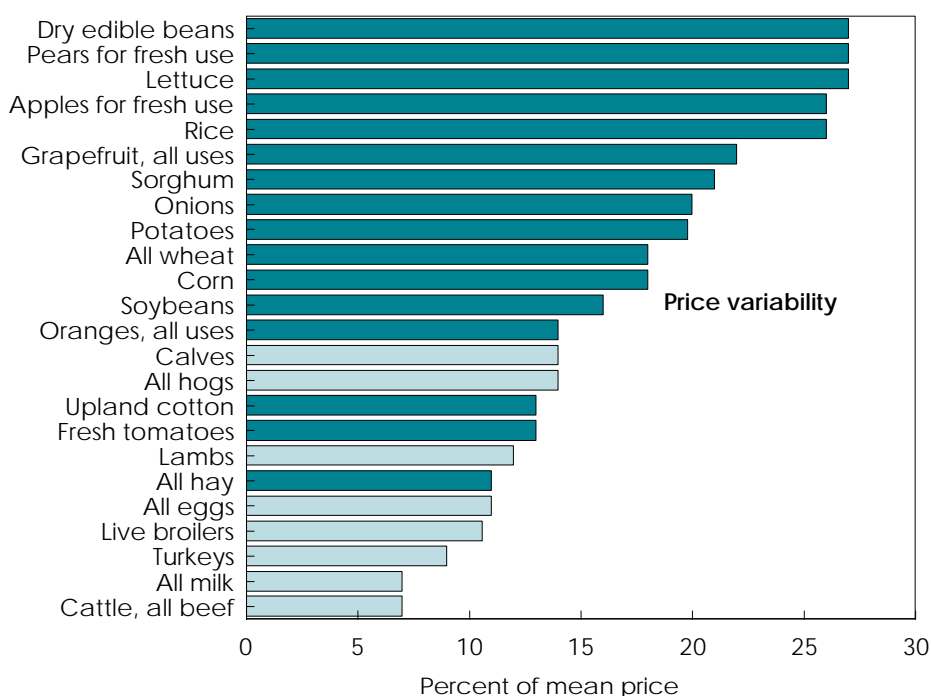
The possibility of lower-than-expected yield is one of the risks identified in the ARMS as a major concern to farmers. Yield variability for a given crop varies by geographic area and depends on factors such as soil type and quality, climate, and use of irrigation. Yield variability for corn, for example, tends to be lowest in the central Corn Belt, where soils are deep and rainfall is dependable, as well as in areas that are irrigated. In Nebraska, where much of the corn production is irrigated, yield variability is quite low. Yield variability is also low in Iowa, Illinois, and other Corn Belt states, where climate and soils provide a nearly ideal growing environment for corn production.

In areas less well suited to corn production, yield variability is generally higher, and producers must deal with the prospect of yields that can deviate significantly from planting-time expectations. Risks associated with high yield variability and the resulting income variability can be mitigated by programs such as Federal crop insurance, as well as by diversification and other tools to help spread farm-level risk.

Like yield variability, price variability differs among commodities. In 1987-96, crop prices showed relatively more variability than livestock prices, largely because crop supplies are affected by swings in crop yields while livestock supplies have been more stable—although recent variability in the hog market illustrates some exceptions exist. Crops that exhibited the highest price variability (deviations exceeding 20 percent above or below the mean) include dry edible beans, pears, lettuce, apples, rice, grapefruit, and grain sorghum. The variability of beef cattle, milk, and turkey prices was less than 10 percent, perhaps reflecting lower production risk and, in the case of milk, the existence of a Federal dairy program.

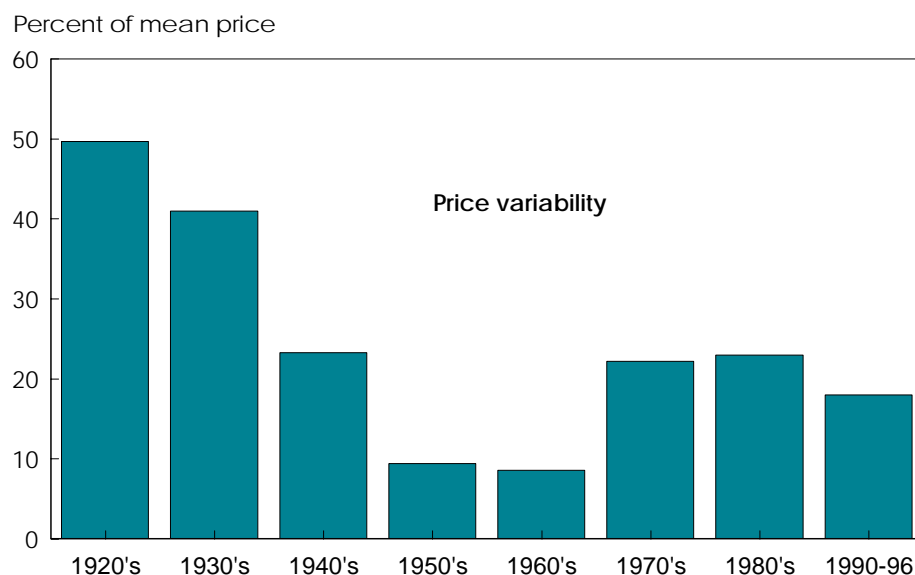
Price variability can change across time depending on year-to-year differences in crop prospects, changes in government program provisions, and shifts in world supply and demand conditions. For example, corn price variability was quite high

During 1987-96, Price Variability Was Generally Higher for Crops Than for Livestock



Price variability measures deviation above and below the mean price for the period 1987-96.
Economic Research Service, USDA

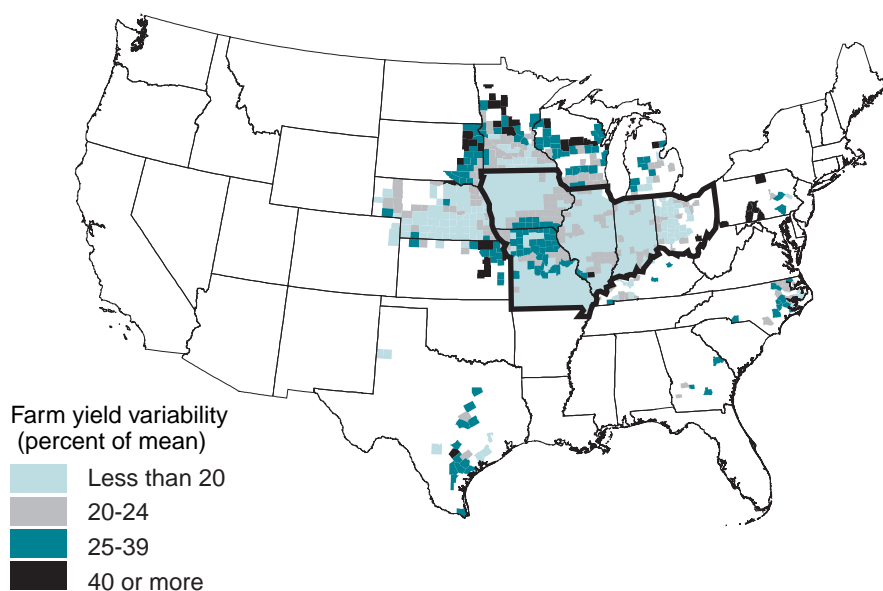
Corn Price Variability in the 1990's Is Near the Level of the Past Two Decades



Price variability measures deviation above and below the mean price for each period.
Economic Research Service, USDA

Risk Management

Corn Yield Variability is Generally Lower for Farms in the Heart Of the Corn Belt



Based on farm-level data, 1985-94, and long-term county-level yields. Includes counties with at least 500 acres planted to corn.

Economic Research Service, USDA

during the 1920's and 1930's, due largely to the collapse of grain prices after World War I and very low yields in 1934 and 1936. Corn prices stabilized during the 1950's and 1960's, a period of high government support, stable yields, and consistent demand. Sizable purchases of corn by Russia early in the 1970's affected variability during that decade, while low U.S. yields in 1983 and 1988 contributed to increased corn price variability in the 1980's. Variability returned to near long-term average levels in 1990-96.

“Natural Hedge” May Stabilize Revenues

Price and yield risks faced by a producer in a given situation, as well as the strength of the relationship between price and yield—the price-yield correlation—can influence the effectiveness of different risk management strategies. The stronger the negative correlation (i.e., yield and price moving in opposite directions), the better the “offsetting” relationship (or “natural hedge”) works to stabilize revenues.

The price-yield correlation for a commodity tends to be more strongly negative for farms in major producing areas, because

yields there are more positively correlated with national yields, and crop yields among farms within a region tend to move together. For example, in a major corn-producing area such as the Corn Belt, corn yields tend to be more positively correlated with a national corn yield, and therefore more negatively correlated with the national corn price. For wheat, where production is more dispersed and U.S. production is a smaller share of the world's crop, the natural hedge is weaker, making incomes more variable for most wheat growers.

When other factors are held constant, the magnitude of a producer's natural hedge has important implications for the effectiveness of various risk-reducing tools. A weaker natural hedge (where low prices more often accompany low yields), for example, implies that forward contracting or hedging in futures is more effective in reducing income risk than when a strong natural hedge exists. In this situation, locking in a sales price for part of the expected crop works to establish one component of the farm's revenue, reducing the likelihood of simultaneously low price and low yield. As a result, hedging can sometimes be an effective risk man-

agement strategy for farms outside major producing regions.

Deciding how much to hedge is more complicated than just assessing price-yield correlation. Income risk is also a function of price variability and yield variability. Hedging effectiveness declines as yield variability increases, and corn yields are typically more variable outside the Corn Belt. Since yield variability tends to outweigh the impact of price-yield correlation, hedging is generally not as effective in less consistent production areas as in the Corn Belt.

No Single Approach Suits All Farms

While factors such as yield variability, price variability, and price-yield correlation can be used to gauge the likely effectiveness of various risk management strategies, producers' attitudes toward risk are also determinants in selecting strategies. Some farmers are less risk averse than others, and, for example, might feel more comfortable in a highly leveraged situation (e.g., carrying a large mortgage) than would others. Similarly, producers may differ in their preferences for risk management tools, some perhaps feeling more at home with forward contracting with a local elevator while others may turn to hedging to manage their risks.

Because farmers face different degrees of variability and differ in their attitudes toward risk, there can be no single approach to suit all farms. Overall, farmers appear to be relying increasingly on forward contracting and other risk management tools to reduce their farm-level risks, due in part to the recent trend toward reduced government intervention in farming. Even so, the 1996 ARMS indicates that keeping cash (or liquid assets) on hand for handling emergencies and for taking advantage of good business opportunities was the number-one strategy used by farms of every size, every commodity speciality, and in every region.

Farm size apparently plays a role in choice of risk management strategy. The ARMS found that operators with annual gross sales of \$250,000 or more were more likely than smaller operators to use hedging, forward contracting, and

A Selection of Strategies for Mitigating Risk

Farmers have many options in managing the types of risks they face. For example, producers may 1) plant short-season crop varieties that mature earlier in the season to beat the threat of an early frost; 2) install supplemental irrigation in an area where rainfall is inadequate or unreliable; or 3) use custom machine services or contract/hired labor to plant and harvest quickly during peak periods.

Most producers use a combination of strategies and tools, because they address different elements of risk or the same risk in a different way. Following are some of the more widely used strategies.

- *Enterprise diversification*—assumes returns from various enterprises do not move up and down in lockstep, so low returns from some activities would likely be offset by higher returns from other activities. Diversification can also even out cash flow. According to USDA data, cotton farmers are among the most diversified in the U.S., while poultry farms, with poultry and poultry products accounting for 96 percent of the value, on average, of their production, are the least diversified.
- *Vertical integration*—generally decreases risk associated with the quantity and quality of inputs (or outputs) because the vertically integrated firm retains ownership control of a commodity across two or more levels of activity. Vertical integration also diversifies profit sources across two or more production processes. In farming, vertical integration is most common for turkeys, eggs, and certain specialty crops.
- *Production contracts*—guarantee market access, improve efficiency, ensure access to capital, and lower startup costs and income risk. Production contracts usually detail inputs to be supplied by the contractor, the quality and quantity of the commodity to be delivered, and compensation to be paid to the grower. The contractor typically provides and retains ownership of the commodity (usually livestock) and has considerable control over the production process. On the downside, production contracting can limit the entrepreneurial capacity of growers, and contracts can be terminated on short notice.
- *Marketing contracts*—set a price (or pricing mechanism), quality requirements, and delivery date for a commodity before harvest or before the commodity is ready to be marketed. The grower generally retains ownership of the commodity until delivery and makes management decisions. Farmers generally are advised to forward price less than 100 percent of their expected crop until yields are well assured to avoid a shortfall that would have to be made up by purchases in the open market.
- *Futures contracts*—shift risk from a party that desires less risk (the hedger) to one who is willing to accept risk in exchange for an expected profit (the speculator). Farmers who hedge must pay commissions and forego interest or higher earning potential on money placed in margin deposits. Generally, the effectiveness of hedging in reducing risk diminishes as yield variability increases and the relationship (correlation) between prices and yields becomes more negative. Hedging can reduce, but never completely eliminate, income risk.
- *Futures options contracts*—give the holder the right, but not the obligation, to take a futures position at a specified price before a specified date. The value of an option reflects the expected return from exercising this right before it expires and disposing of the futures position obtained. Options provide protection against adverse price movements, while allowing the option holder to gain from favorable movements in the cash price. In this sense, options provide protection against unfavorable events similar to that provided by insurance policies. To gain this protection, a hedger in an options contract must pay a premium, as one would pay for insurance.
- *Liquidity*—involves the farmer's ability to generate cash quickly and efficiently in order to meet financial obligations. Some of the methods that farmers use to manage liquidity, and hence financial risk, include: managing the pace of investments (which may involve postponing machinery purchases), selling assets (particularly in crisis situations), and holding liquid credit reserves (such as access to additional capital from lenders through an open line of credit).
- *Crop yield insurance*—provides payments to crop producers when realized yield falls below the producer's insured yield level. Coverage may be through private hail insurance or federally subsidized multi-peril crop insurance. Risk protection is greatest when crop insurance (yield risk protection) is combined with forward pricing or hedging (price risk protection).
- *Crop revenue insurance*—pays indemnities to farmers based on revenue shortfalls instead of yield or price shortfalls. As of 1998, three revenue insurance programs (Crop Revenue Coverage, Income Protection, and Revenue Assurance) were offered to producers in selected locations. All three are subsidized and reinsured by USDA's Risk Management Agency.
- *Household off-farm employment*—may provide a stream of income to the farm operator household that is more reliable and steady than returns from farming. In essence, household members working off the farm is a form of diversification. In 1996, according to USDA's ARMS data, 82 percent of all farm households reported off-farm income exceeding farm income. In every sales class (including very large farms), at least 28 percent of the associated farm households had off-farm income greater than farm income.

Risk Management

What Steps Would Farmers Take to Manage Financial Difficulties?

	Small farms*		Large farms**		Total U.S.
	Less than \$50,000	\$50,000-\$249,999	\$250,000-\$499,999	\$500,000 or more	
	Percent of farms				
Management/financial strategy:					
Restructure debt	24	48	46	49	30
Sell assets to reduce debt	31	28	31	29	30
Use more custom services	7	18	17	20	10
Scale back farm business	26	23	20	24	25
Diversify into other farm enterprises	12	23	21	21	15
Spend more time on management	19	38	47	45	24
Use advisory services	19	22	28	26	20
Adjust operating costs	34	54	59	57	40
Improve marketing skills	30	47	53	53	35

*Annual gross sales under \$250,000. **Annual gross sales \$250,000 or more.

Source: 1996 Agricultural Resource Management Study, USDA

Economic Research Service, USDA

virtually all other types of risk management strategies. In contrast, operators with sales under \$50,000 were less likely to use forward contracting or hedging, and fewer reported using enterprise diversification to reduce risk.

The ARMS data also indicated that producers in the Corn Belt and Northern Plains were somewhat more likely to use risk management strategies than those in the Southern Plains, Northeast, and Appalachia. About 40 percent of producers in the Corn Belt and Northern Plains regions used forward contracting in 1996 and about 25 percent used hedging in futures or options.

Farm legislation also affects adoption of risk management strategies. About one-third of producers nationwide reported receiving direct government commodity payments in 1996. Of these, between 5 and 8 percent (1-3 percent of all U.S. farmers) indicated they had added or increased use of at least one risk management strategy or tool (forward contracting, hedging, insurance, or other strategy) in 1996 in response to provisions of the 1996 Farm Act.

A period of financial stress may induce an operator to shift risk management strategies. The 1996 ARMS questioned farmers about production, marketing, and financial activities they might undertake if faced with financial difficulty. Producers with sales of \$50,000 or more indicated they would adjust costs, improve marketing skills, restructure debt, and spend more time on management decisions.

Producers with sales under \$50,000 (who generally receive a substantial share of household income from off-farm sources) also responded that they would adjust costs when faced with financial difficulties. But small-farm operators would be more likely than larger operators to sell farm assets or scale back their operations. Further, small-scale producers were much less likely to spend more time on management or on improving their marketing skills.

When individual efforts to deal with financial stress fail and large numbers of farms face significant financial loss, the Federal government has often stepped in with assistance to agriculture in the form of direct payments, loans, and other types of aid. Most recently, the 1999 Agricul-

tural Appropriations Act included \$2.375 billion for emergency financial assistance to farmers who suffered losses due to natural disasters. Under this legislation, farmers are eligible for payments either for losses to their 1998 crop, or for losses in any 3 or more crop years between 1994-98. Farmers with crop insurance receive slightly higher payments than those without, and those receiving emergency benefits must agree to buy crop insurance (if available) in 1999 and 2000. In addition, the legislation provides an incentive for purchasing higher levels of crop insurance coverage in 1999 by earmarking an estimated \$400 million to subsidize farmers' insurance premiums.

Such assistance is undoubtedly critical for producers who are facing financial difficulty. However, it raises questions as to how the potential for direct payments in times of disaster affects producers' decisionmaking with regard to tools and strategies that can help them manage risk and perhaps avoid financial stress. Linking receipt of government assistance to adoption of a risk management strategy, namely the purchase of crop insurance, encourages producers to gain experience with a program that can provide protection in crisis years in the future. Understanding the risks faced in farming and the use of different tools by producers can lead to new strategies and educational approaches to cut risk and can perhaps help reduce the incidence of farm financial stress. **AO**

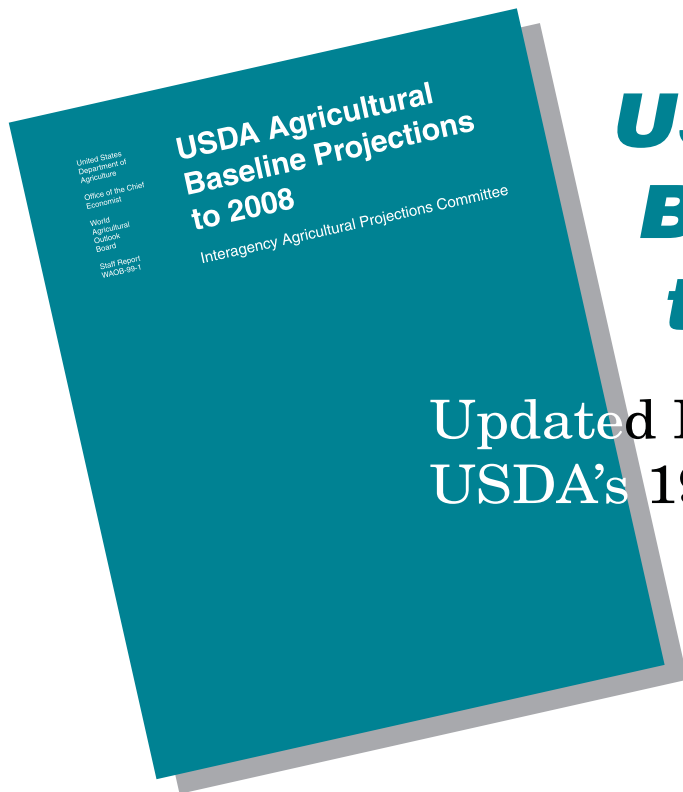
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Special Article

Value-Enhanced Crops: Biotechnology's Next Stage

Biotechnology's next quest, to provide field crops with value-enhanced qualities for end-users—output traits—is underway. Biotechnology's first stage featured crops with improved agronomic qualities—input traits—valued by farmers, such as resistance to pests. The industry now visualizes a system in which farmers grow crops designed for the specific needs of end-users in food manufacturing, the livestock sector, and even the pharmaceutical industry. Breaking with agriculture's traditional supply-side orientation may not be easy, however. Whether biotechnology's second stage is a wave or a modest ripple will hinge on several economic and technical factors.

U.S. farmers already grow, on a relatively small scale, a number of high-value crops—such as food-grade soybeans and white corn—developed through conventional breeding. These commodities are typically classified as specialty crops that have fairly “thin” markets that can easily be swamped if production surges.

Genetic engineering promises to facilitate development of crops with more improvements in end-use characteristics than conventional breeding has been able to accomplish. In some cases, these traits will appeal to wider segments of the market than conventional specialty crops have, although in other cases their markets will be narrower. To succeed, however, the products first must be able to deliver—not just improved quality traits, but also good agronomic performance. Second, and no less important, the crops must prove their overall value to producer and user. In many cases, pricing and marketing arrangements will not be business as usual and may require several changes.

Farmers quickly saw the value of the first wave of biotech crops with built-in protection against insect pests or resistance to selected herbicides. Acreage of biotech-developed soybean, corn, and cotton has soared since their commercial introduction in 1996 (*AO* August 1998). Adoption of the next stage of biotech crops may proceed more slowly, as the market confronts issues of how to determine price, share the value, and adjust marketing and handling to accommodate specialized end-use characteristics. And competition from existing alternative products will not

Value-enhanced crops may be produced through conventional breeding techniques as well as through genetic engineering.

USDA does not make official estimates of acreage or production of genetically modified varieties—the data are included in total estimates for the various crops. Numbers cited here were developed from industry sources, and are not official USDA data.



Agricultural Research Service

evaporate. Pitfalls that have accompanied the first generation of biotech crops, such as the trade dispute with Europe over approval and labeling of genetically modified crops, will also affect the next stage of products.

Some industry analysts believe the development of more end-use quality traits will largely “decommodify” the existing marketing system for field crops. In other words, there would be a movement away from bulk handling and blending of undifferentiated crops under very broad grades and standards categories and toward a system that can meet more specialized needs of buyers, even to the point of preserving the identity of a crop from the farm to the user. The added costs of such specialized handling will have to be justified by the value of the new crops to buyers.

What Are Some of the New Crops?

Many promising new value-enhanced or output traits are starting to appear among the major field crops, most—although not all—created through biotechnology. Some are already available; others are still a few years away from the market. Following are highlights of some leading developments.

High oleic soybeans, with around 50,000 acres planted in 1998, yield oil that contains less saturated fat than conventional soybean oil. Because it is more stable, the oil does not require hydrogenation for use in frying or spraying, which reduces

processing costs. Moreover, hydrogenation creates trans fatty acids, which studies have associated with adverse serum cholesterol levels. In addition to its desirable health qualities, high-oleic soybean oil has a longer useful life, which appeals to the fast-food industry. High-oleic soybeans may also serve as a platform for stacking other traits—i.e., including more than one specialized biotech trait in a single variety.

Soybeans with improved animal nutrition that bolster the protein and amino acid content of soybean meal are near commercial introduction. Soybean meal is the most important protein source for U.S. livestock and poultry. Increased levels of the amino acids lysine and methionine in particular have potential to reduce the proportion of higher cost protein meals required in the ration.

Improved food-quality soybeans are currently in production. While most of the focus for soybeans is on improving oil and meal characteristics, since these uses represent the bulk of the market, some new varieties have improved food qualities. For example, high-sucrose soybeans that have a better taste (less “beany”) and greater digestibility were introduced recently, and around 25,000 acres were planted in 1998. While soy protein has played a minor role in the U.S. food supply, improvements could help expand domestic consumption, as well as offer good export potential.

Although high-oil corn was not developed through biotechnology, it will likely be used as a common platform to stack new input and output biotech traits.

New varieties of canola, bred for superior oil qualities, are already on the market, although they are less important in the U.S. than in Canada, where canola is a major crop. *High-lauric canola* has been grown in the U.S. since 1995, and plantings reached 80,000 acres in 1998. It produces an oil composed of about 40 percent lauric acid. This fatty acid is a key ingredient in soaps, detergents, lubricants, and cosmetics, and the lauric acid in the oil from this canola variety replaces lauric acid from coconut or palm kernel oils produced in Southeast Asia. *High-stearate canola* is expected to be introduced within a few years. The oil from this variety, high in stearic acid, solidifies at room temperature without hydrogenation and would be used for baking, margarine, and confectionery foods that cannot use liquid oils. It would be a healthier alternative to tallow, currently the major source of stearic acid.

Mid-oleic sunflower seed, a conventionally bred type, has a modified fatty acid profile. It was grown on 100,000 acres in the U.S. in 1998, and plantings are expected to expand sharply this spring. Mid-oleic sunflower seed produces low-saturated-fat oils with 60-75 percent oleic acid, compared with 16-20 percent from standard sunflower hybrids. The oil has potential to replace

Defining Biotechnology

Biotechnology can be defined as the use of biological organisms or processes in any technological application. Genetic engineering can be thought of as a subset of biotechnology, describing a set of techniques for altering the properties of biological organisms. Using genetic engineering techniques, individual genes can be transferred between organisms, or genes in an organism can be modified to create plants, animals, or microbes with improved traits for biotechnological applications. In this article, the terms “biotech” or “biotechnology,” “genetically engineered,” and “genetically modified” are used interchangeably.

cottonseed and partially hydrogenated soybean oils in frying and salad oils. Because the mid-oleic has higher yields that are comparable to standard hybrids, this type is expected largely to replace high-oleic varieties that contain 77-89 percent oleic acid and that currently account for 10-15 percent of U.S. sunflower acreage. The market for the high-oleic variety has tended to be limited to higher value uses as a cocoa butter substitute in cosmetics because its reduced yields have required high premiums.

Value-enhanced corn will offer several improved nutritional traits for livestock feeding. Since grain is fed primarily as a source of energy, many of the new value-enhanced varieties aim to increase the content or availability of energy. But some new varieties will also include more protein and better amino acid balances, which would reduce the need to buy supplemental feed ingredients. More variations on this theme are in the works, and a few varieties are already on the market.

High-oil corn, developed through conventional breeding, is the most important corn variety now available with an enhanced nutritional profile. This variety has been commercially available for about 6 years, and acreage has increased significantly each year, reaching 900,000 acres in 1998. Although its oil content varies, high-oil corn can contain as much as double the 3.5-4 percent oil in traditional “commodity” corn. The higher oil content means more energy, which improves feed efficiency; it also reduces the need to add fat to some rations and delivers higher levels of essential amino acids like lysine and methionine. In addition, the higher oil content reduces dust levels and improves palatability. Although high-oil corn was not developed through biotechnology, it will likely be used as a common platform to stack new input and output biotech traits.

Low-phytate or low-phytic-acid corn, providing increased availability of phosphorous, will be marketed within the next year. It has environmental appeal because its use in feed means hogs and poultry will pass less phosphorous in their waste, reducing pollution problems. And because of its greater digestibility, it holds the added promise of cutting feed costs, by allowing the animal

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to absorb more of corn's phosphorus content and eliminating the need for phosphorus supplements.

Several existing, conventionally bred corn hybrids have improved traits for food and industrial purposes. These include *hard endosperm* corn, desired by dry millers for preparing food products, and corn with altered starch content, such as *waxy corn* used largely by the wet milling industry. Further improvements in food and industrial use characteristics are expected through biotechnology research.

A substantial portion of cotton acreage is already planted to biotech varieties with crop protection traits, but most end-use traits are probably 3-4 years away. *Colored cotton*, a trait that would reduce the need for chemical dyes, is already available on a niche market basis. Another major area of research is *fiber quality improvement*, such as polyester-type traits, to make sturdier fabrics. Some researchers hope to develop *wrinkle-resistant cotton* and even *fire-retardant qualities*. Improvements in cottonseed are also envisioned that could make cottonseed oil more useful as an animal feed.

Wheat lags behind the other major crops—even first-stage input-trait biotech varieties are not commercially available. The lag in part reflects technical factors—it is more complex to breed wheat than corn, for example. The primary reason, however, is economic. The wheat seed market is relatively small; many farmers save seed instead of purchasing it—unlike corn seed, virtually all of which is purchased—creating fewer incentives for the private sector to invest in wheat research. But in recent years, investment in wheat research has increased substantially, and use of reliable genetic transformation methods portends pay-offs in the next few years. Like corn or soybeans, the first biotech wheat, which should be introduced soon, will likely offer crop protection traits such as herbicide tolerance.

Wheat quality traits will concentrate on major end uses such as breadmaking, other baking, and noodlemaking. Current end-use trait research focuses on modifying gluten and starch content, creating uniform kernel size, bolstering mineral content, and numerous other traits that could improve wheat milling, dough properties, and bread and noodle texture. The case of hard white wheat (*AO* August 1998), a conventionally bred crop, may be instructive in switching crop variety development more to an end-use focus.

Nutraceuticals, a category of biotech or conventionally bred crops designed to produce medicines or food supplements within the plant, may be developed using any number of crops, depending on the nature of the pharmaceutical or nutritional supplement to be produced. Researchers claim nutraceuticals, also called “functional foods,” could conceivably provide immunity to a disease or improve the health characteristics of traditional food—e.g., canola oil with a high beta-carotene content.

Will Farmers Adopt These Crops?

Farmers quickly adopted the first-stage biotech crops that enhance crop protection or lower input costs. The pace of adoption will likely be much slower for many value-enhanced crops, despite their excellent prospects. While both input and output traits involve higher seed costs—seed premiums often incorporate a technology fee—and may require some agronomic changes, the value-enhanced crops will require additional changes and costs to bring the crop to market.

To be a successful supplier of value-enhanced crops, producers may need to clean all harvesting equipment between uses on different output-trait crops, provide separate storage bins, and make substantial changes in marketing arrangements. These steps present few obstacles if higher product prices generate sufficient returns. But until some new products are well established, there may be a chicken-and-egg syndrome: buyers may be discouraged by an erratic or insufficient supply while growers confront a market that is too thin to support large enough premiums.

Farmers quickly adopted the first-stage biotech crops that enhance crop protection or lower input costs. The pace of adoption will likely be much slower for many value-enhanced crops, despite their excellent prospects.

USDA-Illinois Market News recently began a value-added grain survey of producers. While the survey primarily covers market opportunities for conventionally bred specialty corn and soybeans, it illustrates the types of issues that can arise with any specialty crops. For example, the survey reported that heavy signup by producers for 1999 white corn contracts squeezed premiums, and contracting opportunities were no longer available for some value-enhanced grains. The survey reported additional premiums for some high-oil corn were available from early contract signup bonuses and for certain crop chemical usages, although premiums for high-oil corn also weakened as more producers signed up.

Given the current low-price environment and the great amount of flexibility in planting decisions, farmers are certainly receptive to new products that offer potential for premium prices. However, there probably will be more interest in contracting and in other means of reducing risks than has been the norm in commodity markets. As demand for the new crops increases, new marketing channels will likely develop. Farmer interest will increase if improved technology can prevent the lower yields often associated with current specialty crops. Finally, the ability to stack genes—include more than one specialized biotech trait in a single variety—will likely mean that desirable input traits will be offered along with output traits to meet the needs of producers.

Distinguishing Commodities by Quality Traits

Early indications of the transformation from bulk handling and blending of undifferentiated crops to a system that can meet more specialized needs of buyers have appeared in connection with conventionally bred crops entering niche markets. For example, one snack food manufacturer, in order to maximize control over its final product, specifies the preferred corn hybrids it will purchase. Some buyers of soybeans for food use, including some for food products exported to Asia, specify varieties with particular end-use characteristics. For organic crops, the degree of product control extends beyond varietal selection to include production methods.

A large degree of institutional inflexibility exists in the current crop marketing system—margins are low and profits are a function mainly of large volumes. In general, it costs more to provide additional handling and storage facilities to isolate specific crop varieties than to handle conventional commodities; how much more depends on the quantity as well as the degree of control needed. Buyers who can obtain the traits or quality they need more cheaply through the conventional system will have little incentive to change.

Attempts to shift the commodity system to one that could better handle differentiation by end-use characteristics are not new and have been well documented by Professor Lowell Hill at the University of Illinois. Hill has noted, for example, that as early as 1954 USDA developed a quick method for determining the oil and protein content of soybeans so that farmers could market soybeans according to the value of the oil and meal they would yield. But the measure was

never adopted in grain standards. Similarly, in the case of wheat, numerous attempts to incorporate protein content into grades and standards have failed over the years. Current grain standards basically describe physical characteristics with relatively little bearing on end-use performance, although wheat buyers routinely specify protein requirements, and supplemental testing is done at different points in the marketing chain.

In international trade, most buyers have long expressed interest in purchasing high-quality grain, but in practice have often balked at paying more for such quality. The Canadian Wheat Board has controlled varieties grown and exported from Canada to try to capture premium markets, but most exporters sell blended grain meeting minimum grade requirements. However, given the declining role of large state trading organizations in several countries in recent years, there are some signs of shifts in buying habits. As millers and other private buyers gain influence in import decisions, there are indications that quality concerns are becoming more important.

The critical difference now, in the era of biotechnology, from previous efforts to add quality dimensions is genetic engineering's ability to deliver vastly enhanced quality traits. New crops may lead to reduced processing costs or add to the marketability of the finished product to the consumer. However, the extent of the move away from the old commodity system will be determined mainly by costs and benefits—i.e., how much users are willing to pay for the additional value.

Changes to Come in Marketing & Coordination

The advent of additional value-enhanced crops, both biotech and conventionally bred, may bring higher costs to preserve and deliver this value to specific end-users. The most stringent handling system, identity preservation, requires that a crop be completely isolated, from the grower's field through harvest and on-farm storage, to the elevator and subsequent shipment to the final destination—there can be no commingling with similar crops. For some traits, controls over storage and assembly from farm to processor may be less stringent if testing can verify the desired quality. For these traits, segregation, rather than the more stringent identity preservation, might be the more accurate term. Barley used for malting is handled in this way—it is separated from barley going into feed, but preservation of its identity is not required.

In any case, increased costs, such as for separate storage facilities at the farm or elevator, may be incurred to market value-

enhanced crops. For complete identity preservation (organic crops provide an example), separate handling could mean dedicated rail cars, trucks, or holds in barges, or at least thorough cleaning of carriers before and after use. Use of intermodal containers for transporting crops may be appropriate in some instances, but this may increase costs even further.

The marketing arena will experience a clash of the traditional, volume-dominated system with the need to handle smaller quantities of specialized products at higher unit costs. In many cases, farmers may bypass sales through the country elevator and sell directly to the buyer. Some analysts expect that more marginal elevators that are unable to compete on volume with the bigger operations for commodity crops will improve their prospects by dedicating themselves to the special handling of new crops.

Signs are emerging that the major agribusiness firms, including grain merchandising companies and large cooperatives, are also preparing for these marketing changes. The 1998 annual report

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of Archer Daniels Midland Co. (ADM), for example, one of the largest grain firms in the world, extensively discussed the growing potential for more trait-specific grains. The company recognized that growing, handling, and transporting crops on an identity-preserved basis will become an increasingly large part of the domestic and export grain market. Cargill, another major agribusiness firm, has started a program through its seed division to provide farmers with bins for handling value-added production, to help producers gain entry into markets where they can gain premiums for their crops.

When farmers grow crops for specialized end uses, success requires coordination among technology providers, farmers, and end-users. More control will be required throughout the growing and marketing process, from selecting the seed to delivering the crop to the final customer, and the higher the investment, the greater the incentive to establish rigid specifications. This could mean a vertically integrated system owned largely by one firm.

Although a greater focus on end-use traits will probably mean further integration, such integration will not necessarily be accomplished through a vertical system under the same ownership. Even at this early stage, new alliances, joint ventures, partnerships, and other arrangements are being formed to take advantage of opportunities along the "value chain." Contracting is expected to become more common as a means of mitigating producers' risk and thus providing the farmer a greater incentive to grow a quality trait crop (see page 15). Although contracting, especially production contracting, has been quite limited for the major field crops, it is widespread for many vegetables and specialty grains (40 January/February 1999).

Of all value-enhanced crops, some of the nutraceuticals are the most likely to be grown in a system with tight controls from farm to end-user because of their very high value and the need for precision in their production. A few other new crops may fit this pattern, but many may not require such tight control. In these cases, where fewer controls are needed and thus costs for specialized production and marketing are lower, less coordination will be required and the process may remain closer to the current open market system.

Pricing Tied to Commodity Markets?

The prices of commodity crops are shaped mainly by supply and demand factors in the market, with sporadic influences from government policies. For value-enhanced crops, a central issue will be how to determine the price that reflects the quality attributes that account for added value to the buyer. Because existing grades and standards do not directly address most end-use concerns, and because there will be a diversity of new end uses to value, effective measurement technology will be critical to verify the presence of the trait and quantify the amount.

Currently, most specialty crops receive price premiums relative to a futures reference price or a spot cash price at a specific location, and many of the new output-trait crops may be priced similarly. The exact price discovery mechanism for output-enhanced traits, however, is uncertain and will require time to develop. The producer must cover costs of production and marketing, and the buyer must achieve a reduction in input costs and/or increased earnings before a market for an enhanced output trait can begin.

The willingness of the buyer to pay participants in the supply chain will depend on many factors, including price and market size for the final product, competing sources of the trait and their prices, potential for cost reduction to the processor, volume of the trait handled, and overall competitiveness of the market. A link to a futures market provides a useful means of price discovery; if value-added crops are successful enough, futures exchanges might eventually be compelled to modify contract specifications.

The marketing arena will experience a clash of the traditional, volume-dominated system with the need to handle smaller quantities of specialized products at higher unit costs.

An alternative approach would be a system of prices administered by the buying firm, which could well be adopted in a tightly controlled system like vertical integration or contract production. It would probably be more common for very high-value traits and perhaps for quality crops without substitutes.

The Case of High-Oil Corn: Early Evidence of Changes to Come

Although high-oil corn is a very promising product, its experience may illustrate many of the issues that other value-enhanced crops may also face. High-oil corn acreage has increased significantly each year since its introduction, but it has been dwarfed by acreage of pest-resistant Bt corn, which was commercialized later. In 1998, U.S. plantings of Bt corn—incorporating the leading biotech corn input trait developed from the bacteria *Bacillus thuringiensis*—reached about 16 million acres, while high-oil corn plantings amounted to about 900,000 acres.

But acreage data alone are misleading as an indicator of a crop's importance; high-oil corn serves as a prototype that might provide valuable lessons for other new crops. On the supply side, the high-oil seeds are widely available through many seed companies, and contracting opportunities are available through the Internet. Price premiums are paid on a sliding scale that has ranged as high as 30 cents per bushel, depending on the oil content of the delivered crop—tested at the elevator—and when the

crop was delivered. A joint venture of technology providers and grain merchandisers has developed a large network of participating elevators; growers can sign up for specified delivery times throughout the year to avoid a post-harvest glut and even out the flow of product. A major transportation company is cooperating to create a supply chain.

From the use side, demand for high-oil corn is concentrated in two segments of the market: export markets, largely in tropical countries where the cost of fat is generally high, and U.S. farm-level livestock feeders. By using high-oil corn, the farmer saves the costs of purchasing and mixing supplemental fats. However, the industry likens the current marketing situation to picking the lowest hanging fruit off the tree first—the next stage of building demand will be tougher, because it will require a high degree of coordination between growers and end-users. The greatest share of the potential market is the large integrated poultry and livestock operations, which will need huge volumes of the product at levels that cannot yet be supplied. Another critical problem is competition on the energy side from this country's enormous and cheap supply of waste fats and grease generated by the fast-food and other industries, as well as competition from synthetic amino acids like lysine.

Nevertheless, development of the high-oil corn marketing system as it currently exists is a substantial achievement. If high-oil is stacked with other traits, it will be well positioned for future growth. Continental Grain has managed the export business for high-oil corn, a business that is likely an attractive asset in Cargill's proposed acquisition of Continental.

Several Issues Far from Settled

Despite the technical potential to develop a myriad of new quality traits, the marketplace is not likely to support designer or boutique crops to meet every specialized use, and the traditional commodity system for crops will not disappear. Stacking of numerous traits may expand survival prospects, but ultimately the benefits of the improved crops must exceed their additional costs.

The market will determine the economic viability of these new crops, for both domestic use and export. Some crops may not survive the marketplace test. Some new crops will remain small

simply because of their agronomic limitations, similar to minor oilseeds like sunflowers or canola that can be grown profitably only in certain regions.

Competition from existing products will remain intense for some end uses. For instance, many new varieties of corn and soybeans will offer increased amino acid content for animal feeds. But two of the largest U.S. lysine producers have announced plans in recent months to expand production, which should lead to sharp price competition. Because of lower costs, commodity crops will continue to appeal to a large segment of the market, but new crops with broad appeal will benefit from economies of scale and declining costs as markets grow.

Many uncertainties accompany the newly forming institutional arrangements to price and market the crops, and to provide a means of sharing the value and bearing risks. Many farmers are apprehensive about tightly controlled production and marketing channels that could potentially reduce their independence. Technology firms have made huge investments that they will presumably try to recoup through favorable marketing arrangements, but the farmer will have to share in the added value to spur adoption.

Finally, several public policy questions could arise as value-enhanced crops gain popularity. For example, will market news reporting expand to cover many new crops? Should government grades and standards be modified? And what will be the role of the public sector if disputes arise over nongrade factors or verification of test results and equipment?

The rate of introduction of value-enhanced crops, driven largely by biotechnology, is expected to accelerate in the next few years, assuming consumer acceptance of biotech crops. While previous attempts to develop a more consumer-oriented, end-use crop focus have had limited success, indications are that this new effort may be different because of the vastly superior quality enhancements possible through genetic engineering. **AO**

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Special Article

Testing May Facilitate Marketing of Value-Enhanced Crops

If the proportion of value-enhanced crops on the market increases significantly, as expected, there will be a parallel need for tests to verify and measure the presence of specific traits. Current grades and standards for commodity crops are supported by routine sampling, inspection, and measurement procedures specified by USDA's Grain Inspection, Packers, and Stockyard Administration (GIPSA). Grains are tested primarily for visual traits such as cleanliness or damage, and the testing procedures are well accepted, quick, and relatively inexpensive.

Testing of value-enhanced crops will likely require development of genetic markers to identify specific varieties as well as tests to verify the presence of added or altered traits or nutritional properties. The issue becomes more complicated if the new variety was produced by genetic engineering technologies. Recent European Union (EU) regulations require labeling of any products that contain DNA or protein from genetically engineered products; labeling regulations also have been proposed in Japan. It is also possible that a market for products produced from inputs that have not been genetically engineered will develop in the U.S. in conjunction with certification of foods as "organic."

U.S. grain is commonly blended at the elevator. In the absence of easy, cheap, or acceptable testing, the proliferation of value-added crops in the supply chain will require methods for identity preservation. Value-added crops might require a "field-to-table" paper trail for product identity to be strictly preserved. On the other hand, if a test can verify a minimum content of a certain trait that satisfies users' needs, it may be possible to allow some blending of crops. Thus, the availability of rapid, accurate, and inexpensive tests to verify or quantify the value-added trait could have a strong influence on the cost of marketing value-enhanced crops.

The need for testing raises several economic, technical, and possibly political issues that will shape future market arrangements for value-enhanced crops. Will the tests be acceptable to both buyers and sellers? Can the tests be performed economically, rapidly, and simply with reliable accuracy? Are there reliable techniques to ensure random sampling and adequate representation within a test sample? USDA's standard sampling protocols for testing grains and seeds could be adopted as standards for qualitative and quantitative testing of value-enhanced traits. In addition, work is in progress in both the U.S. and Canada to develop methods and standardize procedures for testing of grain quality and value-added traits.

Many new crops in development will offer enhanced nutritional properties, such as increased oil, protein levels, or

starch content, or qualitative alterations in the amino acid content or the fatty acid composition of the oil. Tests to verify and quantify the presence of these properties are being developed primarily for pricing and marketing purposes.

One very promising technique for rapid assessment of these traits is near-infrared spectroscopy (NIRS). The pattern of absorption or reflection of NIR light is unique for each compound, and NIRS determines the quantity of a compound present by measuring the amount of NIR light absorbed or reflected. Following initial purchase of NIR spectrophotometers (about \$20,000), the tests are inexpensive, rapid, and simple enough to be performed by on-site personnel with minimal training, and have been found to be accurate and reproducible. This technique has already become popular among grain elevator operators for on-site testing of high-oil corn (HOC), and it can also be used to measure protein and starch content as well as the levels of a specific amino acid or fatty acid in grain or processed products. GIPSA recently began offering a testing service upon request for corn oil, protein, and starch using NIR technology.

Other testing methods will be required to analyze new crop varieties for specific proteins or to quantify high-value products such as vaccines or pharmaceuticals, for example. One such test, the ELISA (enzyme-linked immunosorbent assay), analyzes for a specific antibody reaction that marks the presence of the expected protein. ELISA tests and similar assays are currently used to detect mycotoxins in corn and other grain. These procedures require minimal equipment, and only a very small amount of the product needs to be tested. Multiple samples can be processed in a few hours, making the assay relatively adaptable for on-site testing at grain elevators or processing plants.

Because of EU regulations, as well as the possibility that genetically modified foods will be ineligible for certification as "organic" in the U.S., EU researchers, private seed companies, and commercial testing services in the U.S. are developing quantitative tests to detect protein and DNA in genetically engineered crops and products. The ELISA test can be adapted to detect genetically modified protein. A number of methods are available to detect specific DNA sequences, the most powerful being the polymerase chain reaction (PCR). In PCR, specific DNA fragments are reproduced or amplified and separated on a gel, and the size and intensity of the DNA band produced indicates the presence and quantity of foreign DNA within the plant.

PCR is a very sensitive procedure, capable of detecting specific DNA sequences at very low levels, so reliable standards and controls are necessary, and the sensitivity of the tech-

nique can lead to false results if the methods are not precisely followed. As a result, PCR will not lend itself to easy adaptation for rapid, on-site testing. Several companies have recently begun offering PCR-based testing of biotech products, and the procedure will likely remain a service provided by contract labs.

If a need develops to certify that products contain no DNA or protein resulting from genetic modification, a consensus on an acceptable threshold level of detection will be critical—will there be a minimal level of genetically altered material allowed in a sample while still permitting a designation that it contains no biotech products? Current genetic testing methods are so sensitive that in a test for zero tolerance—a guarantee that the product contains no DNA or

protein resulting from genetic modification—nonbiotech products would fail to meet the zero-tolerance standard if they have, for example, had minimal inadvertent contact with biotech products through minor storage and handling overlaps. It would be wise to set minimally acceptable standards high enough that detection by standard methods is meaningful and accounts for variation between testing facilities. Scientific and industrial communities in the U.S. and Europe are currently proposing to set a sample threshold of 1-3 percent genetically engineered material for designation of a product as containing no protein or DNA resulting from genetic modification. **AO**

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Statistical Indicators

Summary Data

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

					1998				1999		
	1997	1998 F	1999 F		I	II	III	IV	I	II	III
Prices received by farmers (1990-92=100)	107	101	--	102	103	101	99	--	--	--	--
Livestock & products	98	96	--	94	96	97	97	--	--	--	--
Crops	116	107	--	110	112	104	101	--	--	--	--
Prices paid by farmers (1990-92=100)											
Production items	117	112	--	115	114	111	110	--	--	--	--
Commodities and services, interest, taxes, and wages	117	115	--	117	116	114	114	--	--	--	--
Cash receipts (\$ bil.)	209	198	198	49	43	48	58	47	43	49	
Livestock	97	93	96	23	23	24	24	23	23	25	
Crops	112	105	102	26	21	24	34	23	20	24	
Market basket (1982-84=100)											
Retail cost	160	--	--	162	162	163	--	--	--	--	--
Farm value	106	--	--	102	104	103	--	--	--	--	--
Spread	189	--	--	194	194	195	--	--	--	--	--
Farm value/retail cost (%)	23	--	--	23	22	22	--	--	--	--	--
Retail Prices (1982-84=100)											
All food	157	161	164	160	160	161	162	163	164	164	164
At home	158	161	164	160	160	161	163	164	164	164	164
Away from home	157	161	165	160	161	162	163	164	165	166	166
Agricultural exports (\$ bil.) ¹	57.3	53.6	49.0	16.3	14.3	12.1	11.1	14.4	12.7	11.2	
Agricultural imports (\$ bil.) ¹	35.8	37.0	38.0	9.2	9.8	9.4	8.7	9.2	9.4	9.4	
Commercial production											
Red meat (mil. lb.)	43,209	45,136	44,316	11,038	11,015	11,380	11,703	11,297	11,088	11,036	
Poultry (mil. lb.)	33,258	33,626	35,170	8,258	8,453	8,375	8,540	8,485	8,870	8,910	
Eggs (mil. doz.)	6,473	6,657	6,820	1,645	1,644	1,658	1,710	1,680	1,685	1,705	
Milk (bil. lb.)	156.6	157.9	160.6	39.2	40.9	38.7	39.1	39.9	41.5	39.5	
Consumption, per capita											
Red meat and poultry (lb.)	208.6	214.9	216.1	51.7	52.3	54.0	56.8	53.8	53.7	53.8	
Corn beginning stocks (mil. bu.) ²	425.9	883.2	1,307.8	883.2	7246.8	4,939.9	3,039.8	1,307.8	8050.22	--	
Corn use (mil. bu.) ²	8,788.6	8,791.0	9,295.0	2,845.4	2,307.8	1,903.7	1,734.0	3022.693	--	--	
Prices ³											
Choice steers--Neb. Direct (\$/cwt)	66.32	61.48	63-68	61.73	64.16	58.97	61.06	62-64	64-68	63-69	
Barrows and gilts--IA, So. MN (\$/cwt)	51.40	31.67	33-35	34.62	39.34	33.22	19.48	25-27	32-34	36-38	
Broilers--12-city (cents/lb.)	58.80	63.10	57-61	56.40	61.00	70.40	64.50	57-59	57-61	58-62	
Eggs--NY gr. A large (cents/doz.)	81.20	75.80	70-75	79.00	66.50	76.00	81.70	75-77	63-67	67-73	
Milk--all at plant \$/cwt)	13.34	15.38	14.05-14.75	14.60	13.73	15.37	17.83	16.55-16.85	13.00-13.60	12.55-13.45	
Wheat--KC HRW ordinary (\$/bu.)	4.16	3.27	--	3.62	3.32	2.86	--	--	--	--	
Corn--Chicago (\$/bu.)	2.78	2.41	--	2.72	2.49	2.03	--	--	--	--	
Soybeans--Chicago (\$/bu.)	7.63	6.01	--	6.68	6.39	5.53	5.44	--	--	--	
Cotton--avg. spot 41-34 (cents/lb)	69.89	67.02	--	64.48	66.86	72.60	64.15	--	--	--	
	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
Farm real estate values ⁴											
Nominal (\$ per acre)	668	683	703	713	736	782	832	890	945	1,000	
Real (1982 \$)	539	528	521	507	511	529	550	574	598	620	

F = Forecast. -- = Not available. 1. Annual data based on Oct.-Sept. fiscal years ending with year indicated. 2. 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. 3. Simple averages, Jan.-Dec. 4. 1990-98 values as of January 1. 1989 values as of February 1.

U.S. & Foreign Economic Data

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

	1997						1998			
	1996	1997	1998	II	III	IV	I	II	III	IV
<i>Billions of current dollars (quarterly data seasonally adjusted at annual rates)</i>										
Gross Domestic Product	7,636.0	8,110.9	8,508.9	8,063.4	8,170.8	8,254.5	8,384.2	8,440.6	8,537.9	8,672.8
Gross National Product	7,674.0	8,102.9	--	8,062.3	8,162.0	8,234.9	8,369.4	8,421.8	8,510.9	--
Personal consumption expenditures	5,207.6	5,493.7	5,806.0	5,438.8	5,540.3	5,593.2	5,676.5	5,773.7	5,846.7	5,927.1
Durable goods	634.5	673.0	723.5	659.9	681.2	682.2	705.1	720.1	718.9	749.8
Nondurable goods	1,534.7	1,600.6	1,662.0	1,588.2	1,611.3	1,613.2	1,633.1	1,655.2	1,670.0	1,689.5
Food	756.1	780.9	814.2	775.8	785.3	787.1	796.9	810.2	818.7	831.1
Clothing and shoes	264.3	278.0	293.7	275.6	280.9	280.7	291.0	295.3	293.7	294.9
Services	3,038.4	3,220.1	3,420.5	3,190.7	3,247.9	3,297.8	3,338.2	3,398.4	3,457.7	3,487.8
Gross private domestic investment	1,116.5	1,256.0	1,369.2	1,259.9	1,265.7	1,292.0	1,366.6	1,345.0	1,364.4	1,400.9
Fixed investment	1,090.7	1,188.6	1,308.8	1,176.4	1,211.1	1,220.1	1,271.1	1,305.8	1,307.5	1,350.9
Change in business inventories	25.9	67.4	60.4	83.5	54.6	71.9	95.5	39.2	57.0	50.0
Net exports of goods and services	-94.8	-93.4	-154.1	-86.8	-94.7	-98.8	-123.7	-159.3	-165.5	-167.8
Government consumption expenditures and gross investment	1,406.7	1,454.6	1,487.8	1,451.5	1,459.5	1,468.1	1,464.9	1,481.2	1,492.3	1,512.6
<i>Billions of 1992 dollars (quarterly data seasonally adjusted at annual rates) ¹</i>										
Gross Domestic Product	6,928.4	7,269.8	7,549.9	7,236.5	7,311.2	7,364.6	7,464.7	7,498.6	7,566.5	7,670.0
Gross National Product	7,008.4	7,266.2	--	7,239.3	7,307.0	7,350.7	7,455.2	7,485.9	7,546.7	--
Personal consumption expenditures	4,714.1	4,913.5	5,151.2	4,872.7	4,947.0	4,981.0	5,055.1	5,130.2	5,181.8	5,237.8
Durable goods	611.1	668.6	735.9	653.8	679.6	684.8	710.3	729.4	733.7	770.1
Nondurable goods	1,432.3	1,486.3	1,543.1	1,477.1	1,495.7	1,494.3	1,521.2	1,540.9	1,549.1	1,561.4
Food	689.7	699.3	717.0	697.3	700.6	699.9	706.8	716.3	718.9	726.1
Clothing and shoes	267.7	288.4	310.3	283.3	291.9	292.3	307.4	311.4	309.8	312.5
Services	2,671.0	2,761.5	2,879.4	2,743.6	2,775.4	2,804.8	2,829.3	2,866.8	2,904.8	2,916.8
Gross private domestic investment	1,069.1	1,206.4	1,332.4	1,211.3	1,215.8	1,241.9	1,321.8	1,306.5	1,331.6	1,369.8
Fixed investment	1,041.7	1,138.0	1,268.9	1,127.0	1,159.3	1,169.5	1,224.9	1,264.1	1,270.9	1,315.6
Change in business inventories	25.0	63.2	58.5	79.0	51.0	66.5	91.4	38.2	55.7	48.9
Net exports of goods and services	-114.4	-136.1	-241.4	-131.6	-142.4	-149.0	-198.5	-245.2	-259.0	-262.9
Government consumption expenditures and gross investment	1,257.9	1,285.0	1,297.5	1,284.4	1,288.9	1,289.2	1,283.0	1,294.8	1,299.6	1,312.7
GDP implicit price deflator (% change)	1.9	1.9	1.0	1.6	1.2	1.2	0.8	0.9	1.0	0.8
Disposable personal income (\$ bil.)	5,534.7	5,795.1	6,025.5	5,767.9	5,821.8	5,879.4	5,937.1	5,988.9	6,052.4	6,123.6
Disposable pers. income (1992 \$ bil.)	5,043.0	5,183.1	5,346.1	5,167.5	5,198.4	5,235.8	5,287.1	5,321.5	5,364.1	5,411.5
Per capita disposable pers. income (\$)	20,840	21,633	22,299	21,558	21,709	21,871	22,046	22,192	22,373	22,584
Per capita disp. pers. income (1992 \$)	18,989	19,349	19,785	19,315	19,385	19,478	19,632	19,719	19,829	19,958
U.S. resident population plus Armed Forces overseas (mil.) ²	265.5	267.9	270.3	267.5	268.1	268.9	269.3	269.9	270.5	271.2
Civilian population (mil.) ²	263.9	266.4	268.8	266.0	266.6	267.3	267.8	268.4	269.0	269.7
<i>Monthly data seasonally adjusted</i>										
	1996	1997	1998	Dec	Jul	Aug	Sep	Oct	Nov	Dec
Total industrial production (1992=100)	121.4	129.7	135.1	133.7	133.6	135.7	135.2	136.3	136.5	136.7
Leading economic indicators (1992=100)	102.1	103.9	106.5	104.6	105.6	105.7	105.6	105.7	106.2	106.5
Civilian employment (mil. persons) ³	126.7	129.6	131.5	130.8	131.2	131.3	131.8	131.9	132.1	132.5
Civilian unemployment rate (%) ³	5.4	4.9	4.5	4.7	4.5	4.5	4.5	4.5	4.4	4.3
Personal income (\$ bil. annual rate)	6,425.2	6,784.0	7,123.6	6,928.3	7,133.7	7,164.1	7,184.6	7,215.2	7,245.1	7,283.5
Money stock-M2 (daily avg.) (\$ bil.) ⁴	3,823.9	4,046.6	4,412.9	4,046.4	4,217.2	4,245.7	4,292.3	4,335.7	4,375.2	4,412.9
Three-month Treasury bill rate (%)	5.02	5.07	4.81	5.16	4.96	4.94	4.74	4.08	4.44	4.42
AAA corporate bond yield (Moody's) (%)	7.37	7.26	6.53	6.76	6.55	6.52	6.40	6.37	6.41	6.22
Total housing starts (1,000) ⁵	1,476.8	1,474.0	1,615.6	1,540	1,704	1,621	1,569	1,693	1,662	1,720
Business inventory/sales ratio ⁶	1.40	1.38	--	1.38	1.38	1.39	1.39	1.39	1.39	--
Sales of all retail stores (\$ bil.) ⁷	2,465.1	2,546.3	--	216.9	224.2	224.3	225.1	227.9	229.5	231.7
Nondurable goods stores (\$ bil.)	1,457.8	1,505.4	--	126.2	131.0	131.0	131.1	131.9	132.7	133.1
Food stores (\$ bil.)	424.2	432.1	--	36.0	37.0	37.2	37.2	37.4	37.5	37.9
Apparel and accessory stores (\$ bil.)	113.0	116.8	--	10.0	10.5	10.4	10.1	10.3	10.4	10.4
Eating and drinking places (\$ bil.)	238.4	244.1	--	19.9	20.4	20.4	20.7	21.1	21.3	21.4

-- = Not available. 1. In April 1996, 1992 dollars replaced 1987 dollars. 2. Population estimates based on 1990 census. 3. Data beginning January 1994 are 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									
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
<i>Real GDP, annual percent change</i>										
World	1.9	1.9	1.6	3.2	2.8	3.6	3.5	2.0	2.0	2.6
less U.S.	2.9	1.6	1.3	3.1	2.9	3.6	3.3	1.3	1.5	3.2
Developed Economies	1.7	1.6	0.8	2.8	2.2	3.0	2.9	2.0	1.9	2.0
less U.S.	3.1	1.0	0.0	2.5	2.1	2.8	2.4	1.1	1.2	2.6
United States	-0.9	2.7	2.3	3.5	2.3	3.4	3.9	3.9	3.2	1.0
Canada	-1.9	0.9	2.3	4.7	2.6	1.2	3.8	2.8	2.6	3.3
Japan	3.8	1.0	0.3	0.7	1.4	5.2	1.4	-3.1	-0.9	2.4
Australia	-1.1	2.5	3.5	5.5	3.7	3.9	3.9	4.5	2.3	3.3
European Union	3.7	1.0	-0.6	3.0	2.4	1.8	2.7	2.8	2.0	2.5
Transition Economies	-6.9	-11.2	-6.5	-8.8	-1.5	-2.2	1.0	-2.3	-7.3	1.7
Eastern Europe	-10.6	-4.0	0.8	3.5	5.5	3.1	1.7	2.4	2.3	3.7
Poland	-6.3	2.0	3.8	4.2	7.1	5.9	7.0	5.9	4.5	5.0
Former Soviet Union	-5.5	-13.7	-9.3	-13.9	-5.1	-5.1	0.5	-5.3	-13.8	0.0
Russia	-5.0	-14.5	-8.7	-12.6	-4.1	-4.9	0.8	-5.8	-15.0	-0.2
Developing Economies	4.8	6.3	6.3	6.7	5.7	6.3	5.8	2.2	3.2	4.7
Asia	6.6	8.9	8.7	9.4	8.7	7.9	6.7	2.3	4.4	5.8
East Asia	8.8	10.9	10.7	10.7	9.3	8.4	7.8	4.6	6.4	6.6
China	9.3	14.2	13.5	12.6	10.5	9.6	8.8	7.8	8.0	7.4
Taiwan	7.5	6.8	6.3	6.5	6.0	5.7	6.8	4.9	4.0	5.1
Korea	9.2	5.1	5.8	8.6	9.0	7.1	5.5	-5.8	3.0	4.8
Southeast Asia	6.8	6.9	7.4	8.1	8.5	7.3	4.9	-6.7	-1.7	4.1
Indonesia	8.9	7.2	7.2	7.5	8.2	7.6	5.1	-14.7	-6.9	4.3
Malaysia	8.8	7.8	8.4	9.4	9.5	8.0	7.8	-6.6	-0.6	5.7
Philippines	-0.2	0.3	2.1	4.4	4.8	5.7	5.1	-0.1	-1.3	2.7
Thailand	8.0	8.1	8.3	8.8	9.2	6.4	-0.4	-8.0	0.5	4.0
South Asia	1.2	5.6	4.6	7.0	6.9	7.1	5.1	3.7	3.1	4.4
India	0.5	5.4	4.9	7.5	7.3	7.5	5.4	4.0	3.5	4.7
Pakistan	5.5	7.8	1.9	3.9	5.1	4.6	3.0	2.0	1.0	2.5
Latin America	3.8	3.0	3.9	5.1	0.1	3.4	5.0	2.0	0.2	2.3
Mexico	4.2	3.6	2.0	4.5	-6.3	5.2	7.0	4.7	2.2	2.6
Caribbean/Central	4.2	7.9	4.9	3.8	3.1	3.3	0.7	4.0	3.6	2.3
South America	3.6	2.7	4.5	5.3	1.8	3.0	4.7	1.2	-0.4	2.3
Argentina	8.9	8.6	6.0	7.4	-4.6	4.4	8.2	4.2	1.8	3.0
Brazil	0.5	-1.2	4.5	5.8	3.0	2.9	2.9	-0.1	-2.6	1.0
Colombia	2.3	4.0	5.5	5.9	5.3	2.0	3.0	2.3	1.6	3.5
Venezuela	9.7	6.1	0.3	-2.9	3.4	-1.6	6.4	-3.0	0.0	4.0
Middle East	2.9	5.5	3.5	0.3	3.5	4.5	3.9	1.2	1.7	3.5
Israel	7.7	5.6	5.6	6.9	7.0	4.6	2.3	1.5	1.8	2.8
Saudi Arabia	8.4	2.8	-0.6	0.5	0.5	2.4	0.9	-1.0	0.5	2.0
Turkey	0.9	6.0	8.0	-5.5	7.0	7.0	7.6	4.0	3.0	5.5
Africa	0.7	1.2	1.3	2.7	2.8	4.7	3.0	3.5	3.4	3.7
North Africa	1.0	2.2	0.1	2.8	2.4	5.6	2.4	4.9	4.3	4.1
Egypt	1.1	4.4	2.9	3.9	4.6	5.0	5.0	5.0	4.7	4.4
Sub-Saharan	0.5	0.3	2.5	2.6	3.2	4.0	3.6	2.2	2.5	3.4
South Africa	-1.0	-2.6	1.5	2.8	3.1	3.3	1.7	0.8	2.2	2.8
<i>Consumer Prices, percent change</i>										
Developed Economies	4.7	3.5	3.1	2.6	2.5	2.4	2.1	1.6	1.6	--
Transition Economies	95.8	656.6	609.3	268.4	124.1	41.4	27.9	21.0	30.2	--
Developing Economies	36.4	38.7	47.3	51.6	22.3	14.1	9.2	10.2	8.4	--
Asia	8.2	7.2	11.1	15.9	12.8	7.9	4.7	7.9	6.4	--
Latin America	129.0	151.4	208.5	208.3	35.9	20.8	13.9	10.3	8.3	--
Middle East	27.5	25.6	24.6	31.9	35.9	24.6	22.8	23.6	20.5	--
Africa	24.4	32.4	30.8	37.5	34.1	26.7	11.0	8.5	7.8	--

The last three years are either estimates or forecasts. Sources: Oxford Economic Forecasting; International Financial Statistics, IMF.

Information contact: Andy Jerardo (202) 694-5323

Farm Prices

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

	Annual			1998						1999
	1995	1996	1997	Jan	Aug	Sep	Oct	Nov	Dec	Jan
1990-92=100										
Prices received										
All farm products	102	112	107	103	101	99	99	100	99	98
All crops	112	126	115	110	104	101	100	102	100	98
Food grains	134	157	128	116	85	88	100	105	101	102
Feed grains and hay	112	146	117	113	91	86	85	86	89	89
Cotton	127	122	112	101	109	111	110	107	100	98
Tobacco	103	105	104	110	93	103	107	109	110	109
Oil-bearing crops	104	128	130	119	98	93	93	101	102	94
Fruit and nuts, all	100	118	109	80	142	131	126	119	99	101
Commercial vegetables	120	109	120	125	111	112	134	111	110	120
Potatoes and dry beans	107	114	93	99	93	89	82	89	93	93
Livestock and products	92	99	99	94	98	97	98	97	97	96
Meat animals	85	87	92	84	78	73	75	72	66	75
Dairy products	98	114	102	113	118	127	135	137	138	136
Poultry and eggs	107	120	114	105	132	128	127	124	120	114
Prices paid										
Commodities and services,										
interest, taxes, and wage rates	110	115	116	117	114	113	114	114	113	114
Production items	109	115	116	116	111	110	110	110	110	111
Feed	104	130	122	117	101	96	95	96	96	97
Livestock and poultry	82	75	93	94	83	80	85	86	85	90
Seeds	110	115	119	120	123	123	123	123	123	123
Fertilizer	120	124	121	115	112	111	110	108	107	105
Agricultural chemicals	115	119	121	123	122	122	123	122	122	122
Fuels	94	105	103	99	83	86	86	83	72	62
Supplies and repairs	112	115	117	118	119	119	120	120	120	120
Autos and trucks	107	108	109	119	118	118	118	119	119	120
Farm machinery	120	125	128	130	132	132	133	133	133	133
Building material	114	115	118	118	119	118	118	118	118	118
Farm services	118	118	118	116	117	117	116	116	116	116
Rent	116	119	119	124	124	124	124	124	124	130
Int. payable per acre on farm real estate debt	101	105	106	108	108	108	108	108	108	111
Taxes payable per acre on farm real estate	109	112	115	119	119	119	119	119	119	122
Wage rates (seasonally adjusted)	114	117	123	131	125	125	131	131	131	131
Production items, interest, taxes, and wage rates	109	114	116	117	113	111	112	112	112	113
Ratio, prices received to prices paid (%)*	93	98	92	88	89	88	87	88	88	86
Prices received (1910-14=100)	647	712	679	653	643	630	630	633	626	620
Prices paid, etc. (parity index) (1910-14=100)	1,437	1,504	1,527	1,561	1,519	1,507	1,517	1,516	1,511	1,522
Parity ratio (1910-14=100) (%)*	45	47	45	42	42	42	42	42	41	41

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. Data for this table is taken from the publication *Agricultural Prices*, which is produced monthly by USDA's National Agricultural Statistics Service (NASS) and is available at <http://jan.mannlib.cornell.edu/reports/nassr/price/pap-bb>. For historical data or for categories not listed here, call the National Agricultural Statistics Service (NASS) Information Hotline at 1-800-727-9540, or access the NASS Home Page at <http://www.usda.gov/nass>.

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

	Annual ¹			1998						1999
	1995	1996	1997	Jan	Aug	Sep	Oct	Nov	Dec	Jan
Crops										
All wheat (\$/bu.)	4.55	4.30	3.45	3.32	2.39	2.41	2.79	2.97	2.87	2.86
Rice, rough (\$/cwt)	9.15	9.96	9.64	9.57	8.95	9.35	9.25	8.98	9.06	9.12
Corn (\$/bu.)	3.24	2.71	2.60	2.56	1.90	1.83	1.91	1.93	2.01	2.01
Sorghum (\$/cwt)	5.69	4.17	4.00	4.02	3.32	2.91	2.96	3.05	2.98	3.01
All hay, baled (\$/ton)	82.20	95.80	102.50	94.70	88.50	86.50	85.20	81.40	78.40	78.80
Soybeans (\$/bu.)	6.72	7.35	6.50	6.69	5.43	5.25	5.18	5.40	5.37	5.22
Cotton, upland (¢/lb.)	75.40	69.30	66.90	61.10	66.20	67.10	66.40	65.10	60.70	59.10
Potatoes (\$/cwt)	6.77	4.93	5.68	5.55	5.30	4.92	4.47	4.81	5.20	5.24
Lettuce (\$/cwt) ⁴	23.50	14.70	17.30	19.00	16.20	14.00	21.30	9.82	11.90	9.59
Tomatoes fresh (\$/cwt) ⁴	25.80	28.00	33.00	31.10	20.40	27.20	43.10	42.90	45.00	63.40
Onions (\$/cwt)	11.10	10.60	12.60	13.20	15.10	12.90	12.70	13.90	16.00	16.90
Beans, dry edible (\$/cwt)	20.80	23.50	17.70	21.10	19.80	19.30	19.60	20.80	20.50	19.50
Apples for fresh use (¢/lb.)	24.00	20.80	22.20	21.90	19.00	22.70	22.80	17.90	15.20	15.90
Pears for fresh use (\$/ton)	272.00	376.00	276.00	269.00	457.00	420.00	479.00	398.00	354.00	373.00
Oranges, all uses (\$/box) ³	4.23	5.01	4.57	3.15	5.37	4.97	5.42	5.87	4.74	5.15
Grapefruit, all uses (\$/box) ³	2.30	2.43	1.74	1.01	6.01	11.09	3.88	3.19	2.70	1.80
Livestock										
Cattle, all beef (\$/cwt)	61.80	58.70	63.10	62.50	57.40	56.10	58.00	58.10	56.80	59.00
Calves (\$/cwt)	73.10	58.40	78.90	86.60	76.90	74.10	75.70	77.50	80.20	81.90
Hogs, all (\$/cwt)	40.50	51.90	52.90	36.00	35.10	29.50	27.40	18.70	14.70	25.70
Lambs (\$/cwt)	78.20	88.20	90.30	78.40	79.90	71.40	67.30	62.20	64.50	--
All milk, sold to plants (\$/cwt)	12.78	14.75	13.36	14.70	15.40	16.60	17.60	17.90	18.00	17.70
Milk, manuf. grade (\$/cwt)	11.79	13.43	12.17	13.50	14.60	15.40	16.70	17.30	17.40	16.10
Broilers, live (¢/lb.)	34.40	38.10	37.70	33.10	46.90	45.90	43.90	41.50	39.00	37.90
Eggs, all (¢/doz.) ²	62.40	74.90	70.20	74.00	64.90	63.40	66.40	72.80	75.80	71.90
Turkeys (¢/lb.)	41.00	43.30	39.90	35.50	38.80	40.20	42.80	44.00	41.10	34.80

-- = 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. Data for this table is taken from the publication *Agricultural Prices*, which is produced monthly by USDA's National Agricultural Statistics Service (NASS) and is available at <http://jan.mannlib.cornell.edu/reports/nassr/price/pap-bb>. For historical data or for categories not listed here, call the National Agricultural Statistics Service (NASS) Information Hotline at 1-800-727-9540, or 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			1998						1999
	1996	1997	1998	Jan	Aug	Sep	Oct	Nov	Dec	Jan
<i>1982-84=100</i>										
Consumer Price Index, all items	156.9	160.5	163.0	161.6	163.4	163.6	164.0	164.0	163.9	164.3
CPI, all items less food	157.5	161.1	163.6	161.9	163.9	164.1	164.4	164.3	164.2	164.5
All food	153.3	157.3	160.7	159.9	161.0	161.1	162.0	162.1	162.3	163.6
Food away from home	152.7	157.0	161.1	159.2	161.5	162.1	162.3	162.6	163.0	163.5
Food at home	154.3	158.1	161.1	161.0	161.4	161.2	162.5	162.5	162.6	164.3
Meats ¹	140.2	144.4	141.6	143.2	142.2	141.6	141.3	141.4	140.2	139.4
Beef and veal	134.5	136.8	136.5	136.8	137.0	136.3	136.1	137.0	137.1	136.0
Pork	148.2	155.9	148.5	152.1	149.9	148.7	147.5	146.2	144.1	141.9
Poultry	152.4	156.6	157.1	155.1	158.9	159.3	161.1	159.6	159.3	158.5
Fish and seafood	173.1	177.1	181.7	180.7	183.5	181.5	183.1	183.1	183.7	183.6
Eggs	142.1	140.0	135.4	143.8	135.4	132.4	136.1	139.4	142.9	137.8
Dairy products ²	142.1	145.5	150.8	148.3	150.5	152.9	155.0	155.9	157.6	161.2
Fats and oils ³	140.5	141.7	146.9	140.5	149.7	152.4	156.8	155.1	151.9	150.5
Fresh fruits	234.4	236.3	246.5	240.2	248.7	247.6	251.8	249.6	258.7	267.4
Fresh vegetables	189.2	194.6	215.8	233.8	205.6	200.1	213.9	214.9	212.3	224.5
Potatoes	180.6	174.2	185.2	180.2	192.7	189.1	187.0	176.7	178.0	184.5
Cereals and bakery products	174.0	177.6	181.1	179.0	182.7	181.9	182.2	182.1	182.3	184.2
Sugar and sweets	143.7	147.8	150.2	150.3	150.2	150.8	150.5	149.6	150.1	151.7
Nonalcoholic beverages ⁴	128.6	133.4	133.0	134.1	132.0	132.2	132.6	132.7	131.7	133.5
Apparel										
Footwear	126.6	127.6	128.0	127.4	127.7	128.6	130.3	130.4	127.5	125.6
Tobacco and smoking products	232.8	243.7	274.8	253.8	273.7	283.5	284.9	281.3	331.2	354.2
Alcoholic beverages	158.5	162.8	165.7	164.6	165.7	166.3	166.6	166.8	167.2	167.6

1. Beef, veal, lamb, pork, and processed meat. 2. Included butter through Dec. '97. 3. Includes butter as of Jan. '98. 4. Includes fruit juices as of Jan. '98.

This table is compiled with data provided by the Bureau of Labor Statistics (BLS). BLS operates a website at <http://stats.bls.gov/blshome.html> and a Consumer Prices Information Hotline at (202) 606-7828.

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

	Annual			1998						1999
	1996	1997	1998	Jan	Aug	Sep	Oct	Nov	Dec	Jan
	1982=100									
All commodities	127.7	127.6	124.4	125.4	124.2	123.8	124.0	123.5	122.7	123.2
Finished goods ¹	131.3	131.8	130.6	130.3	130.7	130.6	131.4	130.8	131.0	131.5
All foods ²	132.5	132.8	132.4	130.9	133.3	133.5	133.7	133.0	132.3	133.6
Consumer foods	133.6	134.5	134.3	133.1	135.2	135.4	135.5	134.7	134.3	135.6
Fresh fruits and melons	100.8	99.4	90.0	89.2	91.8	92.3	91.7	85.4	86.6	103.6
Fresh and dry vegetables	135.0	123.1	139.5	143.1	116.4	130.8	148.4	124.5	137.9	124.4
Dried and dehydrated fruits	124.2	124.9	124.4	124.8	125.6	125.5	124.3	122.3	121.8	122.6
Canned fruits and juices	137.5	137.6	134.4	133.9	134.4	133.4	132.8	135.4	136.6	136.7
Frozen fruits, juices and ades	123.9	117.2	116.1	110.4	116.4	117.2	117.2	123.7	125.0	121.8
Fresh veg. except potatoes	120.9	121.3	137.9	133.1	114.9	135.0	161.9	131.2	148.1	131.9
Canned vegetables and juices	121.2	120.1	121.5	121.2	122.0	120.0	120.2	120.7	119.7	120.8
Frozen vegetables	125.4	125.8	125.4	125.2	125.6	125.3	126.0	125.6	125.1	125.6
Potatoes	133.9	106.1	122.5	116.5	106.5	147.5	126.0	120.7	120.7	132.3
Eggs for fresh use (1991=100)	105.1	97.1	90.1	98.3	91.3	88.9	92.0	100.3	102.9	94.0
Bakery products	169.8	173.9	175.8	175.3	175.9	175.9	176.2	176.3	176.7	177.4
Meats	109.0	111.6	101.4	102.4	104.6	100.0	98.1	97.3	95.6	100.0
Beef and veal	100.2	102.8	99.5	99.5	100.8	97.2	96.9	99.9	98.5	101.4
Pork	120.9	123.1	96.6	98.5	104.9	96.2	90.8	83.9	80.6	90.6
Processed poultry	119.8	117.4	120.7	113.6	128.4	129.4	126.0	122.0	117.1	114.9
Unprocessed and packaged fish	165.9	178.1	183.0	187.4	179.8	178.7	181.3	185.4	174.9	184.7
Dairy products	130.4	128.1	138.1	130.1	140.1	145.7	148.0	148.6	148.5	149.0
Processed fruits and vegetables	127.6	126.4	125.8	124.8	126.2	125.2	125.2	126.6	126.7	126.8
Shortening and cooking oil	138.5	137.8	143.4	140.0	149.0	151.0	142.7	143.5	148.2	--
Soft drinks	134.0	133.2	134.8	134.4	134.7	134.8	135.0	134.7	134.9	135.4
Finished consumer goods less foods	127.6	128.2	126.4	126.1	126.4	126.3	127.1	126.3	126.9	127.5
Alcoholic beverages	132.8	135.1	135.2	135.1	134.8	134.7	135.0	136.4	136.4	136.8
Apparel	125.1	125.7	126.6	126.6	126.5	126.9	126.7	126.6	126.7	126.8
Footwear	141.6	143.7	144.7	144.5	144.6	144.7	144.7	144.9	145.2	145.2
Tobacco products	237.4	248.9	283.4	257.5	286.4	287.4	287.4	288.1	363.9	363.0
Intermediate materials ³	125.8	125.6	123.0	124.2	123.2	122.9	122.3	121.8	121.1	121.2
Materials for food manufacturing	125.3	123.2	123.1	119.9	124.6	125.1	125.3	125.3	123.9	124.6
Flour	136.8	118.7	109.2	109.5	104.3	103.3	109.1	110.4	107.1	106.8
Refined sugar ⁴	123.7	123.6	119.8	119.4	119.5	120.3	119.9	119.6	119.7	118.5
Crude vegetable oils	118.1	116.6	131.1	126.1	127.9	131.2	124.3	131.0	121.5	123.7
Crude materials ⁵	113.8	111.1	96.7	101.7	94.3	92.1	93.9	92.9	88.8	90.9
Foodstuffs and feedstuffs	121.5	112.2	103.8	105.5	103.3	101.3	103.4	102.4	97.2	101.6
Fruits and vegetables and nuts ⁶	122.5	115.5	117.2	118.0	108.9	114.9	121.5	109.3	115.6	120.6
Grains	151.1	111.2	93.4	104.4	82.5	76.3	84.6	88.5	87.7	87.0
Slaughter livestock	95.2	96.3	82.3	85.6	82.1	79.0	78.7	74.9	67.3	79.3
Slaughter poultry, live	140.5	131.0	141.4	116.9	167.8	164.1	161.8	151.4	136.2	129.5
Plant and animal fibers	129.4	117.0	110.4	104.1	115.8	117.8	112.6	110.9	97.7	93.5
Fluid milk	107.9	97.5	112.6	105.9	115.8	123.3	126.2	130.6	133.5	130.4
Oilseeds	139.4	140.8	114.4	123.9	104.6	101.0	103.0	108.8	105.5	103.2
Leaf tobacco	89.4	--	104.6	112.9	95.2	105.2	109.6	106.4	112.6	112.4
Raw cane sugar	118.6	116.8	117.2	116.6	118.2	118.2	115.6	116.5	117.9	119.0

-- = Not available. 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.

This table is compiled with data provided by the Bureau of Labor Statistics (BLS). BLS operates a website at <http://stats.bls.gov/blshtml> and a Producer Prices Information Hotline at (202) 606-7705.

Farm-Retail Price Spreads

Table 8—Farm-Retail Price Spreads

	Annual			1997		1998				
	1995	1996	1997	Dec	Jul	Aug	Sep	Oct	Nov	Dec
Market basket¹										
Retail cost (1982-84=100)	149.4	155.9	159.7	161.0	162.6	163.4	163.2	164.8	164.7	165.6
Farm value (1982-84=100)	102.7	111.1	106.2	105.5	102.6	103.1	104.7	106.3	104.2	101.4
Farm-retail spread (1982-84=100)	174.6	180.1	188.6	191.0	194.9	195.9	194.7	196.3	197.3	200.2
Farm value-retail cost (%)	24.1	24.9	23.3	22.9	22.1	22.1	22.5	22.6	22.2	21.4
Meat products										
Retail cost (1982-84=100)	135.5	140.1	144.4	143.4	141.8	142.2	141.6	141.3	141.4	140.2
Farm value (1982-84=100)	93.8	100.4	101.2	94.8	89.1	85.4	81.3	79.3	76.9	70.7
Farm-retail spread (1982-84=100)	178.2	180.9	188.6	193.3	195.9	200.4	203.5	204.9	207.6	211.5
Farm value-retail cost (%)	35.1	36.3	35.5	33.5	31.8	30.4	29.1	28.4	27.6	25.5
Dairy products										
Retail cost (1982-84=100)	132.8	142.1	145.5	147.8	148.2	150.5	152.9	155.0	155.9	157.6
Farm value (1982-84=100)	92.2	107.2	98.0	104.0	103.2	113.9	125.4	126.2	125.6	127.1
Farm-retail spread (1982-84=100)	170.3	174.3	189.3	188.2	189.7	184.3	178.3	181.6	183.8	185.7
Farm value-retail cost (%)	33.3	36.2	32.3	33.8	33.4	36.3	39.3	39.1	38.7	38.7
Poultry										
Retail cost (1982-84=100)	143.5	152.4	156.6	155.2	156.6	158.9	159.3	161.1	159.6	159.3
Farm value (1982-84=100)	113.7	126.2	120.6	105.7	135.3	145.9	143.9	139.7	133.8	125.6
Farm-retail spread (1982-84=100)	177.7	182.6	198.1	212.2	181.2	173.9	177.1	185.7	189.3	198.1
Farm value-retail cost (%)	42.4	44.3	41.2	36.4	46.2	49.1	48.3	46.4	44.9	42.2
Eggs										
Retail cost (1982-84=100)	120.5	142.1	140.0	151.1	127.5	135.4	132.4	136.1	139.4	142.9
Farm value (1982-84=100)	91.1	114.7	99.3	116.9	74.2	88.3	85.2	91.4	104.9	108.1
Farm-retail spread (1982-84=100)	173.2	191.4	213.0	212.6	223.2	220.0	217.1	216.3	201.5	205.4
Farm value-retail cost (%)	48.6	51.9	45.6	49.7	37.4	41.9	41.4	43.2	48.3	48.6
Cereal and bakery products										
Retail cost (1982-84=100)	167.5	174.0	177.6	178.4	181.8	182.7	181.9	182.2	182.1	182.3
Farm value (1982-84=100)	110.1	125.6	107.7	103.8	88.7	84.8	85.6	92.4	95.6	95.0
Farm-retail spread (1982-84=100)	175.5	180.7	187.4	188.8	194.8	196.4	195.3	194.7	194.2	194.5
Farm value-retail cost (%)	8.1	7.2	7.4	7.1	6.0	5.7	5.8	6.2	6.4	6.4
Fresh fruit										
Retail cost (1982-84=100)	226.9	243.0	245.1	250.1	255.7	259.2	260.6	265.9	262.7	283.5
Farm value (1982-84=100)	136.2	151.7	137.0	159.0	132.3	136.0	152.3	158.9	140.6	138.5
Farm-retail spread (1982-84=100)	268.7	285.2	295.0	292.1	312.7	316.0	310.6	315.3	319.1	350.4
Farm value-retail cost (%)	19.0	19.7	17.7	20.1	16.3	16.6	18.5	18.9	16.9	15.4
Fresh vegetables										
Retail cost (1982-84=100)	193.1	189.2	194.6	205.2	214.0	205.6	200.1	213.9	214.9	212.3
Farm value (1982-84=100)	130.1	113.3	118.7	122.7	134.3	104.2	103.0	132.4	123.1	120.6
Farm-retail spread (1982-84=100)	225.5	228.3	233.6	247.6	255.0	257.7	250.0	255.8	262.1	259.4
Farm value-retail cost (%)	22.9	20.3	20.7	20.3	21.3	17.2	17.5	21.0	19.5	19.3
Processed fruits and vegetables										
Retail cost (1982-84=100)	137.5	144.4	147.9	147.2	151.8	152.5	152.1	151.6	150.7	150.4
Farm value (1982-84=100)	120.5	121.5	115.9	115.1	114.0	113.3	115.1	115.2	115.6	116.0
Farm-retail spread (1982-84=100)	142.8	151.6	157.9	157.2	163.6	164.7	163.7	163.0	161.7	161.1
Farm value-retail cost (%)	20.8	20.0	18.6	18.6	17.9	17.7	18.0	18.1	18.2	18.3
Fats and oils										
Retail cost (1982-84=100)	137.3	140.5	141.7	140.3	147.6	149.7	152.4	156.8	155.1	151.9
Farm value (1982-84=100)	121.3	112.3	109.4	114.3	114.9	112.9	120.5	117.5	117.8	111.5
Farm-retail spread (1982-84=100)	143.1	150.9	153.6	149.9	159.6	163.2	164.1	171.3	168.8	166.8
Farm value-retail cost (%)	23.8	21.5	20.8	21.9	20.9	20.3	21.3	20.1	20.4	19.7

See footnotes at end of table, next page.

Table 8—Farm-Retail Price Spreads (continued)

	1996	1997	1998	Jan	Aug	Sep	Oct	Nov	Dec	Jan
Beef, All Fresh Retail Price (cts/lb)	252.4	253.8	253.3	253.2	255.1	250.0	251.9	252.9	253.8	253.5
Beef, Choice										
Retail price (cents/lb.) ²	280.2	279.5	277.1	275.3	279.4	274.2	275.0	280.0	283.6	279.1
Wholesale value (cents) ³	158.1	158.2	153.8	154.2	160.6	153.2	156.4	158.1	150.4	156.3
Net farm value (cents) ⁴	134.9	137.2	130.8	135.8	126.1	124.6	130.9	131.5	125.5	130.1
Farm-retail spread (cents)	145.3	142.3	146.3	139.5	153.3	149.6	144.1	148.5	158.1	149.0
Wholesale-retail (cents) ⁵	122.1	121.3	123.3	121.1	118.8	121.0	118.6	121.9	133.2	122.8
Farm-wholesale (cents) ⁶	23.2	21.0	23.0	18.4	34.5	28.6	25.5	26.6	24.9	26.2
Farm value-retail price (%)	48	49	47	49	45	45	48	47	44	47
Pork										
Retail price (cents/lb.) ²	233.7	245.0	242.7	248.4	245.0	244.7	242.2	241.0	238.1	233.4
Wholesale value (cents) ³	123.2	123.1	97.3	101.1	100.9	96.2	93.3	84.6	81.1	95.6
Net farm value (cents) ⁴	99.4	95.3	61.2	67.5	66.9	56.4	52.1	35.0	29.3	50.7
Farm-retail spread (cents)	134.3	149.6	181.5	180.9	178.1	188.3	190.1	206.0	208.8	182.7
Wholesale-retail (cents) ⁵	110.5	121.9	145.4	147.3	144.1	148.5	148.9	156.4	157.0	137.8
Farm-wholesale (cents) ⁶	23.8	27.7	36.1	33.6	34.0	39.8	41.2	49.6	51.8	44.9
Farm value-retail price (%)	43	39	25	27	27	23	22	15	12	22

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 contact: Veronica Jones (202) 694-5387, Larry Duewer (202) 694-5172*

Note: Pork price and spread procedures have been revised (January 1999) and historical data made consistent with the updated series.

For the complete updated series call Larry Duewer.

Table 9—Price Indexes of Food Marketing Costs

	Annual			1997			1998			
	1995	1996	1997	II	III	IV	I	II	III	IV
<i>1987=100*</i>										
Labor—hourly earnings										
and benefits	455.2	459.7	474.3	473.0	474.6	480.2	484.9	488.3	493.0	494.6
Processing	472.5	474.7	486.0	484.9	487.1	490.5	493.8	497.7	500.7	504.8
Wholesaling	502.2	516.0	536.2	534.1	538.9	545.4	546.8	552.5	555.4	554.9
Retailing	417.1	419.9	435.2	434.1	433.6	441.1	448.7	450.6	457.8	459.6
Packaging and containers	415.7	399.8	390.3	388.7	387.6	392.9	398.5	396.7	394.9	391.9
Paperboard boxes and containers	392.1	363.8	341.9	335.4	334.7	350.3	365.4	368.7	366.8	359.8
Metal cans	504.9	498.3	491.0	496.1	490.8	487.9	494.1	484.7	486.0	486.6
Paper bags and related products	457.8	437.8	441.9	441.6	439.5	442.5	438.8	434.0	430.2	428.5
Plastic films and bottles	330.6	326.5	326.6	325.3	326.9	327.5	326.7	325.0	321.0	318.5
Glass containers	463.3	460.5	447.4	446.9	446.6	446.6	446.9	446.9	446.1	447.3
Metal foil	263.1	235.7	233.4	232.0	237.2	236.4	231.8	232.6	232.6	230.9
Transportation services	436.6	429.8	430.0	430.6	429.0	429.4	429.9	431.8	426.3	425.0
Advertising	539.1	580.1	609.4	608.7	609.3	611.6	623.2	624.2	624.5	626.2
Fuel and power	633.7	670.7	668.5	657.4	658.1	669.0	625.1	622.9	629.2	601.6
Electric	511.3	501.3	499.2	499.0	517.7	491.5	482.2	489.3	511.8	485.0
Petroleum	559.7	666.8	616.7	609.7	574.8	609.6	495.5	470.0	439.2	423.3
Natural gas	1,091.7	1,136.7	1,214.0	1,165.7	1,179.7	1,249.4	1,229.4	1,242.1	1,268.5	1,217.7
Communications, water and sewage	284.9	296.8	302.8	302.2	303.5	304.2	305.5	308.0	308.5	308.5
Rent	269.0	268.2	265.6	265.6	265.1	265.1	262.5	260.4	260.4	265.1
Maintenance and repair	486.1	499.6	514.9	513.0	517.3	519.7	524.1	527.1	531.1	535.1
Business services	491.0	501.7	512.3	511.7	513.9	514.1	518.4	521.2	521.8	522.7
Supplies	342.7	338.3	337.8	337.0	337.5	337.9	335.6	332.4	331.4	329.5
Property taxes and insurance	546.8	564.3	580.1	577.3	582.2	587.3	591.1	595.4	600.7	606.1
Interest, short-term	113.5	103.9	108.9	111.2	108.8	110.1	106.5	106.7	105.6	96.0
Total marketing cost index	444.8	452.1	459.9	458.4	459.1	463.4	465.3	466.9	468.6	467.9

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		Conversion factor ³	Primary market price ⁴
							Total	Per capita ²		
				<i>Million lbs.⁵</i>				<i>lbs.</i>		<i>\$/cwt</i>
Beef										
1995	548	25,222	2,103	27,873	1,821	519	25,533	67	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	25,762	2,611	28,838	2,158	395	26,285	68	0.700	61.48
1999	395	25,081	2,705	28,181	2,340	370	25,471	65	0.700	63-68
Pork										
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	19,011	695	20,114	1,232	586	18,296	52	0.776	31.67
1999	586	18,905	700	20,191	1,355	475	18,361	52	0.776	33-35
Veal⁶										
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	262	0	270	0	5	265	1	0.83	82
1999	5	253	0	258	0	6	252	1	0.83	87
Lamb and mutton										
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	260	83	352	5	14	333	1	0.89	88
1998	14	250	107	371	5	12	354	1	0.89	74
1999	12	226	113	351	5	11	335	1	0.89	77
Total red meat										
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	45,285	3,413	49,593	3,395	998	45,200	123	--	--
1999	998	44,465	3,518	48,981	3,700	862	44,419	119	--	--
Broilers										
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	27,041	5	27,687	4,664	607	22,416	73	0.869	59
1998	607	27,584	5	28,196	4,516	712	22,968	73	0.869	63.10
1999	712	29,116	4	29,832	4,425	750	24,657	78	0.869	57.61
Mature chickens										
1995	14	496	3	513	99	7	406	2	1.0	--
1996	7	491	0	498	265	6	228	1	1.0	--
1997	6	510	0	516	384	7	125	1	1.0	--
1998	7	524	0	531	430	6	95	1	1.0	--
1999	6	546	0	552	412	5	135	1	1.0	--
Turkeys										
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	4,727	18	1.0	65
1998	415	5,215	1	5,631	438	309	4,883	18	1.0	62.20
1999	309	5,186	1	5,496	430	250	4,815	18	1.0	61-65
Total poultry										
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	32,964	6	33,944	5,646	1,029	27,268	91	--	--
1998	1,029	33,323	6	34,358	5,384	1,027	27,946	92	--	--
1999	1,027	34,848	5	35,880	5,267	1,005	29,607	97	--	--
Red meat and poultry										
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	76,322	3,065	81,120	8,831	1,924	70,364	209	--	--
1998	1,924	78,608	3,419	83,951	8,779	2,025	73,147	215	--	--
1999	2,025	79,313	3,523	84,861	8,967	1,867	74,026	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. 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		Primary market price*
								Total	Per capita	
Million doz.								No.	c/doz.	
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	235.6	72.9
1996	11.2	6,350.7	5.4	6,367.3	253.1	863.8	8.5	5,241.8	236.8	88.2
1997	8.5	6,473.1	6.9	6,488.5	227.8	894.8	7.4	5,358.6	240.0	81.2
1998	7.4	6,657.0	5.6	6,670.0	221.5	921.6	8.4	5,518.5	245.1	75.8
1999	8.4	6,820.0	4.0	6,832.4	231.0	970.0	5.0	5,626.4	247.5	72.8

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 & Use¹

Table 12. U.S. milk supply and use												
	Production	Commercial			Imports	Total commer- cial supply	CCC net re- movals	Commercial			CCC net removals	
		Farm use	Farm Market- ings	Beg. stocks				Ending stocks	Disap- pear- ance	All milk price ¹	Skim solids basis	Total solid basis ²

Values for latest year are forecasts. Values for the preceding year are 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			1997	1998						
	1995	1996	1997	Dec	Jul	Aug	Sep	Oct	Nov	Dec	
Broilers											
Federally inspected slaughter certified (mil. lb.)	25,020.8	26,336.3	27,270.7	2,305.6	2,353.8	2,266.5	2,321.2	2,494.2	2,191.7	2,359.8	
Wholesale price, 12-city (cents/lb.)	56.2	61.2	58.8	52.2	68.5	72.1	70.5	68..0	64.1	60.4	
Price of grower feed (\$/ton) ¹	135.1	175.5	157.8	146.0	131.0	116.0	112.0	113.0	115.0	116.0	
Broiler-feed price ratio ²	5.1	4.4	4.7	4.4	6.6	8.1	8.2	7.8	7.2	6.7	
Stocks beginning of period (mil. lb.)	458.4	560.1	641.3	604.0	583.5	553.2	541.2	581.0	594.6	657.8	
Broiler-type chicks hatched (mil.)	7,932.4	8,076.9	8,306.5	712.0	723.4	713.2	692.9	692.9	673.9	733.8	
Turkeys											
Federally inspected slaughter certified (mil. lb.)	5,128.8	5,465.6	5,477.9	460.4	459.3	413.4	429.4	474.3	461.6	430.5	
Wholesale price, Eastern U.S. 8-16 lb. young hens (cents/lb.)	66.4	66.5	64.9	62.2	61.4	63.2	65.6	71.5	73.0	69.0	
Price of turkey grower feed (\$/ton) ¹	130.1	166.1	142.5	133.0	115.0	102.0	99.0	103.0	106.0	107.0	
Turkey-feed price ratio ²	6.3	5.3	5.6	5.8	6.5	7.6	8.1	8.3	8.3	7.7	
Stocks beginning of period (mil. lb.)	254.4	271.3	328.0	438.6	656.5	703.0	708.8	702.6	669.1	314.9	
Poultz placed in U.S. (mil.)	321.7	327.2	321.5	25.7	26.2	24.5	21.1	22.8	22.2	25.0	
Eggs											
Farm production (mil.)	74,769	76,532	77,677	6,841	6,720	6,694	6,480	6,791	6,723	7,008	
Average number of layers (mil.)	294	299	304	312	309	309	311	315	319	320	
Rate of lay (eggs per layer on farms)	254.0	256.2	255.3	21.9	21.7	21.6	20.8	21.6	21.1	21.9	
Cartoned price, New York, grade A large (cents/doz.) ³	72.9	88.2	81.2	90.3	73.3	77.7	77.0	78.9	83.6	82.7	
Price of laying feed (\$/ton) ¹	149.7	184.4	159.8	143.0	148.0	121.0	119.0	118.0	116.0	118.0	
Egg-feed price ratio ²	8.6	8.5	8.8	10.1	7.9	10.7	10.7	11.3	12.5	12.8	
Stocks, first of month											
Frozen (mil. doz.)	14.8	10.5	7.7	7..8	7.7	8.9	6.8	6.3	6.9	7.1	
Replacement chicks hatched (mil.)	397.0	407.0	422.0	35.9	36.6	33.5	38.6	30.6	30.8	35.4	

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. Price of cartoned eggs to volume buyers for delivery to retailers. Information contact: LaVerne Williams (202) 694-5190

Table 14—Dairy

	Annual			1997			1998			
	1995	1996	1997	Dec	Jul	Aug	Sep	Oct	Nov	Dec
Milk--Basic Formula Price (\$/cwt) ¹	11.83	13.39	12.05	13.29	14.77	14.99	15.10	16.04	16.84	17.34
Wholesale prices										
Butter, Central States (cents/lb.) ²	81.9	108.2	116.2	133.4	203.1	216.6	273.1	242.3	187.9	140.8
Am. cheese, Wis. assembly pt. (cents/lb.)	132.8	149.1	132.4	146.1	162.6	166.9	171.0	183.5	188.7	192.4
Nonfat dry milk (cents/lb.) ³	108.6	122.2	110.0	107.4	103.0	104.6	110.1	111.8	112.5	114.9
USDA net removals										
Total (mil. lb.) ⁴	2,105.7	86.9	1,090.3	146.5	15.7	14.1	15.2	13.7	14.1	20.6
Butter (mil. lb.)	78.5	0.1	38.4	5.4	0.0	0.0	0.0	0.0	0.0	0.0
Am. cheese (mil. lb.)	6.1	4.6	11.3	0.5	0.7	0.8	0.7	0.6	0.7	0.8
Nonfat dry milk (Mil. lb.)	343.8	57.2	298.0	31.5	40.2	29.4	19.5	15.8	9.7	24.3
Milk										
Milk prod. 20 states (mil. lb.)	131,658	131,084	133,314	11,073	11,314	11,124	10,672	11,125	10,829	11,481
Milk per cow (lb.)	16,718	16,726	17,180	1,432	1,468	1,443	1,386	1,446	1,407	1,489
Number of milk cows (1,000)	7,875	7,837	7,760	7,733	7,709	7,708	7,701	7,695	7,697	7,708
U.S. milk production (mil. lb.) ⁵	155,292	154,006	156,091	12,938	13,167	12,941	12,411	12,961	12,611	13,365
Stocks, beginning ⁴										
Total (mil. lb.)	5,760	4,168	4,714	4,716	6,664	6,591	6,213	5,833	5,467	5,153
Commercial (mil. lb.)	4,263	4,099	4,704	4,697	6,637	6,554	6,173	5,793	5,433	5,125
Government (mil. lb.)	1,497	69	10	19	27	38	40	40	34	28
Imports, total (mil. lb.) ⁴	2,936	2,911	2,698	342	533	559	422	548	375	--
Commercial disappearance (mil. lb.) ⁴	154,843	154,985	156,597	12,820	13,652	13,753	13,087	13,740	13,168	--
Butter										
Production (mil. lb.)	1,264.5	1,174.5	1,151.2	106.0	67.1	61.5	67.2	83.2	87.2	101.7
Stocks, beginning (mil. lb.)	12.2	15.8	13.4	15.0	60.2	50.7	40.9	33.9	31.2	28.7
Commercial disappearance (mil. lb.)	1,186.3	1,179.8	1,108.7	95.4	86.8	84.6	80.6	95.8	87.2	--
American cheese										
Production (mil. lb.)	3,131.4	3,280.8	3,285.2	278.6	277.3	261.1	245.4	254.6	269.7	297.6
Stocks, beginning (mil. lb.)	306.6	379.6	410.3	405.3	449.6	459.8	441.4	417.3	394.5	388.5
Commercial disappearance (mil. lb.)	3,148.5	3,230.1	3,268.6	276.0	269.0	279.9	271.0	277.1	276.0	--
Other cheese										
Production (mil. lb.)	3,785.5	3,936.7	4,043.8	349.3	335.3	334.9	334.5	366.6	365.1	370.0
Stocks, beginning (mil. lb.)	126.8	105.3	107.3	68.9	133.6	134.4	135.2	135.5	128.0	105.9
Commercial disappearance (mil. lb.)	4,125.6	4,243.0	4,365.5	384.9	363.0	361.0	362.2	410.8	418.5	--
Nonfat dry milk										
Production (mil. lb.)	1,233.0	1,061.8	1,271.6	102.0	90.2	72.5	59.9	70.0	70.0	104.7
Stocks, beginning (mil. lb.)	103.5	706.0	71.1	100.6	129.3	112.3	78.1	64.4	45.9	41.6
Commercial disappearance (mil. lb.)	923.7	1,009.0	894.1	70.4	68.2	77.8	54.7	73.4	65.2	--
Frozen dessert										
Production (mil. gal.) ⁶	1,229.6	1,240.9	1,281.4	80.6	135.0	122.0	112.2	94.1	76.3	82.1
	Annual			1997			1998			
	1996	1997	1998	II	III	IV	I	II	III	IV
Milk production (mil. lb.)	154,006	156,091	157,441	40,574	38,627	38,031	39,164	40,821	38,519	38,937
Milk per cow (lb.)	16,433	16,871	17,192	4,384	4,195	4,144	4,268	4,451	4,210	4,261
No. of milk cows (1,000)	9,372	9,252	9,158	9,273	9,236	9,200	9,176	9,171	9,149	9,137
Milk-feed price ratio	1.60	1.54	1.97	1.45	1.47	1.71	1.73	1.71	2.05	2.46
Returns over concentrate costs (\$/cwt milk)	10.98	9.80	12.15	9.05	9.05	11.00	11.10	10.40	12.25	14.80

-- = Not available. Quarterly values for latest year are preliminary. 1. Manufacturing grade milk. 2. Grade AA Chicago before June 1998. 3. Prices paid f.o.b. Central States production area. 4. Milk equivalent, fat basis. 5. Monthly data ERS estimates. 6. Hard ice cream, ice milk, and hard sherbet. *Information contact: LaVerne Williams (202) 694-5190*

Table 15—Wool

	Annual			1997			1998			
	1996	1997	1998	II	III	IV	I	II	III	IV
U.S. wool price (¢/lb.) ¹	193	238	162	244	255	258	228	255	255	258
Imported wool price (¢/lb.) ²	196	206	164	210	213	204	192	176	141	141
U.S. mill consumption, scoured										
Apparel wool (1,000 lb.)	129,525	130,386	--	33,830	30,638	32,794	29,208	29,579	21,861	--
Carpet wool (1,000 lb.)	12,311	13,576	--	3,324	3,395	3,420	3,549	3,729	3,697	--

-- = Not available. 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 contact: Mae Dean Johnson (202) 694-5299

Table 16—Meat Animals

	Annual			1998						1999
	1996	1997	1998	Jan	Aug	Sep	Oct	Nov	Dec	Jan
Cattle on feed (7 states, 1000+ head capacity)										
Number on feed (1,000 head) ¹	8,667	8,943	9,455	9,455	7,706	7,750	8,376	9,190	9,404	9,021
Placed on feed (1,000 head)	19,564	20,765	19,697	1,492	1,773	2,254	2,396	1,732	1,250	1,671
Marketings (1,000 head)	18,636	19,552	19,126	1,689	1,687	1,577	1,537	1,455	1,564	1,738
Other disappearance (1,000 head)	652	701	691	78	42	51	45	63	69	47
Market prices (\$/cwt)										
Slaughter cattle										
Choice steers, 1,100-1,300 lb.										
Texas	65.06	65.99	61.75	64.57	58.75	57.93	61.54	62.23	59.97	61.46
Neb. direct	65.05	66.32	61.48	63.57	58.65	58.28	62.00	61.37	59.36	60.65
Boning utility cows, Sioux Falls	30.33	34.27	36.20	38.14	36.06	33.47	31.60	30.82	34.03	35.00
Feeder steers										
Medium no. 1, Oklahoma City										
600-650 lb.	61.31	81.34	77.70	81.54	72.24	70.37	71.67	71.99	73.33	75.60
750-800 lb.	61.08	76.19	71.78	77.23	66.93	67.61	71.26	71.26	71.26	71.26
Slaughter hogs, Iowa, S. Minn.										
Barrows and gilts, 230-250 lb.	53.39	51.36	31.67	35.35	35.11	29.37	26.98	17.55	13.92	26.36
Sows, nos. 1-2, 300-400 lb.	--	40.24	20.29	23.20	20.26	15.96	16.84	11.13	7.80	14.55
Slaughter sheep and lambs										
Lambs, Choice, San Angelo	85.27	87.95	74.20	74.38	82.05	69.50	67.20	63.33	71.44	69.31
Ewes, Good, San Angelo	39.05	49.33	40.90	49.75	35.55	36.00	33.75	36.04	45.00	41.00
Feeder lambs										
Choice, San Angelo	94.88	104.43	79.59	95.31	78.80	74.75	70.10	74.17	70.13	78.75
Wholesale meat prices, Midwest										
Boxed beef cut-out value										
Choice, 700-800 lb.	102.01	102.75	98.60	99.53	102.16	96.66	101.09	101.44	96.91	99.53
Select, 700-800 lb.	95.34	96.15	92.19	96.76	90.65	87.41	90.59	92.14	90.53	94.72
Canner and cutter cow beef	58.18	64.50	61.49	63.98	62.13	56.50	55.22	55.58	56.25	60.44
Pork cutout	--	--	53.07	54.66	57.25	50.72	48.18	42.09	48.18	42.09
Pork loins, bone-in, 1/4 " trim, 14-19 lb.	138.73	128.75	102.04	104.08	105.90	97.23	99.63	79.90	72.49	105.82
Pork bellies, 12-14 lb.	69.96	73.91	52.38	48.39	72.99	57.49	42.05	39.13	36.31	48.80
Hams, bone-in, trimmed, 23-27 lb.	--	--	--	--	45.27	43.81	38.02	34.00	33.46	32.65
All fresh beef retail price	252.44	253.77	253.28	253.24	255.11	250.04	251.92	252.89	253.75	253.45
Commercial slaughter (1,000 head) ²										
Cattle	36,583	36,318	35,471	3,040	3,040	2,992	3,053	2,775	2,894	2,962
Steers	17,819	17,529	17,430	1,450	1,554	1,451	1,515	1,421	1,406	1,428
Heifers	10,756	11,528	11,450	974	950	987	1,069	888	1,070	991
Cows	7,274	6,564	5,985	578	483	500	528	539	525	497
Bull and stags	728	696	606	48	53	54	53	48	52	46
Calves	1,768	1,575	1,456	128	125	135	125	112	130	105
Sheep and lambs	4,184	3,911	3,911	310	275	306	323	298	355	268
Hogs	92,394	91,960	101,208	8,588	8,168	8,601	9,349	9,069	9,426	8,549
Barrows and gilts	88,224	88,409	97,026	8,272	7,822	8,255	9,000	8,809	8,994	8,226
Commercial production (mil. lb.)										
Beef	25,421	25,384	25,656	2,157	2,228	2,197	2,235	2,004	2,101	2,170
Veal	368	324	250	24	20	20	21	19	22	17
Lamb and mutton	265	257	247	21	17	19	20	19	23	18
Pork	17,084	17,244	18,981	1,634	1,505	1,591	1,757	1,683	1,799	1,627
	Annual			1997		1998				1999
	1996	1997	1998	III	IV	I	II	III	IV	I
Hogs and pigs (U.S.) ³										
Inventory (1,000 head) ¹	58,201	56,124	61,158	57,366	60,459	61,158	60,163	62,213	63,488	62,156
Breeding (1,000 head) ¹	6,770	6,578	6,957	6,789	6,858	6,957	6,942	6,958	6,875	6,672
Market (1,000 head) ¹	51,431	49,546	54,200	50,577	53,598	54,200	53,220	55,254	56,612	55,483
Farrowings (1,000 head)	11,097	11,479	12,038	2,946	2,939	2,929	3,086	3,054	2,990	2,893
Pig crop (1,000 head)	94,458	99,584	104,980	25,696	25,494	25,480	26,989	25,480	25,878	--
Cattle on Feed, 7 states (1,000+ head) ⁴										
Steers and Steer Calves	5,588	5,410	5,803	4,615	5,147	5,803	5,245	4,608	5,086	5,432
Heifers and Heifer Calves	3,005	3,455	3,615	3,026	3,383	3,615	3,325	3,191	3,268	3,552
Cows and Bulls	74	78	37	38	28	37	37	26	22	37

-- = Not available. 1. Beginning of period. 2. Classes estimated. 3. Quarters are Dec. of preceding year to Feb. (I), 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) 694-5187

Crops & Products

Table 17—Supply & Utilization^{1,2}

	Area					Total	Feed	Other		Total	Ending	Farm
	Set-	Planted	Harvested	Yield	Production	supply ⁴	& residual	domestic use	Exports	use	stocks	price ⁵
	aside ³											
	<i>Mil. Acres</i>			<i>Bu./acre</i>								<i>\$/bu.</i>
Wheat												
1994/95	5.2	70.3	61.8	37.6	2,321	2,981	345	942	1,188	2,475	507	3.45
1995/96	6.1	69.0	61.0	35.8	2,183	2,757	154	986	1,241	2,381	376	4.55
1996/97	--	75.1	62.8	36.3	2,277	2,746	308	993	1,001	2,302	444	4.30
1997/98*	--	70.4	62.8	39.5	2,481	3,020	248	1,009	1,040	2,297	722	3.38
1998/99*	--	65.9	59.0	43.2	2,550	3,368	350	1,013	1,025	2,388	980	2.65-2.75
	<i>Mil. acres</i>			<i>lb./acre</i>			<i>Mil. cwt (rough equiv)</i>					<i>\$/cwt</i>
Rice ⁶												
1994/95	0.3	3.4	3.3	5,964.0	197.8	230.9	--	6/ 100.7	98.9	199.6	31.3	6.78
1995/96	0.5	3.1	3.1	5,621.0	173.9	212.6	--	6/ 104.6	83.0	187.6	25.0	9.15
1996/97	--	2.8	2.8	6,120.0	171.6	206.6	--	6/ 101.0	78.4	179.4	27.2	9.96
1997/98*	--	3.1	3.1	5,897.0	183.0	219.4	--	6/ 106.5	85.2	191.7	27.7	9.70
1998/99*	--	3.3	3.3	5,669.0	188.1	224.7	--	6/ 108.7	86.0	194.7	30.0	8.25-8.75
	<i>Mil. acres</i>			<i>Bu./acre</i>			<i>Mil. bu.</i>					<i>\$/bu.</i>
Corn												
1994/95	2.4	78.9	72.5	138.6	10,051	10,910	5,470	1,704	2,177	9,352	1,558	2.26
1995/96	7.7	71.5	65.2	113.5	7,400	8,974	4,708	1,612	2,228	8,548	426	3.24
1996/97	--	79.2	72.6	127.1	9,233	9,672	5,302	1,692	1,795	8,789	883	2.71
1997/98*	--	79.5	72.7	126.7	9,207	10,099	5,505	1,782	1,504	8,791	1,308	2.43
1998/99*	--	80.2	72.6	134.4	9,761	11,081	5,700	1,870	1,725	9,295	1,786	1.80-2.10
	<i>Mil. acres</i>			<i>Bu./acre</i>			<i>Mil. bu.</i>					<i>\$/bu.</i>
Sorghum												
1994/95	1.6	9.8	8.9	72.7	646	693	377	22	223	622	72	2.13
1995/96	1.7	9.4	8.3	55.6	459	530	295	19	198	512	18	3.19
1996/97	--	13.1	11.8	67.3	795	814	516	45	205	766	47	2.34
1997/98*	--	10.1	9.2	69.2	634	681	365	55	212	632	49	2.21
1998/99*	--	9.6	7.7	67.3	520	569	275	45	185	505	64	1.55-1.85
	<i>Mil. acres</i>			<i>Bu./acre</i>			<i>Mil. bu.</i>					<i>\$/bu.</i>
Barley												
1994/95	2.7	7.2	6.7	56.2	375	580	228	173	66	467	113	2.03
1995/96	2.9	6.7	6.3	57.2	359	513	179	172	62	413	100	2.89
1996/97	--	7.1	6.7	58.5	392	529	217	172	31	419	109	2.74
1997/98*	--	6.7	6.2	58.1	360	510	144	172	74	390	119	2.38
1998/99*	--	6.3	5.9	60.1	352	502	185	172	30	387	115	1.90-2.00
	<i>Mil. acres</i>			<i>Bu./acre</i>			<i>Mil. bu.</i>					<i>\$/bu.</i>
Oats												
1994/95	0.6	6.6	4.0	57.1	229	428	234	92	1	327	101	1.22
1995/96	0.8	6.2	3.0	54.6	161	342	182	92	2	276	66	1.67
1996/97	--	4.6	2.7	57.7	153	317	153	95	3	250	67	1.96
1997/98*	--	5.1	2.8	59.5	167	332	161	95	2	258	74	1.60
1998/99*	--	4.9	2.8	60.4	167	346	165	95	2	262	84	1.10-1.20
	<i>Mil. acres</i>			<i>Bu./acre</i>			<i>Mil. bu.</i>					<i>\$/bu.</i>
Soybeans ⁷												
1994/95	--	61.7	60.9	41.4	2,517	2,731	153	1,405	838	2,396	335	5.48
1995/96	--	62.6	61.6	35.3	2,177	2,516	112	1,370	851	2,333	183	6.72
1996/97	--	64.2	63.3	37.6	2,380	2,573	123	1,436	882	2,441	132	7.35
1997/98*	--	70.0	69.1	38.9	2,689	2,826	158	1,597	870	2,626	200	6.47
1998/99*	--	72.4	70.8	38.9	2,757	2,963	153	1,590	810	2,553	410	5.00-5.40
	<i>Mil. lbs.</i>						<i>¢/lb.</i>					
Soybean oil												
1994/95	--	--	--	--	15,613	16,733	--	12,916	2,680	15,597	1,137	27.58
1995/96	--	--	--	--	15,240	16,472	--	13,465	992	14,457	2,015	24.75
1996/97	--	--	--	--	15,752	17,821	--	14,263	2,037	16,300	1,520	22.50
1997/98*	--	--	--	--	18,143	19,724	--	15,264	3,077	18,341	1,382	25.84
1998/99*	--	--	--	--	18,070	19,515	--	15,600	2,550	18,150	1,365	23.50-25.00
	<i>1,000 tons</i>						<i>\$/ton⁸</i>					
Soybean meal												
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	--	--	--	--	34,210	34,524	--	27,320	6,994	34,314	210	270.9
1997/98*	--	--	--	--	38,171	38,436	--	28,888	9,330	38,218	218	185.5
1998/99*	--	--	--	--	37,757	38,025	--	29,850	7,900	37,750	275	130-145

See footnotes at end of table, next page

Table 17—Supply & Utilization (continued)

	Area			Yield	Production	Total Supply ⁴	Feed & residual	Other domestic use	Exports	Total Use	Ending stocks	Farm price ⁵
	Set- aside ³	Planted	Harvested									
	<i>Mil. Acres</i>					<i>Lb./acre</i>	<i>Mil. Bales</i>					
Cotton ⁹												
1994/95	1.7	13.7	13.3	709	19.7	23.2	--	11.2	9.4	20.6	2.7	72.0
1995/96	0.3	16.9	16.0	537	17.9	21.0	--	10.6	7.7	18.3	2.6	75.4
1996/97	--	14.7	12.9	705	18.9	22.0	--	11.1	6.9	18.0	4.0	69.3
1997/98*	--	13.9	13.4	673	18.8	22.8	--	11.3	7.5	18.8	3.9	65.2
1998/99*	--	13.4	10.7	618	13.8	18.0	--	10.4	4.2	14.6	3.4	--

-- = Not available or not applicable. *February 10, 1999 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 soybean meal and soybean oil. 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 bushels 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 protein, 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. *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			1997			1998			
	1995/96	1996/97	1997/98	Dec	Jul	Aug	Sep	Oct	Nov	Dec
Wheat, no. 1 HRW, Kansas City (\$/bu.) ²	5.49	4.88	3.71	3.72	3.02	2.74	2.81	3.30	3.42	3.31
Wheat, DNS, Minneapolis (\$/bu.) ³	5.72	4.96	4.31	4.27	3.89	3.58	3.53	4.03	4.15	3.97
Rice, S.W. La. (\$/cwt) ⁴	18.90	20.34	18.92	19.15	18.50	18.35	17.50	17.50	17.63	17.63
Corn, no. 2 yellow, 30-day, Chicago (\$/bu.) ⁵	3.97	2.84	2.56	2.70	2.27	1.97	1.84	2.00	2.16	2.16
Sorghum, no. 2 yellow, Kansas City (\$/cwt) ⁵	6.66	4.54	4.11	4.26	3.74	3.27	2.98	3.17	3.45	3.41
Barley, feed, Duluth (\$/bu.)	2.67	2.32	1.90	1.66	1.23	--	--	--	--	--
Barley, malting Minneapolis (\$/bu.)	3.69	3.18	2.50	--	--	2.30	--	--	--	--
U.S. cotton price, SLM, 1-1/16 in. (¢/lb.) ⁶	83.00	71.60	67.79	64.57	74.18	71.87	71.75	67.61	64.95	59.88
Northern Europe prices cotton index (¢/lb.) ⁷	85.60	78.66	72.11	74.68	69.36	68.13	66.16	61.12	56.53	56.02
U.S. M 1-3/32 in. (¢/lb.) ⁸	94.70	82.86	77.98	77.33	81.35	76.94	77.75	72.95	71.50	71.25
Soybeans, no. 1 yellow, 30-day Chicago (\$/bu)	6.72	7.38	6.51	6.92	6.26	5.31	5.01	5.26	5.52	5.55
Soybean oil, crude, Decatur (¢/lb.)	24.75	22.50	24.69	25.08	24.88	23.99	25.13	25.21	25.20	23.99
Soybean meal, 48% protein, Decatur (\$/ton)	236.00	270.90	276.78	222.50	183.40	146.25	135.80	135.70	144.50	146.40

-- = No quotes. 1. Beginning June 1 for wheat and barley; Aug. 1 for rice and cotton; September 1 for corn, sorghum, and soybeans; October 1 for soybean meal and oil. 2. Ordinary protein. 3. 14 percent protein. 4. Long grain, milled basis. 5. Marketing year 1997/98 data are preliminary. 6. Average spot market. 7. Liverpool Cotlook "A" Index; average of 5 lowest prices of 13 selected growths. 8. 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 payment rate	Effective base acres ²	Program ³	Flexibility contract payment rate	Acres under contract	Contract payment yields	Partici- pation rate ⁴
					<i>Mil.</i> <i>acres</i>	<i>Percent</i> <i>of base</i>	<i>\$/bu.</i>	<i>Mil. acres</i>	<i>Bu./cwt</i>	<i>Percent</i>
	<i>\$/bu.</i>									
Wheat										
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	76.7	34.70	99
1997/98	--	--	2.58	--	--	--	0.631	76.7	34.70	--
1998/99 ⁵	--	--	2.58	--	--	--	0.663	78.9	34.50	--
	<i>\$/cwt</i>						<i>\$/cwt</i>			
Rice										
1994/95	10.71	6.50	5.88 ⁶	3.79	4.20	0/0/0	--	--	--	95
1995/96	10.71	6.50	6.50 ⁶	3.22 ⁷	4.20	5/0/0	--	--	--	95
1996/97	--	6.50	--	--	--	--	2.766	4.2	48.27	99
1997/98	--	6.50	--	--	--	--	2.710	4.2	48.17	--
1998/99 ⁵	--	6.50	--	--	--	--	2.921	4.2	48.17	--
	<i>\$/bu.</i>						<i>\$/bu.</i>			
Corn										
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	80.7	102.90	98
1997/98	--	--	1.89	--	--	--	0.486	80.9	102.80	--
1998/99 ⁵	--	--	1.89	--	--	--	0.377	82.0	102.60	--
	<i>\$/bu.</i>						<i>\$/bu.</i>			
Sorghum										
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	13.1	57.30	99
1997/98	--	--	1.76	--	--	--	0.544	13.1	57.30	--
1998/99 ⁵	--	--	1.74	--	--	--	0.452	13.6	56.90	--
	<i>\$/bu.</i>						<i>\$/bu.</i>			
Barley										
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	--	--	1.57	--	--	--	0.277	10.5	47.20	--
1998/99 ⁵	--	--	1.56	--	--	--	0.284	11.2	46.70	--
	<i>\$/bu.</i>						<i>\$/bu.</i>			
Oats										
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	--	--	1.11	--	--	--	0.031	6.2	50.80	--
1998/99 ⁵	--	--	1.11	--	--	--	0.031	6.5	50.70	--
	<i>\$/bu.</i>						<i>\$/bu.</i>			
Soybeans ⁸										
1994/95	--	--	4.92	--	--	--	--	--	--	--
1995/96	--	--	4.92	--	--	--	--	--	--	--
1996/97	--	--	4.97	--	--	--	--	--	--	--
1997/98	--	--	5.26	--	--	--	--	--	--	--
1998/99	--	--	5.26	--	--	--	--	--	--	--
	<i>¢/lb.</i>						<i>¢/lb.</i>			
Upland cotton										
1994/95	72.90	50.00	50.00 ⁹	4.60	15.30	11/0/0	--	--	--	89
1995/96	72.90	51.92	51.92 ⁹	0.00 ⁷	15.50	0/0/0	--	--	--	79
1996/97	--	51.92	--	--	--	--	8.882	16.2	610.00	99
1997/98	--	51.92	--	--	--	--	7.625	16.2	608.00	--
1998/99 ⁵	--	51.92	--	--	--	--	8.173	16.4	604.00	--

-- = 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. Starting in 1996, participation rate is the percent of eligible acres that entered production flexibility contracts. 5. Estimated payment rates and acres under contract. 6. 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. 7. Guaranteed payment rates for producers in the 50/85/92 program were \$0.034/lb. for upland cotton and \$4.21/cwt. for rice. 8. There are no target prices, base acres, acreage reduction programs or deficiency payment rates for soybeans. 9. 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. Note: The 1996 Act replaced target prices and deficiency payments with fixed annual payments to producers. Information contact: Brenda Chewing, Farm Service Agency (202) 720-8838

Table 20—Fruit

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Citrus ¹										
Production (1,000 tons)	13,186	10,860	11,285	12,452	15,274	14,561	15,799	15,712	17,234	18,009
Per capita consumpt. (lb.) ²	23.6	21.4	19.1	24.4	26.0	25.0	24.1	25.0	26.8	--
Noncitrus ³										
Production (1,000 tons)	16,345	15,640	15,740	17,124	16,563	17,341	16,358	16,103	18,382	--
Per capita consumpt. (lb.) ²	72.8	70.4	70.6	73.8	73.9	75.6	73.7	74.0	76.0	--
	1998									1999
	Jan	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Grower prices										
Apples (¢/pound) ⁴	21.9	17.8	16.3	16.1	19.0	22.7	22.8	17.9	15.2	15.9
Pears (¢/pound) ⁴	12.65	18.65	17.65	20.25	22.85	21.00	23.95	19.90	17.70	18.65
Oranges (\$/box) ⁵	3.15	5.86	6.70	6.71	5.37	4.97	5.42	5.87	4.74	5.15
Grapefruit (\$/box) ⁵	1.79	0.42	3.58	3.66	6.01	11.09	3.88	3.19	2.70	1.80
Stocks, ending										
Fresh apples (mil. lb.)	3,729	1,113	637	322	133	3,455	6,796	5,913	5,009	--
Fresh pears (mil. lb.)	273	32	4	0	94	534	513	384	314	--
Frozen fruits (mil. lb.)	1,128	764	836	1,040	1,032	1,050	1,280	1,353	1,209	--
Frozen conc.orange juice (mil. single-strength gallons)	794	1,066	999	914	827	733	626	629	720	--

-- = 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) 694-5251

Table 21—Vegetables

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Production ¹										
Total vegetables (1,000 cwt)	543,435	562,938	565,754	677,975	675,793	762,934	742,595	759,347	752,266	--
Fresh (1,000 cwt) ^{2,4}	254,418	254,039	242,733	393,249	377,698	396,671	391,699	408,823	428,171	--
Processed (tons) ^{3,4}	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 lbs) ⁵	714,992	749,151	746,832	776,357	750,799	782,340	777,870	776,677	808,602	--
Potatoes (1,000 cwt)	370,444	402,110	417,622	425,367	428,693	467,054	443,606	499,254	467,091	477,754
Sweet potatoes (1,000 cwt)	11,358	12,594	11,203	12,005	11,027	13,380	12,821	13,216	13,327	11,887
Dry edible beans (1,000 cwt)	23,729	32,379	33,765	22,615	21,862	28,950	30,689	27,912	29,370	30,828
	1998									1999
	Jan	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Shipments (1,000 cwt)										
Fresh	23,713	28,082	29,181	26,104	18,422	18,851	15,727	18,842	21,813	19,681
Iceberg lettuce	4,089	3,628	3,377	4,021	3,099	3,900	3,049	3,179	3,549	3,068
Tomatoes, all	4,189	3,540	3,031	2,858	2,667	2,927	2,568	2,719	3,497	3,496
Dry-bulb onions	4,075	3,584	3,006	3,255	3,278	3,783	3,049	3,084	3,423	2,896
Others ⁶	11,360	17,330	19,767	15,970	9,378	8,241	7,061	9,860	11,344	10,221
Potatoes, all	16,328	14,554	11,965	12,734	9,569	12,695	11,498	11,734	13,483	12,819
Sweet potatoes	146	213	147	140	96	289	326	738	448	263

-- = 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, and cauliflower. 4. Data after 1991 not comparable to previous years because commodity estimates reinstated 'in 1992 are included. 5. Fresh and processing agarcus 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, and watermelons. Information contact: Gary Lucier (202) 694-5253

Table 22—Other Commodities

	Annual			1997			1998			
	1995	1996	1997	II	III	IV	I	II	III	IV
Sugar										
Production ¹	7,978	7,268	7,418	679	576	4,088	2,376	824	733	2,452
Deliveries ¹	9,451	9,633	9,756	2,430	2,642	2,469	2,261	2,465	2,616	--
Stocks, ending ¹	2,908	3,195	3,376	2,734	1,487	3,195	3,917	2,881	1,679	--
Coffee										
Composite green price ² N.Y. (¢/lb.)	142.18	109.35	146.49	172.99	143.29	134.89	143.58	117.73	98.57	97.83
	1998									1999
	1995	1996	1997	Jan	Aug	Sep	Oct	Nov	Dec	Jan
Tobacco										
Avg. price to grower ³										
Flue-cured (\$/lb.)	1.79	1.83	1.73	--	1.62	1.79	1.87	1.81	--	--
Burley (\$/lb.)	1.85	1.92	1.86	1.88	--	--	--	1.92	1.92	1.91
Domestic taxable removals										
Cigarettes (bil.)	486.0	471.4	310.2	35.9	41.5	--	--	--	--	--
Large cigars (mil.) ⁴	3,166.4	3,552.9	2,520.0	260.8	321.3	--	--	--	--	--

-- = 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, October-September for burley. 4. Includes imports of large cigars. Information contacts: sugar, Fanny Jolly (202) 694-5249; tobacco, Tom Capehart (202) 694-5245

World Agriculture

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

	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99 F
	Million units									
Wheat										
Area (hectares)	225.8	231.4	222.5	223.2	222.3	215.4	219.9	231.0	229.5	226.2
Production (metric tons)	533.2	588.0	542.9	562.4	559.0	524.8	538.3	582.4	609.5	586.2
Exports (metric tons) ¹	103.8	101.1	111.2	113.0	101.4	100.8	98.8	101.5	100.3	95.8
Consumption (metric tons) ²	532.7	561.9	555.5	550.3	561.9	547.6	550.3	576.5	584.7	595.8
Ending stocks (metric tons) ³	118.9	145.1	132.5	144.5	141.5	118.7	106.7	112.7	137.5	127.9
Coarse grains										
Area (hectares)	321.9	316.3	321.9	323.8	317.2	322.9	313.8	322.4	310.9	308.7
Production (metric tons)	793.7	828.7	810.5	872.0	799.7	871.9	802.9	906.5	881.1	880.8
Exports (metric tons) ¹	104.7	89.1	95.6	91.9	85.3	98.5	88.3	93.4	86.6	89.0
Consumption (metric tons) ²	817.7	817.1	809.7	844.0	839.3	858.6	841.2	877.7	873.3	874.9
Ending stocks (metric tons) ³	123.2	134.8	135.6	163.4	123.8	137.1	98.7	127.5	135.3	141.3
Rice, milled										
Area (hectares)	146.5	146.6	147.3	146.4	145.0	147.3	148.0	149.7	149.7	149.4
Production (metric tons)	343.9	352.0	354.7	355.6	355.4	364.5	371.3	380.3	384.3	377.7
Exports (metric tons) ¹	11.7	12.1	14.1	14.9	16.4	21.0	19.6	19.0	27.3	21.0
Consumption (metric tons) ²	338.2	347.4	356.4	357.8	358.5	366.6	371.6	379.5	383.9	385.0
Ending stocks (metric tons) ³	54.5	59.1	57.5	55.3	52.2	50.1	49.8	50.7	51.2	43.8
Total grains										
Area (hectares)	694.2	694.3	691.7	693.4	684.5	685.6	681.7	703.0	690.0	684.3
Production (metric tons)	1,670.8	1,768.7	1,708.1	1,790.0	1,714.1	1,761.2	1,712.5	1,869.2	1,875.0	1844.7
Exports (metric tons) ¹	220.2	202.3	220.9	219.8	203.1	220.3	206.7	214.0	214.2	205.8
Consumption (metric tons) ²	1,688.6	1,726.4	1,721.6	1,752.1	1,759.7	1,772.8	1,763.1	1,833.7	1,841.9	1855.7
Ending stocks (metric tons) ³	296.6	339.0	325.6	363.2	317.5	305.9	255.2	290.9	324.0	313.0
Oilseeds										
Crush (metric tons)	171.7	176.7	185.1	184.4	190.1	208.1	217.5	218.8	228.9	235.5
Production (metric tons)	212.4	215.7	224.3	227.5	229.4	261.8	258.5	261.2	285.6	288.0
Exports (metric tons)	35.6	33.4	37.6	38.2	38.7	44.1	44.4	49.4	53.7	53.4
Ending stocks (metric tons)	23.7	23.4	21.9	23.6	20.3	27.2	22.1	16.4	22.2	25.3
Meals										
Production (metric tons)	116.8	119.3	125.2	125.2	131.7	142.1	147.4	149.1	155.8	161.1
Exports (metric tons)	39.8	40.7	42.2	40.8	44.9	46.7	49.7	50.3	51.5	54.8
Oils										
Production (metric tons)	57.1	58.1	60.6	61.1	63.7	69.6	73.2	75.6	76.3	79.9
Exports (metric tons)	20.4	20.5	21.3	21.3	24.3	27.1	26.0	28.9	29.4	30.1
Cotton										
Area (hectares)	31.6	33.2	34.8	32.6	30.6	32.2	35.9	33.8	33.5	32.7
Production (bales)	79.7	87.1	95.7	82.5	76.7	85.6	93.0	89.6	91.4	84.2
Exports (bales)	31.3	29.6	28.5	25.5	26.8	28.4	27.8	26.8	26.5	24.6
Consumption (bales)	86.9	85.5	85.9	85.8	85.3	85.5	86.9	88.3	88.1	85.8
Ending stocks (bales)	25.3	27.8	37.6	35.1	27.0	29.0	34.6	37.8	41.1	39.3
	1989	1990	1991	1992	1993	1994	1995	1996 F	1997 F	1998 F
Red meat ⁴										
Production (metric tons)	112.3	117.7	117.3	119.3	124.6	130.2	135.5	137.4	133.2	--
Consumption (metric tons)	110.9	116.1	115.7	118.3	123.5	128.7	132.8	135.1	130.1	--
Exports (metric tons) ¹	8.2	7.5	7.4	7.4	8.1	8.2	8.5	8.6	7.6	--
Poultry ⁴										
Production (metric tons)	33.1	39.6	38.0	40.5	43.9	47.7	50.5	52.7	53.7	55.6
Consumption (metric tons)	32.6	38.4	37.0	39.4	42.5	46.2	48.8	50.8	51.8	53.7
Exports (metric tons) ¹	1.7	2.8	2.4	2.8	3.7	4.6	5.3	5.7	5.5	5.5
Dairy										
Milk production (metric tons) ⁵	387.4	377.6	378.4	377.6	378.4	380.8	379.8	381.2	384.3	--

F = forecast. 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			1998						1999
	1996	1997	1998	Jan	Aug	Sep	Oct	Nov	Dec	Jan
Export commodities										
Wheat, f.o.b. vessel, Gulf ports (\$/bu.)	5.63	4.35	3.44	3.78	2.96	2.94	3.43	3.57	3.44	3.41
Corn, f.o.b. vessel, Gulf ports (\$/bu.)	4.17	2.98	2.59	2.91	2.25	2.19	2.43	2.47	2.43	2.48
Grain sorghum, f.o.b. vessel, Gulf ports (\$/bu.)	3.90	2.89	2.54	2.88	2.34	2.16	2.29	2.37	2.33	2.32
Soybeans, f.o.b. vessel, Gulf ports (\$/bu.)	7.88	7.94	6.37	7.00	5.83	5.62	5.73	6.01	5.88	5.65
Soybean oil, Decatur (¢/lb.)	23.75	23.33	25.78	25.09	24.00	25.14	25.21	25.21	23.99	22.88
Soybean meal, Decatur, (\$/ton)	246.67	266.70	162.74	202.84	146.15	135.83	135.70	144.45	146.45	138.82
Cotton, 7-market avg. spot (¢/lb.)	77.93	69.62	67.04	62.86	71.87	71.77	67.61	64.98	59.88	56.20
Tobacco, avg. price at auction (¢/lb.)	183.20	182.74	179.77	192.05	159.51	179.06	186.53	181.01	191.02	189.98
Rice, f.o.b., mill, Houston (\$/cwt)	19.64	20.88	18.95	19.75	18.85	18.75	18.25	18.50	18.50	18.44
Inedible tallow, Chicago (¢/lb.)	20.13	20.75	17.67	18.20	17.57	16.22	16.98	16.90	16.70	16.30
Import commodities										
Coffee, N.Y. spot (\$/lb.)	1.29	2.05	1.39	1.76	1.28	1.13	1.11	1.23	1.17	1.11
Rubber, N.Y. spot (¢/lb.)	72.88	55.40	40.57	40.21	38.58	38.66	40.26	39.99	38.24	38.99
Cocoa beans, N.Y. (\$/lb.)	0.62	0.69	0.72	0.73	0.72	0.72	0.71	0.67	0.64	0.61

Information contact: Jenny Gonzales (202) 694-5296, Mae Dean Johnson (202) 694-5299, Mary Teymourian (202) 694-5173 for coffee, rubber, cocoa beans, and tobacco.

Table 25—Trade Balance

	Fiscal Year			1997		1998				
	1997	1998	1999 P	Dec	Jul	Aug	Sep	Oct	Nov	Dec
\$ million										
Exports										
Agricultural	57,365	53,730	49,000	5,243	3,884	3,704	3,467	4,859	4,671	4,827
Nonagricultural	569,892	584,077	--	50,779	44,054	45,692	48,056	51,298	49,144	50,071
Total ¹	627,257	637,807	--	56,022	47,938	49,396	51,523	56,157	53,815	54,898
Imports										
Agricultural	35,798	37,014	38,000	3,263	2,908	2,857	2,919	3,120	2,912	3,191
Nonagricultural	829,548	859,730	--	71,031	72,818	72,688	74,754	80,463	74,535	72,816
Total ²	865,346	896,744	--	74,294	75,726	75,545	77,673	83,583	77,447	76,007
Trade Balance										
Agricultural	21,567	16,716	11,000	1,980	976	847	548	1,739	1,759	1,636
Nonagricultural	-259,656	-275,653	--	-20,252	-28,764	-26,149	-26,696	-29,165	-25,391	-22,745
Total	-238,089	-258,937	--	-18,272	-27,788	-26,149	-26,150	-27,426	-23,632	-21,109

P = Projected. -- = Not available. Fiscal year (Oct. 1-Sep. 30). 1. Domestic exports including Department of Defense shipments (F.A.S. value).

2. Imports for consumption (customs value). Information contact: Mary Fant (202) 694-5272

Table 26—Indexes of Real Trade-Weighted Dollar Exchange Rates¹

	Annual			1997		1998				
	1996	1997	1998	Dec	Jul P	Aug P	Sep P	Oct P	Nov P	Dec P
<i>1990=100</i>										
Total U.S. trade	100.8	111.9	115.1	114.5	118.1	118.9	113.4	109.3	111.4	110.3
Agricultural trade										
U.S. markets	101.0	109.6	115.5	114.0	117.5	119.8	118.5	113.8	113.2	111.6
U.S. competitors	98.7	109.1	113.9	113.1	116.3	116.3	112.1	108.9	110.2	109.6
High-value products										
U.S. markets	100.4	108.2	111.9	110.0	114.5	117.3	114.9	110.7	110.2	108.7
U.S. competitors	100.1	110.9	114.6	114.2	116.6	116.9	112.5	109.1	110.9	110.2
Corn										
U.S. markets	96.4	107.1	113.3	112.1	117.7	120.2	116.4	109.0	107.8	105.8
U.S. competitors	90.1	97.4	100.2	99.6	102.1	102.0	99.1	97.0	97.9	97.4
Soybeans										
U.S. markets	96.0	107.9	113.9	112.8	117.1	118.2	114.6	108.6	108.6	106.8
U.S. competitors	80.8	82.2	84.9	83.5	85.2	85.4	85.2	85.4	85.3	85.3
Wheat										
U.S. markets	100.7	105.4	112.2	111.1	112.8	114.2	114.9	112.0	110.9	109.9
U.S. competitors	102.1	109.8	116.0	113.8	117.5	119.4	116.6	114.6	115.3	115.3
Vegetables										
U.S. markets	105.6	112.4	117.8	114.9	119.7	122.9	121.2	118.5	117.7	116.7
U.S. competitors	100.5	112.0	114.1	114.5	116.0	116.0	111.7	108.3	110.0	108.9
Red meats										
U.S. markets	93.3	100.4	109.0	107.4	113.7	116.9	112.8	105.3	104.3	101.7
U.S. competitors	98.0	107.9	112.8	111.7	114.9	115.6	111.7	108.4	109.9	109.6
Fruits & fruit juices										
U.S. markets	101.3	111.3	114.1	111.7	117.0	119.8	116.7	112.8	112.6	111.5
U.S. competitors	98.2	107.2	111.7	111.0	113.9	114.2	110.7	107.6	108.4	108.1
Cotton										
U.S. markets	95.5	105.7	123.8	121.3	127.9	126.8	124.0	116.7	114.5	112.0
U.S. competitors	101.6	103.0	106.8	106.2	107.8	108.3	108.1	105.8	105.1	104.9
Poultry										
U.S. markets	102.8	111.9	109.2	104.4	106.4	109.1	118.1	116.8	115.5	116.9
U.S. competitors	95.7	107.3	109.9	111.3	111.4	111.5	107.6	104.6	105.9	105.3

P = preliminary. 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. The "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 one year due to delayed reporting by some countries. High-value products conform to FAS's definition for consumer-oriented agricultural products.

Data are available at <http://mann77.mannlib.cornell.edu/data-sets/international/88021/>.

Information contact: Tim Baxter (202) 694-5318 or Andy Jerardo (202) 694-5323

Note: The indices have recently been revised to reflect a rebasing of the Russian ruble and to correct errors in the CPI data for Hong Kong and Taiwan. The complete corrected series is on line at the Mann library URL.

Table 27—U.S. Agricultural Exports & Imports

	Fiscal Year			Dec		Fiscal Year			Dec	
	1997	1998	1999 P	1997	1998	1997	1998	1999 P	1997	1998
	1,000 units					\$ million				
EXPORTS										
Animals, live (na)	--	--	--	--	--	508	538	--	87	86
Meats and preps., excl. poultry (mt) ²	1,823	2,064	1,700	175	170	4,438	4,507	4,200	384	351
Dairy products (na)	--	--	--	--	--	869	925	900	84	80
Poultry meats (mt)	2,553	2,663	2,300	222	224	2,516	2,347	1,900	197	159
Fats, oils, and greases (mt)	1,056	1,365	1,300	107	141	543	655	--	57	62
Hides and skins, incl. Furskins (na)	--	--	--	--	--	1,693	1,358	1,400	101	76
Cattle hides, whole (no.) ¹	20,761	18,992	--	1,232	1,276	1,232	969	--	72	60
Mink pelts (no.) ¹	3,600	2,990	--	220	117	96	83	--	4	3
Grains and feeds (mt) ³	95,091	87,289	--	7,978	9,443	16,368	13,961	13,800	1,295	1,323
Wheat (mt) ⁴	24,526	25,791	28,500	2,194	2,626	4,117	3,759	3,900	338	349
Wheat flour (mt)	511	465	600	62	128	141	117	--	17	24
Rice (mt)	2,560	3,310	3,200	243	255	959	1,132	1,100	90	86
Feed grains, incl. products (mt) ⁵	53,796	44,564	49,400	4,273	5,298	7,166	5,187	4,800	532	553
Feeds and fodders (mt)	12,295	11,704	11,900	1,116	1,008	2,688	2,421	2,300	216	197
Other grain products (mt)	1,404	1,455	--	90	128	1,295	1,345	--	102	114
Fruits, nuts, and preps. (mt)	3,830	3,633	--	306	293	4,261	3,977	4,200	334	318
Fruit juices, incl.										
froz. (1,000 hectoliters) ¹	10,455	10,658	--	781	810	658	653	--	52	52
Vegetables and preps. (na)	--	--	--	--	--	4,081	4,168	2,800	356	377
Tobacco, unmanufactured (mt)	238	208	--	20	25	1,612	1,448	1,400	133	156
Cotton, excl. linters (mt) ⁶	1,566	1,552	900	169	224	2,711	2,517	1,400	285	329
Seeds (mt)	1,200	816	--	85	61	913	827	900	101	107
Sugar, cane or beat (mt)	139	123	--	8	14	60	48	--	4	5
Oilseeds and products (mt)	33,808	35,966	33,800	4,693	3,654	11,288	10,984	8,600	1,421	987
Oilseeds (mt)	24,735	24,251	--	3,344	2,609	7,875	6,818	--	944	612
Soybeans (mt)	24,027	23,287	22,300	3,279	2,501	6,950	6,117	4,700	891	552
Protein meal (mt)	6,671	8,666	--	1,083	689	1,795	1,975	--	291	121
Vegetable oils (mt)	2,402	3,049	--	266	356	1,618	2,191	--	186	254
Essential oils (mt)	46	46	--	3	3	619	533	--	36	36
Other	--	--	--	--	--	4,228	4,284	--	337	323
Total	--	--	--	--	--	57,365	53,730	49,000	5,243	4,827
IMPORTS										
Animals, live (na)	--	--	--	--	--	1,525	1,670	1,400	135	106
Meats and preps., excl. poultry (mt)	1,140	1,230	1,200	94	115	2,583	2,718	2,800	221	247
Beef and veal (mt)	785	857	--	62	74	1,552	1,761	--	134	158
Pork (mt)	260	271	--	24	29	766	686	--	64	58
Dairy products (na)	--	--	--	--	--	1,273	1,368	1,400	126	164
Poultry and products (na)	--	--	--	--	--	186	207	--	19	18
Fats, oils, and greases (mt)	76	80	--	7	3	58	59	--	6	3
Hides and skins, incl. furskins (mt)	--	--	--	--	--	210	184	--	22	15
Wool, unmanufactured (mt)	38	45	--	5	3	131	151	--	19	7
Grains and feeds (na)	--	--	--	--	--	2,941	2,919	3,000	266	246
Fruits, nuts, and preps.,										
excl. juices (mt)	7,121	7,581	8,000	617	556	3,773	3,982	5,000	352	364
Bananas and plantains (mt)	3,950	4,175	4,100	334	289	1,218	1,214	1,300	96	80
Fruit juices (1,000 hectoliters) ¹	29,829	26,577	27,000	2,849	2,669	913	669	--	69	64
Vegetables and preps. (na)	--	--	--	--	--	3,604	4,249	4,500	381	426
Tobacco, unmanufactured (mt)	337	241	200	26	17	1,179	822	800	104	74
Cotton, unmanufactured (mt)	27	10	--	1	6	34	11	--	2	10
Seeds (mt)	223	257	--	13	19	357	422	--	31	30
Nursery stock and cut flowers (na)	--	--	--	--	--	974	1,082	1,100	82	81
Sugar, cane or beet (mt)	2,938	2,170	2,100	166	134	1,013	758	--	53	40
Oilseeds and products (mt)	3,780	4,314	4,300	423	368	2,248	2,243	2,300	202	185
Oilseeds (mt)	985	1,028	--	96	86	374	371	--	34	31
Protein meal (mt)	967	1,277	--	110	115	181	188	--	18	14
Vegetable oils (mt)	1,828	2,010	--	217	167	1,693	1,684	--	151	140
Beverages, excl. fruit										
juices (1,000 hectoliters) (na)	--	--	--	--	--	3,247	3,705	--	278	308
Coffee, tea, cocoa, spices (mt)	2,305	2,374	--	217	231	5,778	6,066	--	586	505
Coffee, incl. products (mt)	1,212	1,155	1,200	103	118	3,698	3,587	3,800	347	278
Cocoa beans and products (mt)	767	875	1,000	88	77	1,414	1,701	1,800	176	149
Rubber and allied gums (mt)	1,075	1,162	1,200	90	114	1,315	1,027	1,100	85	80
Other	--	--	--	--	--	2,458	2,703	--	223	228
Total	--	--	--	--	--	35,798	37,017	38,000	3,263	3,201

P=Projection. -- = Not available. Projections are fiscal years (October 1 through September 30) and are from Outlook for U.S. Agricultural Exports. 1997 and 1998 data are from *Foreign Agricultural Trade of the U.S.* 1. Not included in total volume. 2. Projection includes beef, pork, and variety meat. 3. Projection includes pulses.

4. Projection includes wheat flour. 5. Projection excludes grain products. 6. Projection includes lint. 7. Projection includes juice.

NOTE: Totals include transshipments through Canada, but transshipments are not distributed by commodity as previously.

NOTE: Adjusted transshipments through Canada for 1997 exports. Information Contact: Mary Fant (202) 694-5272

Table 28—U.S. Agricultural Exports by Region

	Fiscal year			1997			1998			
	1997	1998	1999F	Dec	Jul	Aug	Sep	Oct	Nov	Dec
	\$ million									
Region & country										
WESTERN EUROPE	9,617	8,844	7,500	1,024	459	456	479	804	818	841
European Union ¹	8,997	8,508	7,300	995	435	439	451	764	788	821
Belgium-Luxembourg	715	666	--	61	38	34	58	68	48	83
France	557	538	--	79	25	25	21	60	44	44
Germany	1,376	1,294	--	147	72	80	76	104	120	130
Italy	792	722	--	94	21	26	32	81	58	72
Netherlands	2,011	1,792	--	222	79	60	79	111	162	219
United Kingdom	1,289	1,300	--	130	102	95	86	135	128	85
Portugal	243	185	--	18	5	8	7	9	16	11
Spain, incl. Canary Islands	1,087	1,126	--	141	38	55	47	122	137	77
Other Western Europe	620	336	200	30	24	17	28	39	30	20
Switzerland	506	236	--	21	17	9	17	29	14	13
EASTERN EUROPE	317	320	300	26	26	16	11	16	23	25
Poland	164	139	--	11	12	5	3	6	8	3
Former Yugoslavia	72	97	--	8	6	6	3	6	6	12
Romania	37	31	--	1	2	3	1	1	2	2
NEWLY INDEPENDENT STATES	1,593	1,456	1,400	135	141	109	34	46	25	46
Russia	1,281	1,103	1,100	97	97	70	6	18	14	28
ASIA ²	26,436	21,954	16,800	2,072	1,493	1,523	1,301	1,954	1,869	1,913
West Asia (Mideast)	2,562	2,285	2,100	205	174	164	123	227	158	206
Turkey	742	658	600	58	48	72	34	54	48	51
Iraq	50	131	--	15	30	0	0	0	0	0
Israel, incl. Gaza and W. Bank	543	389	--	50	29	24	13	52	12	43
Saudi Arabia	630	535	500	30	33	32	34	58	41	55
South Asia	728	623	600	72	31	79	37	82	54	80
Bangladesh	123	114	--	6	9	6	11	30	15	28
India	152	163	--	9	7	31	13	20	14	38
Pakistan	418	275	--	54	8	30	6	26	18	12
China	1,774	1,514	1,300	117	57	68	51	239	121	79
Japan	10,713	9,459	8,000	852	681	626	589	697	786	794
Southeast Asia	3,136	2,282	2,000	248	183	181	128	193	190	211
Indonesia	768	529	400	84	50	50	31	50	32	60
Philippines	898	744	600	56	63	73	46	56	53	57
Other East Asia	7,523	5,790	4,900	579	366	405	372	515	560	543
Korea, Rep.	3,293	2,245	2,000	155	161	164	140	198	216	200
Hong Kong	1,640	1,568	1,300	155	105	100	128	129	137	142
Taiwan	2,588	1,971	1,600	268	99	141	104	188	203	200
AFRICA	2,265	2,167	1,900	258	174	185	193	179	165	213
North Africa	1,480	1,475	1,300	194	122	125	119	114	102	149
Morocco	166	139	--	20	20	13	2	7	12	15
Algeria	307	281	--	36	28	25	13	23	12	23
Egypt	928	939	900	124	73	84	99	83	67	103
Sub-Sahara	785	692	600	64	51	60	74	65	63	63
Nigeria	106	140	--	11	20	13	12	10	17	10
S. Africa	239	193	--	20	11	15	17	20	13	16
LATIN AMERICA and CARIBBEAN	9,984	11,348	11,400	1,111	970	822	822	1,074	1,035	1,142
Brazil	461	566	400	78	23	28	39	110	64	36
Caribbean Islands	1,473	1,487	--	134	131	114	105	148	114	135
Central America	1,029	1,137	--	81	94	81	87	98	125	128
Colombia	552	592	--	48	38	41	38	39	53	50
Mexico	5,077	5,956	6,700	563	546	460	456	539	556	633
Peru	178	314	--	32	33	29	35	39	35	39
Venezuela	552	516	500	35	55	32	24	45	40	53
CANADA	6,620	7,022	6,700	571	577	534	558	601	591	586
OCEANIA	534	545	500	45	38	49	49	56	47	42
TOTAL	57,365	53,730	49,000	5,243	3,884	3,704	3,467	4,859	4,671	4,827
Developed countries	28,243	26,530	--	2,567	1,794	1,707	1,718	2,349	2,359	2,337
Developing countries	25,717	24,211	--	2,421	1,891	1,818	1,662	2,224	2,158	2,364
Other countries	25,717	2,988	--	256	199	179	87	287	154	126

F = Forecast. -- = Not available. Based on fiscal year beginning October 1 and ending September 30. 1. Austria, Finland, and Sweden are included in the European Union. 2. Asia forecasts exclude West Asia (Mideast). NOTE: Adjusted for transshipments through Canada, but transshipments are not distributed as previously for 1998. Information contact: Mary Fant (202) 694-5272

Farm Income

Table 29—Value Added to the U.S. Economy by the Agricultural Sector

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	\$ billion									
Final crop output	83.3	81.0	89.0	82.4	100.3	95.8	115.6	112.5	104.6	102.2
Food grains	7.5	7.3	8.5	8.2	9.5	10.4	10.7	10.6	8.8	8.3
Feed crops	18.7	19.3	20.1	20.2	20.4	24.6	27.3	27.6	23.8	21.9
Cotton	5.5	5.2	5.2	5.2	6.7	6.9	7.0	6.5	5.6	6.1
Oil crops	12.3	12.7	13.3	13.2	14.7	15.5	16.4	19.9	17.6	16.3
Tobacco	2.7	2.9	3.0	2.9	2.7	2.5	2.8	2.9	2.9	2.6
Fruits and tree nuts	9.4	9.9	10.2	10.3	10.3	11.1	11.9	12.8	13.1	13.6
Vegetables	11.5	11.6	11.9	13.5	13.9	14.9	14.6	15.1	16.0	16.0
All other crops	12.8	13.1	13.7	14.0	14.9	15.2	15.9	16.7	16.8	17.2
Home consumption	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Value of inventory adjustment ¹	2.8	(1.2)	3.2	(5.3)	7.2	(5.4)	8.9	0.3	(0.1)	0.2
Final animal output	90.2	87.3	87.1	91.7	89.7	87.6	92.2	96.2	92.9	95.2
Meat animals	51.2	50.1	47.7	50.8	46.8	44.8	44.4	49.9	43.1	47.7
Dairy products	20.2	18.0	19.7	19.2	19.9	19.9	22.8	21.0	23.9	22.5
Poultry and eggs	15.3	15.2	15.5	17.3	18.4	19.1	22.3	22.2	22.8	22.4
Miscellaneous livestock	2.5	2.5	2.6	2.8	3.0	3.2	3.4	3.5	3.5	3.5
Home consumption	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.4
Value of inventory adjustment ¹	0.4	1.0	1.0	1.1	1.1	0.2	(1.1)	-0.7	-0.9	-1.2
Services and forestry	15.3	15.4	15.2	16.6	17.9	19.4	20.7	22.1	22.6	23.0
Machine hire and customwork	1.8	1.8	1.8	1.9	2.1	1.9	2.2	2.6	2.5	2.6
Forest products sold	1.8	1.8	2.2	2.6	2.7	2.9	2.8	2.8	2.9	3.1
Other farm income	4.5	4.7	4.2	4.6	4.4	5.2	5.9	6.3	6.3	5.9
Gross imputed rental value of farm dwellings	7.2	7.2	7.0	7.6	8.7	9.3	9.8	10.3	10.9	11.4
Final agricultural sector output²	188.7	183.7	191.3	190.7	207.9	202.8	228.5	230.8	220.1	220.4
<i>Minus</i> Intermediate consumption outlays:	92.9	94.6	93.5	100.6	104.9	109.0	112.9	118.6	113.6	114.2
Farm origin	39.5	38.6	38.6	41.2	41.3	41.6	42.7	45.7	43.2	43.6
Feed purchased	20.4	19.3	20.1	21.4	22.6	23.8	25.2	25.2	23.8	23.9
Livestock and poultry purchased	14.6	14.1	13.6	14.6	13.3	12.3	11.2	13.8	12.6	12.9
Seed purchased	4.5	5.1	4.9	5.2	5.4	5.5	6.2	6.7	6.8	6.9
Manufactured inputs	22.0	23.2	22.7	23.1	24.4	26.2	28.6	29.0	27.8	28.4
Fertilizers and lime	8.2	8.7	8.3	8.4	9.2	10.0	10.9	10.9	10.5	10.6
Pesticides	5.4	6.3	6.5	6.7	7.2	7.7	8.5	8.8	8.9	9.1
Petroleum fuel and oils	5.8	5.6	5.3	5.3	5.3	5.4	6.0	6.2	5.6	5.9
Electricity	2.6	2.6	2.6	2.7	2.7	3.0	3.2	3.0	2.7	2.8
Other intermediate expenses	31.4	32.8	32.2	36.2	39.2	41.2	41.5	43.9	42.7	42.2
Repair and maintenance of capital items	8.6	8.6	8.5	9.2	9.1	9.5	10.3	10.4	10.2	10.2
Machine hire and customwork	3.6	3.5	3.8	4.4	4.8	4.8	4.7	4.8	4.6	4.5
Marketing, storage, and transportation	4.2	4.7	4.5	5.6	6.8	7.2	6.9	7.1	6.9	7.0
Contract labor	1.6	1.6	1.7	1.8	1.8	2.0	2.1	2.6	2.7	2.7
Miscellaneous expenses	13.5	14.3	13.7	15.2	16.7	17.8	17.5	19.0	18.2	17.7
<i>Plus</i> Net government transactions:	3.1	2.1	2.7	6.9	1.0	0.1	0.1	0.1	5.5	2.6
+ Direct government payments	9.3	8.2	9.2	13.4	7.9	7.3	7.3	7.5	12.9	10.2
- Motor vehicle registration and licensing fees	0.4	0.3	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.5
- Property taxes	5.9	5.8	6.1	6.2	6.5	6.7	6.8	7.0	7.0	7.1
Gross value added	98.9	91.2	100.5	97.0	104.0	93.9	115.7	112.3	112.0	108.8
<i>Minus</i> Capital consumption	18.1	18.2	18.3	18.4	18.7	19.1	19.4	19.5	19.6	19.9
Net value added²	80.7	73.0	82.1	78.6	85.3	74.8	96.3	92.8	92.3	88.9
<i>Minus</i> Factor payments:	36.0	34.4	34.6	35.1	37.0	38.8	42.9	42.9	44.4	44.4
Employee compensation (total hired labor)	12.5	12.3	12.3	13.2	13.5	14.3	15.4	16.0	16.9	17.3
Net rent received by nonoperator landlords	10.0	9.9	11.2	11.0	11.8	11.8	14.3	13.2	13.4	13.4
Real estate and non-real estate interest	13.4	12.1	11.1	10.8	11.7	12.7	13.2	13.7	14.1	13.7
Net farm income²	44.7	38.6	47.5	43.6	48.3	36.0	53.4	49.8	48.0	44.6

Values in last two columns are preliminary or forecast. 1. A positive value of inventory change represents current-year production not sold by December 1. A negative value is an offset to production from prior years included in current-year sales. 2. Final sector output is the gross value of commodities and services produced within a year. Net value added is the sector's contribution to the National economy and is the sum of income from production earned by all factors of production. Net farm income is the farm operators' share of income from the sector's production activities. The concept presented is consistent with that employed by the Organization for Economic Cooperation and Development. Information contact: Roger Strickland (202)694-5592 or rogers@econ.ag.gov

Table 30—Farm Income Statistics

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	\$ billion									
Cash income statement:										
1. Cash receipts	169.5	167.9	171.4	177.8	181.2	188.1	199.6	208.7	198.0	198.0
Crops ¹	80.3	82.1	85.7	87.6	93.1	101.1	106.6	112.1	104.7	102.0
Livestock	89.2	85.8	85.6	90.2	88.2	87.0	93.0	96.6	93.4	96.0
2. Direct Government payments	9.3	8.2	9.2	13.4	7.9	7.3	7.3	7.5	12.9	10.2
3. Farm-related income ²	8.1	8.3	8.2	9.0	9.2	10.1	10.9	11.8	11.8	11.6
4. Gross cash income (1+2+3)	186.9	184.3	188.7	200.2	198.3	205.5	217.8	228.0	222.7	219.8
5. Cash expenses ³	134.1	134.0	133.6	141.2	147.6	153.6	161.4	167.2	163.6	164.3
6. Net cash income (4-5)	52.8	50.4	55.1	59.0	50.7	51.8	56.4	60.8	59.1	55.5
Farm income statement:										
7. Gross cash income (4)	186.9	184.3	188.7	200.2	198.3	205.5	217.8	228.0	222.7	219.8
8. Noncash income ⁴	7.9	7.8	7.6	8.1	9.2	9.8	10.2	10.7	11.3	11.9
9. Value of inventory adjustment	3.3	-0.2	4.2	-4.2	8.3	-5.1	7.8	-0.4	-1.0	-1.0
10. Gross farm income (7+8+9)	198.0	191.9	200.5	204.1	215.8	210.1	235.8	238.3	233.1	230.6
11. Total production expenses	153.3	153.3	152.9	160.5	167.5	174.1	182.4	188.4	185.1	186.1
12. Net farm income (10-11)	44.7	38.6	47.5	43.6	48.3	36.0	53.4	49.8	48.0	44.6

Values for last 2 years are preliminary or forecasts. Numbers in parentheses indicate the combination of items required to calculate an item. Totals may not add due to rounding. 1. Includes commodities placed under CCC loans and profits made on loans redeemed. 2. Income from custom labor, machine hire, recreational activities, forest product sales, and other farm sources. 3. Excludes depreciation and perquisites to hired labor. Excludes farm operator dwellings. 4. Value of farm products consumed on farms where produced plus the imputed rental value of farm dwellings. *Information contact:*

Roger Strickland (202) 694-5592 or rogers@econ.ag.gov

Table 31—Average Income to Farm Operator Households¹

	1992	1993	1994	1995	1996	1997	1998	1999
	\$ per farm							
Net cash farm business income ²	11,320	11,248	11,389	11,218	13,502	12,460	--	--
Less depreciation ³	5,187	6,219	6,466	6,795	6,906	6,578	--	--
Less wages paid to operator ⁴	216	454	425	522	531	513	--	--
Less farmland rental income ⁵	360	534	701	769	672	568	--	--
Less adjusted farm business income due to other household(s) ⁶	961	872	815	649	1,094	1,429	--	--
	\$ per farm operator household							
Equals adjusted farm business income	4,596	3,168	2,981	2,484	4,300	3,373	--	--
Plus wages paid to operator	216	454	425	522	531	513	--	--
Plus net income from farmland rental ⁷	360	--	--	1,053	1,178	945	--	--
Equals farm self-employment income	5,172	3,623	3,407	4,059	6,009	4,831	--	--
Plus other farm-related earnings ⁸	2,008	1,192	970	661	1,898	1,158	--	--
Equals earnings of the operator household from farming activities	7,180	4,815	4,376	4,720	7,906	5,989	5,757	5,122
Plus earnings of the operator household from off-farm sources ⁹	35,731	35,408	38,092	39,671	42,455	46,358	45,060	46,651
Equals average farm operator household income	42,911	40,223	42,469	44,392	50,361	52,347	50,816	51,773
	\$ per U.S. household							
U.S. average household income ¹⁰	38,840	41,428	43,133	44,938	47,123	49,692	--	--
	Percent							
Average farm operator household income as percent of U.S. average household income	110.5	97.1	98.5	98.8	106.9	105.3	--	--
Average operator household earnings from farming activities as percent of average operator household income	16.7	12.0	10.3	10.6	15.7	11.4	--	--

-- = Not available. Values in the last 3 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 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 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 rental 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 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: USDA, Economic Research Service, 1992, 1993, 1994, and 1995 Farm Costs and Returns Survey (FCRS), and 1996 and 1997 Agricultural Resource Management Study for farm operator household data. U.S. Department of Commerce, Bureau of Economic Analysis, Current Population Survey (PCS), for average household income. *Information contact:* Bob Hoppe (202) 694-5572 or rhoppe@econ.ag.gov

Table 32—Balance Sheet of the U.S. Farming Sector

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	\$ billion									
Farm assets	841.5	844.9	870.3	906.4	938.3	981.9	1,033.9	1,088.8	1,124.7	1,140.3
Real estate	620.0	625.5	642.8	673.7	706.9	755.7	799.5	849.2	891.7	904.1
Livestock and poultry ¹	70.9	68.1	71.0	72.8	67.9	57.8	60.3	66.8	57.0	59.0
Machinery and motor vehicles	86.3	85.9	85.4	86.5	87.5	88.5	88.9	88.1	91.0	90.0
Crops stored ^{2,3}	23.2	22.2	24.2	23.3	23.3	27.4	31.7	29.9	30.0	31.0
Purchased inputs	2.8	2.6	3.9	3.8	5.0	3.4	4.4	5.1	5.0	5.2
Financial assets	38.3	40.5	43.1	46.3	47.6	49.1	49.1	49.7	50.0	51.0
Total farm debt	138.0	139.2	139.1	142.0	146.8	150.8	156.1	165.4	170.4	169.1
Real estate debt ³	74.7	74.9	75.4	76.0	77.7	79.3	81.7	85.4	87.6	86.7
Non-real estate debt ⁴	63.2	64.3	63.6	65.9	69.1	71.5	74.4	80.1	82.8	82.4
Total farm equity	703.5	705.7	731.3	764.4	791.5	831.1	877.8	923.4	954.3	971.2
	Percent									
Selected ratios										
Debt to equity	19.6	19.7	19.0	18.6	18.5	18.1	17.8	17.9	17.9	17.4
Debt to assets	16.4	16.5	16.0	15.7	15.6	15.4	15.1	15.2	15.2	14.8

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. Includes CCC storage and drying facilities loans, but excludes debt on operator dwellings. 4. Excludes debt for nonfarm purposes. Information contact: Ken Erickson (202) 694-5565 or erickson@econ.ag.gov

Table 33—Cash Receipts from Farming

	Annual			1997	1998					
	1995	1996	1997	Nov	Jun	Jul	Aug	Sep	Oct	Nov
	\$ million									
Commodity sales ¹	188,108	199,580	208,665	21,745	14,726	14,794	14,986	16,613	20,890	19,768
Livestock and products	87,018	93,005	96,568	8,518	7,770	7,242	7,838	7,830	7,608	7,965
Meat animals	44,828	44,414	49,925	4,363	3,841	2,915	3,534	3,573	3,035	3,332
Dairy products	19,894	22,820	20,989	1,800	1,883	1,860	1,991	2,043	2,250	2,231
Poultry and eggs	19,070	22,345	22,183	1,912	1,772	1,903	2,034	1,908	2,090	1,955
Other	3,227	3,425	3,471	443	275	564	280	305	234	447
Crops	101,090	106,575	112,097	13,226	6,956	7,552	7,147	8,784	13,282	11,803
Food grains	10,417	10,741	10,603	653	981	1,557	925	708	614	582
Feed crops	24,581	27,265	27,638	3,415	1,618	1,472	1,545	1,431	2,774	2,809
Cotton (lint and seed)	6,851	6,983	6,515	1,358	199	113	88	206	770	986
Tobacco	2,548	2,796	2,886	296	0	66	431	591	365	207
Oil-bearing crops	15,496	16,362	19,911	2,317	950	857	605	1,286	3,791	1,908
Vegetables and melons	14,913	14,561	15,086	904	1,403	1,471	1,583	1,577	1,610	937
Fruits and tree nuts	11,119	11,933	12,790	1,895	912	1,068	1,025	1,451	1,748	1,981
Other	15,165	15,935	16,668	2,388	893	948	945	1,534	1,610	2,392
Government payments	7,279	7,340	7,496	34	83	157	1,702	1,809	1,980	3,498
Total	195,388	206,919	216,160	21,779	14,810	14,951	16,688	18,422	22,870	23,266

Annual values for the most recent year and monthly values for the current year are preliminary. 1. 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—Cash Receipts from Farm Marketings, by State

Region and State	Livestock and products				Crops ¹				Total ¹			
	1996	1997	Oct 1998	Nov 1998	1996	1997	Oct 1998	Nov 1998	1996	1997	Oct 1998	Nov 1998
\$ million												
NORTH ATLANTIC												
Maine	262	258	21	22	220	228	25	18	482	486	46	40
New Hampshire	72	69	6	7	97	97	12	9	169	166	17	16
Vermont	433	416	43	41	99	97	11	14	532	513	54	55
Massachusetts	110	102	8	8	392	430	54	76	502	532	62	84
Rhode Island	11	9	1	1	73	74	5	5	84	83	6	6
Connecticut	236	218	18	21	253	279	19	20	489	496	38	41
New York	2,050	1,859	194	196	981	1,037	108	92	3,031	2,896	302	288
New Jersey	196	180	15	15	607	596	52	58	803	776	67	73
Pennsylvania	2,865	2,789	255	247	1,283	1,339	111	128	4,148	4,128	366	375
NORTH CENTRAL												
Ohio	1,943	1,869	155	151	2,853	3,476	457	362	4,796	5,345	613	513
Indiana	1,913	1,896	144	138	3,620	3,610	626	442	5,533	5,506	770	580
Illinois	2,063	1,937	113	100	6,453	7,339	789	427	8,516	9,276	903	527
Michigan	1,450	1,352	112	105	2,154	2,236	283	345	3,604	3,588	395	450
Wisconsin	4,299	4,070	399	416	1,732	1,686	214	296	6,030	5,756	613	712
Minnesota	4,147	4,054	292	298	4,654	4,101	544	611	8,800	8,155	836	908
Iowa	5,451	5,530	318	336	6,698	7,311	1,005	722	12,148	12,841	1,323	1,058
Missouri	2,463	2,795	180	190	2,409	2,768	329	262	4,872	5,564	510	452
North Dakota	539	611	44	50	2,891	2,702	288	346	3,429	3,313	332	396
South Dakota	1,634	1,820	113	134	1,875	2,417	442	245	3,509	4,237	555	379
Nebraska	5,277	5,542	365	409	3,933	4,550	505	443	9,211	10,092	870	853
Kansas	4,541	5,017	347	393	2,978	3,985	365	289	7,519	9,001	711	682
SOUTHERN												
Delaware	573	573	56	42	180	174	25	18	753	748	81	61
Maryland	901	915	91	79	639	623	71	58	1,540	1,538	163	137
Virginia	1,477	1,538	133	128	907	863	136	73	2,384	2,401	268	201
West Virginia	309	324	32	27	79	71	5	6	388	394	38	34
North Carolina	4,431	4,694	344	300	3,466	3,608	503	321	7,897	8,302	847	622
South Carolina	748	797	73	67	869	898	81	61	1,616	1,695	154	128
Georgia	3,279	3,442	334	281	2,452	2,445	361	218	5,731	5,887	695	499
Florida	1,206	1,265	90	102	5,038	4,978	230	347	6,244	6,243	320	450
Kentucky	1,727	1,978	83	309	1,842	1,655	94	195	3,569	3,633	177	503
Tennessee	999	1,005	70	69	1,406	1,287	171	173	2,405	2,292	241	242
Alabama	2,362	2,431	235	194	808	796	117	90	3,170	3,227	352	284
Mississippi	1,934	2,006	195	173	1,504	1,470	247	161	3,438	3,476	442	334
Arkansas	3,374	3,416	294	271	2,470	2,446	408	380	5,844	5,862	702	651
Louisiana	688	659	44	48	1,641	1,481	182	195	2,328	2,140	226	243
Oklahoma	2,414	3,061	184	240	1,105	1,308	82	79	3,519	4,369	266	319
Texas	7,821	8,184	673	711	5,139	5,277	454	507	12,960	13,461	1,127	1,218
WESTERN												
Montana	797	991	57	68	1,203	1,072	83	105	1,999	2,063	140	173
Idaho	1,330	1,389	120	133	2,043	1,926	234	287	3,372	3,315	354	420
Wyoming	478	646	49	38	189	199	15	53	667	845	63	91
Colorado	2,763	3,012	206	234	1,362	1,388	125	143	4,125	4,399	331	377
New Mexico	1,198	1,354	91	94	506	562	53	59	1,704	1,915	144	153
Arizona	840	888	56	74	1,306	1,257	83	116	2,145	2,145	138	191
Utah	644	715	75	68	228	238	26	20	872	953	101	88
Nevada	154	180	19	12	132	130	14	13	287	310	33	25
Washington	1,665	1,604	157	163	3,833	3,778	427	313	5,497	5,382	584	475
Oregon	658	740	60	63	2,246	2,373	338	278	2,904	3,113	398	341
California	6,212	6,294	641	691	17,285	18,995	2,433	2,284	23,497	25,289	3,074	2,975
Alaska	6	6	1	1	23	26	2	2	29	32	3	3
Hawaii	66	68	6	6	420	415	37	36	487	483	43	41
U.S.	93,005	96,568	7,608	7,965	106,575	112,097	13,282	11,803	199,580	208,665	20,890	19,768

Estimates as of end of current month. Totals may not add because of rounding. 1. 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 35—CCC Net Outlays by Commodity & Function

	Fiscal year									
	1991	1992	1993	1994	1995	1996	1997	1998	1999 E	2000 E
	\$ million									
COMMODITY/PROGRAM										
Feed grains:										
Corn	2,387	2,105	5,143	625	2,090	2,021	2,587	2,873	4,894	3,087
Grain sorghum	243	190	410	130	153	261	284	296	474	311
Barley	71	174	186	202	129	114	109	168	316	148
Oats	12	32	16	5	19	8	8	17	32	20
Corn and oat products	9	9	10	10	1	0	0	0	0	0
Total feed grains	2,722	2,510	5,765	972	2,392	2,404	2,988	3,354	5,716	3,566
Wheat and products	2,805	1,719	2,185	1,729	803	1,491	1,332	2,187	2,918	1,291
Rice	867	715	887	836	814	499	459	491	707	433
Upland cotton	382	1,443	2,239	1,539	99	685	561	1,132	1,629	781
Tobacco	-143	29	235	693	-298	-496	-156	376	-254	-143
Dairy	839	232	253	158	4	-98	67	291	435	528
Soybeans	40	-29	109	-183	77	-65	5	139	450	2,339
Peanuts	48	41	-13	37	120	100	6	-11	1	0
Sugar	-20	-19	-35	-24	-3	-63	-34	-30	-48	-41
Honey	19	17	22	0	-9	-14	-2	0	1	-1
Wool and mohair	172	191	179	211	108	55	0	0	6	-6
Operating expense ¹	625	6	6	6	6	6	6	5	4	4
Interest expenditure	745	532	129	-17	-1	140	-111	76	152	181
Export programs ²	733	1,459	2,193	1,950	1,361	-422	125	212	960	1,014
1988/98 Disaster/tree/ livestock assistance	121	1,054	944	2,566	660	95	130	3	2,609	4
Conservation Reserve Program	0	0	0	0	0	2	1,671	1,693	1,508	1,578
Other conservation programs	0	0	0	0	0	7	105	197	309	366
Other	155	-162	949	-137	-103	320	104	28	1,101	531
Total	10,110	9,738	16,047	10,336	6,030	4,646	7,256	10,143	18,204	12,425
Function										
Price support loans (net)	418	584	2,065	527	-119	-951	110	1,128	55	982
Cash direct payments: ³										
Production flexibility contract	0	0	0	0	0	5,141	6,320	5,672	5,544	5,042
Marketing loss assistance	0	0	0	0	0	0	0	0	3,058	0
Deficiency	6,224	5,491	8,607	4,391	4,008	567	-1,118	-7	0	0
Diversion	0	0	0	0	0	0	0	0	0	0
Dairy termination	96	2	0	0	0	0	0	0	0	0
Loan deficiency	21	214	387	495	29	0	0	478	1,804	2,713
Other	0	140	149	171	97	95	7	416	288	10
Conservation Reserve Program	0	0	0	0	0	2	1,671	1,693	1,508	1,578
Other conservation programs	0	0	0	0	0	0	85	156	260	310
Noninsured Assistance (NAP)	0	0	0	0	0	2	52	23	67	89
Total direct payments	6,341	5,847	9,143	5,057	4,134	5,807	7,017	8,431	12,529	9,742
1988-98 crop disaster	6	960	872	2,461	584	14	2	-2	2,375	0
Emergency livestock/tree/DRAP										
livestock indemn/forage assist.	115	94	72	105	76	81	128	5	234	4
Purchases (net)	646	321	525	293	-51	-249	-60	207	737	11
Producer storage payments	1	14	9	12	23	0	0	0	0	0
Processing, storage, and transportation	240	185	136	112	72	51	33	38	84	42
Export donations ocean transportation	50	139	352	156	50	69	34	40	681	65
Operating expense ¹	625	6	6	6	6	6	6	5	4	4
Interest expenditure	745	532	129	-17	-1	140	-111	76	152	181
Export programs ²	733	1,459	2,193	1,950	1,361	-422	125	212	960	1,014
Other	190	-403	545	-326	-105	100	-28	3	393	380
Total	10,110	9,738	16,047	10,336	6,030	4,646	7,256	10,143	18,204	12,425

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 Access (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. Includes cash payments only. Excludes generic certificates in FY 86-96. E=Estimated in the FY 2000 President's Budget which was released on February 1, 1999 based on November 1998 supply and demand estimates. The CCC outlays shown for 1996-2000 include the impact of the Federal Agricultural 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). Information contact: Richard Pazdalski Farm Service Agency - Budget at (202) 720-3675 c Richard_Pazdalski@wdc.fsa.usda.gov. Further detail can be found at www.fsa.usda.gov/dam/BUD/bud1.htm

Food Expenditures

Table 36—Food Expenditures

	Annual			1998		1999	Year-to-date cumulative		
	1996	1997 P	1998 P	Nov	Dec P	Jan P	Nov	Dec P	Jan P
\$ billion									
Sales ¹									
At home ²	367.6	380.2	394.2	33.4	35.7	29.3	358.5	394.2	29.3
Away from home ³	288.5	297.9	301.7	24.7	25.3	24.0	276.4	301.7	25.3
1995 \$ billion									
Sales ¹									
At home ²	367.4	371.0	377.4	31.8	33.9	27.8	343.5	377.4	27.8
Away from home ³	288.5	289.7	286.0	23.2	23.7	22.5	262.3	286.0	22.5
Percent change from year earlier (\$ billion)									
Sales ¹									
At home ²	3.8	3.4	3.7	3.4	0.2	-5.3	4.0	3.7	3.0
Away from home ³	2.7	3.0	1.3	4.1	1.5	3.3	1.3	1.3	1.4
Percent change from year earlier (1995 \$ billion)									
Sales ¹									
At home ²	0.1	1.0	1.7	1.2	-1.9	-6.3	2.1	1.7	1.1
Away from home ³	0.3	0.2	-1.3	1.5	-1.0	0.9	-1.3	-1.3	-1.1

R = Revised. 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, while 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," ERS Agr. Econ. Rpt. No. 575, Aug. 1987.

Transportation

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

	Annual			1997		1998				
	1996	1997	1998	Dec R	Jul R	Aug R	Sep R	Oct R	Nov	Dec
Rail freight rate index ¹ (Dec. 1984=100)										
All products	111.5	112.1	113.4	112.6	113.6	113.5	113.7	113.4	113.3	113.1
Farm products	115.9	120.3	123.8	124.4	124.9	124.9	124.7	120.9	121.1	123.8
Food products	108.8	107.6	107.4	108.5	106.5	106.5	106.5	107.2	107.2	107.4
Grain shipments										
Rail carloadings (1,000 cars) ²	25.2	23.2	22.8	23.0	21.4	22.3	21.7	26.5	24.9	22.8
Barge shipments (mil. ton) ^{3,4}	3.1	2.6	3.0	--	3.6	3.7	1.4	3.3	4.6	3.5
Fresh fruit and vegetable shipments ⁵										
Piggy back (mil. cwt)	1.1	1.1	0.9	0.8	0.8	0.6	0.9	0.8	0.8	0.9
Rail (mil. cwt)	1.6	1.7	1.2	1.7	1.5	0.4	0.8	1.3	1.5	1.4
Truck (mil. cwt)	35.7	42.6	42.3	39.0	43.0	39.6	36.3	41.2	40.2	40.6

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. Annual 1996 is 7-month

average. 5. Agricultural Marketing Service, USDA. *Information contact: Jenny Gonzales (202) 694-5296*

Indicators of Farm Productivity

Table 38—Indexes of Farm Production, Input Use, & Productivity¹

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
	1992=100									
Farm output	88	83	89	94	94	100	94	107	101	106
All livestock products	92	93	94	95	98	100	100	108	110	109
Meat animals	95	97	97	96	99	100	100	102	103	100
Dairy products	94	96	95	98	98	100	99	114	115	115
Poultry and eggs	81	83	86	92	96	100	104	110	114	119
All crops	86	75	86	92	92	100	90	106	96	103
Feed crops	84	62	85	88	86	100	76	102	83	98
Food crops	84	76	83	107	82	100	96	97	90	93
Oil crops	88	72	88	87	94	100	85	115	99	107
Sugar	95	91	91	92	96	100	95	106	98	94
Cotton and cottonseed	92	96	75	96	109	100	100	122	110	117
Vegetables and melons	90	81	85	93	97	100	97	113	108	112
Fruit and nuts	95	102	98	97	96	100	107	111	102	102
Farm input ¹	101	100	100	101	102	100	101	102	101	100
Farm labor	101	103	104	102	106	100	96	96	92	100
Farm real estate	100	100	102	101	100	100	98	99	98	99
Durable equipment	120	113	108	105	103	100	97	94	92	89
Energy	102	102	101	100	101	100	100	103	109	104
Fertilizer	106	97	94	97	98	100	111	109	85	89
Pesticides	92	79	93	90	100	100	97	103	94	106
Feed, seed, and purchased livestock	97	96	91	99	99	100	101	102	109	95
Inventories	102	98	93	97	100	100	104	99	108	104
Farm output per unit of input	87	83	90	93	92	100	94	105	100	106
Output per unit of labor										
Farm ²	87	81	86	92	89	100	98	111	110	106
Nonfarm ³	95	95	96	96	97	100	100	101	--	--

Values for latest year preliminary. 1. Includes miscellaneous items not shown separately. 2. Source: Economic Research Service. 3. Source: Bureau of Labor Statistics. *Information contact: John Jones (202) 694-5614*

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Food Supply & Use

Table 39—Per Capita Consumption of Major Food Commodities¹

Commodity	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
	<i>Lbs.</i>									
Red meats ^{2,3,4}	119.5	115.9	112.3	111.9	114.1	112.2	114.8	115.1	112.8	111.0
Beef	68.6	65.4	63.9	63.1	62.8	61.5	63.6	64.4	65.0	63.8
Veal	1.1	1.0	0.9	0.8	0.8	0.8	0.8	0.8	1.0	0.9
Lamb & mutton	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8
Pork	48.8	48.4	46.4	46.9	49.5	48.9	49.6	49.0	45.9	45.6
Poultry ^{2,3,4}	51.9	53.9	56.3	58.3	60.8	62.5	63.3	62.9	64.4	64.8
Chicken	39.6	40.9	42.4	44.2	46.7	48.5	49.3	48.8	49.8	50.9
Turkey	12.4	13.1	13.8	14.1	14.1	14.0	14.1	14.1	14.6	13.9
Fish and shellfish ³	15.1	15.6	15.0	14.8	14.7	14.9	15.1	14.9	14.7	14.5
Eggs ⁴	31.8	30.5	30.2	30.1	30.3	30.4	30.6	30.2	30.5	30.7
Dairy products										
Cheese (excluding cottage) ^{2,5}	23.7	23.8	24.6	25.0	26.0	26.2	26.8	27.3	27.7	28.0
American	11.5	11.0	11.1	11.1	11.3	11.4	11.5	11.8	12.0	12.0
Italian	8.1	8.5	9.0	9.4	10.0	9.8	10.3	10.4	10.8	11.0
Other cheeses ⁶	4.1	4.3	4.5	4.6	4.7	5.0	5.0	5.0	5.0	5.1
Cottage cheese	3.9	3.6	3.4	3.3	3.1	2.9	2.8	2.7	2.6	2.7
Beverage milks ²	222.3	224.2	221.8	221.1	218.3	213.4	213.6	209.8	210.0	206.9
Fluid whole milk ⁷	105.7	97.5	90.4	87.3	84.0	80.1	78.8	75.3	74.6	72.7
Fluid lower fat milk ⁸	100.5	106.5	108.5	109.9	109.3	106.6	106.1	102.6	101.7	99.8
Fluid skim milk	16.1	20.2	22.9	23.9	25.0	26.7	28.7	31.9	33.7	34.4
Fluid cream products ⁹	7.6	7.8	7.6	7.7	8.0	8.0	8.1	8.4	8.7	9.1
Yogurt (excluding frozen)	4.5	4.2	4.0	4.2	4.2	4.3	4.7	5.1	4.8	5.1
Ice cream	17.3	16.1	15.8	16.3	16.3	16.1	16.1	15.7	15.9	16.2
Lowfat ice cream ¹⁰	8.0	8.4	7.7	7.4	7.1	6.9	7.6	7.5	7.6	7.9
Frozen yogurt	--	2.0	2.8	3.5	3.1	3.5	3.5	3.5	2.6	2.1
All dairy products, milk equivalent, milkfat basis ¹¹	582.5	563.8	568.4	565.6	565.9	574.1	586.0	584.4	575.5	579.8
Fats and oils--total fat content	63.6	60.8	62.8	65.4	67.4	70.2	68.6	66.9	65.8	65.6
Butter and margarine (product weight)	14.8	14.6	15.3	15.0	15.4	15.8	14.7	13.7	13.5	12.8
Shortening	21.5	21.5	22.2	22.4	22.4	25.1	24.1	22.5	22.3	20.9
Lard and edible tallow (direct use)	2.6	2.1	2.4	3.1	4.1	3.9	4.7	4.9	5.3	4.7
Salad and cooking oils	26.3	24.4	24.8	26.7	27.2	26.8	26.3	26.9	26.1	28.7
Fruits and vegetables ¹²	635.9	657.3	656.3	660.5	661.1	685.1	689.1	690.4	706.1	710.8
Fruit	272.8	279.1	273.5	266.6	268.0	285.4	284.3	285.4	289.8	294.7
Fresh fruits	120.9	122.8	116.3	113.0	123.5	124.9	126.5	124.6	129.0	133.2
Canned fruit	21.1	21.3	21.0	19.8	22.9	20.7	21.0	17.5	18.8	20.5
Dried fruit	14.9	13.2	12.1	12.3	10.8	12.6	12.9	12.8	11.4	10.8
Frozen fruit	3.6	3.9	3.7	3.6	3.7	3.6	3.6	4.0	3.8	3.5
Selected fruit juices	112.0	117.6	120.1	117.6	106.4	123.3	119.9	126.2	126.6	126.1
Vegetables	363.1	378.2	382.8	393.9	393.2	399.8	404.8	405.0	416.2	416.0
Fresh	167.4	172.2	167.2	167.2	171.1	171.9	177.4	175.1	181.8	185.6
Canning	94.8	102.4	110.7	113.3	111.6	112.1	107.8	110.2	108.5	105.9
Freezing	64.2	67.6	66.8	72.7	70.8	75.1	79.5	79.9	83.9	81.5
Dehydrated and chips	29.2	29.8	31.0	32.8	31.5	32.9	31.7	31.3	34.0	34.5
Pulses	7.5	6.3	7.1	7.8	8.2	7.7	8.5	8.5	8.0	8.5
Peanuts (shelled)	6.9	7.0	6.0	6.5	6.2	6.0	5.8	5.7	5.7	5.8
Tree nuts (shelled)	2.3	2.2	2.4	2.2	2.2	2.2	2.3	1.9	2.0	2.2
Flour and cereal products ¹³	175.5	174.5	182.0	183.6	186.2	191.0	194.0	192.5	198.4	200.1
Wheat flour	131.7	129.6	136.0	136.9	138.8	143.3	144.5	141.8	148.8	149.7
Rice (milled basis)	14.3	15.2	16.2	16.8	17.5	17.6	19.2	20.1	18.9	19.5
Caloric sweeteners ¹⁴	132.7	133.1	137.0	137.9	141.2	144.4	147.4	149.9	150.7	154.1
Coffee (green bean equiv.)	9.8	10.1	10.3	10.3	10.0	9.1	8.2	8.0	8.9	9.3
Cocoa (chocolate liquor equiv.)	3.8	4.0	4.3	4.6	4.6	4.3	3.9	3.6	4.2	4.1

-- = Not available. 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, sour cream, and dip. 10. Formerly known as ice milk. 11. Includes condensed and evaporated milk and dry milk products. 12. Farm weight. 13. Includes rye, corn, oats, and barley products. Excludes quantities used in alcoholic beverages, corn sweeteners, and fuel. 14. Dry weight equivalent.

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