

United States  
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Agriculture

Office of the  
Chief Economist

Staff Report  
WAOB-2002-1

# USDA Agricultural Baseline Projections to 2011

## Interagency Agricultural Projections Committee

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*USDA Baseline* 

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### **Abstract**

This report provides long-run baseline projections for the agricultural sector through 2011. Projections cover agricultural commodities, agricultural trade, and aggregate indicators of the sector, such as farm income and food prices. The projections are based on specific assumptions regarding macroeconomic conditions, policy, weather, and international developments. The baseline assumes that there are no shocks due to abnormal weather or other factors affecting global supply and demand. The projections assume that agricultural law of the 1996 Farm Act remains in effect throughout the baseline. The baseline projections presented are one representative scenario for the agricultural sector for the next decade. As such, the baseline provides a point of departure for discussion of alternative farm sector outcomes that could result under different assumptions. The projections in this report were prepared in September through November 2001, reflecting a composite of model results and judgment-based analysis.

Slow U.S. and global economic growth through 2002 and a continued strong U.S. dollar provide a weak backdrop for the agricultural sector in the initial years of the baseline. In addition, large world production and increasing global stocks have pressured prices for some agricultural commodities, such as soybeans and cotton. In contrast, a reduction in global stocks of wheat and coarse grains since the late 1990s has strengthened prices for those grains. U.S. agricultural export value and market cash receipts to U.S. farmers have improved since the late 1990s when large global production and weak global demand pushed prices and trade down. Government payments to the sector, through marketing loan benefits and emergency and disaster assistance, have added to farm income during this period. However, lower farm income is projected over the next several years in the absence of further ad hoc government assistance. Longer run developments in the agricultural sector reflect strengthening domestic and international macroeconomic performance. While strong export competition and a strong U.S. dollar are projected to continue, improving global economic growth, particularly in developing countries, provides a foundation for gains in trade and U.S. agricultural exports, resulting in rising market prices, increases in farm income, and improvement in the financial condition of the U.S. agricultural sector.

**Keywords:** Projections, baseline, crops, livestock, trade, farm income, food prices.

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## **A Note to Users of USDA Baseline Projections**

USDA long-term agricultural baseline projections presented in this report are a Departmental consensus on a long-run scenario for the agricultural sector. These projections provide a starting point for discussion of alternative outcomes for the sector.

The scenario presented in this report is not a USDA forecast about the future. Instead, it is a conditional, long-run scenario about what would be expected to happen under a continuation of the 1996 Farm Act and specific assumptions about external conditions. The baseline includes short-term projections from the October 2001 *World Agricultural Supply and Demand Estimates* report. Trade projections in this report for 2002/03 incorporate long-term assumptions concerning weather, foreign trend yields, and foreign use and do not reflect short-term conditions that may affect trade that year. The baseline assumes no accession to the World Trade Organization by China or Taiwan. Also, effects of the recent currency devaluation in Argentina are not included.

Critical long-term assumptions are made for:

- U.S. and international macroeconomic conditions;
- U.S. and foreign agricultural and trade policies;
- Growth rates of agricultural productivity in the United States and abroad; and
- Weather.

Changes in assumptions for any of these items can significantly affect the baseline projections, and actual conditions that emerge will alter the outcomes.

The baseline projections analysis was conducted by interagency committees in USDA and reflects a composite of model results and judgment-based analysis. The Economic Research Service has the lead role in preparing the Departmental baseline report. The projections and the report were reviewed and cleared by the Interagency Agricultural Projections Committee, chaired by the World Agricultural Outlook Board. USDA participants in the baseline projections analysis and review include the World Agricultural Outlook Board, the Economic Research Service, the Farm Service Agency, the Foreign Agricultural Service, the Office of the Chief Economist, the Office of Budget and Program Analysis, the Risk Management Agency, the Agricultural Marketing Service, the Natural Resources Conservation Service, and the Cooperative State Research, Education, and Extension Service.

### **Baseline Projections on the Internet**

The new USDA baseline projections are available electronically on the Internet at:

<http://usda.mannlib.cornell.edu/data-sets/baseline/>

Also, the Economic Research Service has a briefing room for baseline projections at:

<http://www.ers.usda.gov/briefing/baseline/>

### **Baseline Contacts**

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### **Acknowledgments**

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# **USDA Agricultural Baseline Projections to 2011**

## **Interagency Agricultural Projections Committee**

### **Introduction**

This report provides long-run baseline projections for the agricultural sector through 2011. Projections cover agricultural commodities, agricultural trade, and aggregate indicators of the sector, such as farm income and food prices.

The projections are a conditional scenario with no shocks and are based on specific assumptions regarding the macroeconomy, agricultural policy, the weather, and international developments. In particular, the baseline incorporates provisions of the Federal Agriculture Improvement and Reform Act of 1996 (1996 Farm Act) and assumes that current farm legislation remains in effect through the projections period. The projections are not intended to be a Departmental forecast of what the future will be, but instead a description of what would be expected to happen under a continuation of the 1996 Farm Act, with very specific external circumstances. Thus, the baseline provides a point of departure for discussion of alternative farm sector outcomes that could result under different domestic or international assumptions.

The projections in this report were prepared in September through November 2001 in conjunction with the fiscal year 2003 budget analysis. Projections reflect a composite of model results and judgment-based analysis. Normal weather is assumed. The baseline assumes no accession to the World Trade Organization by China or Taiwan. Also, the baseline does not reflect effects of the recent currency devaluation in Argentina. Short-term projections included in the baseline are from the October 2001 *World Agricultural Supply and Demand Estimates* report.

### **Summary of Projections**

In the initial years of the baseline projections, slow U.S. and global economic growth and a continued strong U.S. dollar provide a weak backdrop for the agricultural sector. In addition, large world production and increasing global stocks have pressured prices for some agricultural commodities, such as soybeans and cotton. In contrast, a reduction in global stocks of wheat and coarse grains since the late 1990s has strengthened prices for those grains. U.S. agricultural export value and market cash receipts to U.S. farmers have improved since the late 1990s when large global production and weak global demand pushed prices and trade down. Government payments to the sector, through marketing loan benefits and additional funds provided through emergency and disaster assistance legislation, have added to farm income during this period. However, lower farm income is projected over the next several years, largely due to a reduction in direct government payments from the high levels of the past several years, reflecting the baseline's assumption of no further ad hoc government assistance to the sector.

Longer run developments in the agricultural sector reflect strengthening domestic and international macroeconomic growth. While export competition and a strong U.S. dollar are projected to continue, improving world economic growth, particularly in developing countries, provides a foundation for gains in trade and U.S. agricultural exports. This results in rising market prices, increases in farm income, and improvement in the financial condition of the U.S. agricultural sector. Consumer food prices are projected to continue a long-term trend of rising less than the general inflation rate. The trend in consumer food expenditures towards a larger share for meals eaten away from home is expected to continue.

## **Macroeconomic Assumptions**

The outlook for the world economy assumed in the baseline is characterized by a significant U.S. and global economic slowdown through 2002, followed by a return to stronger growth for subsequent years. World real GDP growth in the baseline is at 1.6 percent for 2001 and 2.0 percent for 2002, compared with an annual average of 2.7 percent in the previous decade, before strengthening to over 3 percent a year in 2003-2011. These global economic growth assumptions mirror growth for the United States and reflect the increasing dependence of the world economy on the United States, the largest economy and the largest single market for foreign goods. The U.S. economy, therefore, is crucial for U.S. agricultural prospects through its role in spurring world growth, global agricultural demand and trade, and U.S. agricultural exports.

Most regions of the world are projected to register economic growth above long-term averages. A significant narrowing is projected in the differential between the high growth regions, such as Asia, and the lower growth regions of Latin America, Africa, and the transition economies, providing a broad base for global economic gains.

Importantly for agricultural demand, overall economic growth in developing countries rebounds to over 4 percent for most of the baseline. This pickup is important for global agricultural demand because many developing countries have incomes at levels where consumers diversify their diets to include more meats and other higher valued food products, and where consumption and imports of food and feed are particularly responsive to income changes. Projected growth in the transition economies (countries of the former Soviet Union and Central and Eastern Europe) of about 3.8 percent over 2003-2011 is significant in comparison to the economic contraction of the 1990s. Economic growth in developed countries is projected to rebound to 2.6 percent for the second half of the baseline, although relatively sluggish growth continues for Japan. U.S. growth reflects increases in the labor force and strong gains in productivity because of continued benefits from telecommunications- and information-related technology.

The U.S. dollar is projected to remain strong throughout the baseline, a negative factor for U.S. agricultural exports. Typically, a slowdown in the U.S. economy, as occurred in 2001, would be expected to result in a depreciation of the dollar. However, because the U.S. dollar is a reserve currency in so many countries and because of the critical role of the U.S. economy in the world, the global slowdown has resulted in continued inflows of capital to the United States as a safe haven, keeping the dollar strong. As U.S. and global economic activity rebound in the baseline,



the dollar stays strong as capital flows into the United States are attracted by relatively high financial returns.

Oil prices are assumed to decline in the initial years of the baseline from the high levels reached in 2000, reflecting reduced demand associated with the global economic slowdown. Moderate gains in oil prices at slightly more than the general inflation rate are then assumed from 2004 through the remainder of the baseline based on the assumption that new oil discoveries along with new technologies for both finding and extracting oil will allow for substantial growth in demand without significant energy inflation. Also, economic growth has become less directly dependent on energy as the economy has changed from producing goods to a process much more dependent on information and communication technologies, particularly in North America and Western Europe. While projected growth of real world oil prices should not notably hinder global GDP growth, the agricultural sector is more negatively affected by higher oil prices because of its relatively higher use of fuel and energy-based inputs such as fertilizer.

## **Crops**

Baseline projections for crops reflect an assumption of a continuation of current farm policy, primarily provisions from the 1996 Farm Act. Under an extension of current law, several major U.S. field crops continue to receive marketing loan benefits during the projection period. Soybeans receive these benefits in the early years of the baseline, and rice and cotton receive benefits for the entire period.

Slow global economic growth through 2002 and a strong U.S. dollar provide a weak backdrop for the agricultural sector early in the baseline. In the longer run, more favorable global economic growth supports increases in consumption, trade, and exports for most U.S. field crops, although gains in exports are constrained by a strong U.S. dollar and by continued strong trade competition.

Planted acreage for the eight major U.S. field crops (corn, sorghum, barley, oats, wheat, rice, upland cotton, and soybeans) rises to about 257 million acres by 2011, somewhat less than the recent high level of plantings of 260.5 million acres attained in 1996. Planting flexibility of current agricultural legislation facilitates acreage movements by allowing producers to respond to market prices and returns, augmented by marketing loan benefits in low price years. Marketing loan benefits influence the aggregate level of plantings as well as the cropping mix in the early years of the baseline when prices for some crops are relatively low. Projected acreage gains in the longer term reflect land drawn into production based on strengthening market incentives as world demand grows. Yield gains for many crops mitigate some of the need for increasing total land use. The baseline assumes that the amount of land enrolled in the Conservation Reserve Program will gradually build from 33.7 million acres in fiscal year 2001 to its maximum level authorized in the 1996 Farm Act of 36.4 million acres in 2005 and remain at that level for the rest of the projection period.

The domestic market is the main component of use for most major field crops. However, the export market is projected to increase in importance for several commodities. Gains in projected disappearance for wheat and sorghum are driven by exports, with U.S. trade showing larger

absolute increases and growth rates than domestic demand. After an initial decline, U.S. wheat exports rise steadily in the baseline, although continued competition holds the U.S. trade share below levels of the late 1990s. Sorghum export gains reflect increasing trade with Mexico. Exports of corn grow at faster rates than its domestic use, but absolute increases in domestic corn use are larger than trade gains, reflecting the relative size of these utilization categories. The corn sector faces strong competition in global trade from Argentina, muting U.S. corn export gains somewhat.

Projected consumption increases for soybeans, soybean oil, and soybean meal, rice, barley, and oats are driven mainly by domestic use. Growth in domestic consumption for these crops and crop products is larger than exports in both absolute and percentage terms. Exports of soybeans and products have larger gains in the initial years of the baseline as low market prices slow foreign production somewhat and encourage domestic crushing, with U.S. producers receiving marketing loan benefits. As prices strengthen, however, foreign production rises further, particularly in South America, and increased competition leads to smaller gains in U.S. soybean exports. U.S. rice exports remain strong in the early part of the baseline, a result of declining price differences over major competitors in the global market and abundant U.S. supplies, but exports decline in the second half of the projections as U.S. prices increase faster than world prices, making U.S. rice exports less competitive in some markets.

Domestic demand for many crops is projected to grow faster than population. Strong projected gains in corn used for ethanol reflect bans on MTBE in many States. Increases in domestic soybean crush continue to reflect growth in poultry production and demand for soybean meal throughout the baseline. Growth in domestic use of rice reflects a greater emphasis on dietary concerns and an increasing share of the U.S. population of Asian and Latin American descent. In contrast, gains in domestic food use of wheat in the baseline are generally consistent with population growth.

Cotton disappearance rises in the early years of the baseline as global consumption expands, but then declines through the end of the projections. Domestic mill use falls, in part due to the full phaseout of the Multi-Fiber Arrangement's textile and apparel import quotas scheduled for 2005. Cotton exports benefit from Step 2 payments and remain well above mill use. Nonetheless, after initially holding at 10 to 10.5 million bales, cotton exports decline for the rest of the projections due to strong foreign competition.

The ratios of ending stocks to use decline in the baseline for corn, wheat, soybeans, and rice, with nominal prices rising. The stocks-to-use ratio for cotton declines from recent high levels and becomes relatively stable towards the end of the projections.

## **Livestock**

Trends toward larger and more commercialized livestock and dairy systems continue throughout the baseline. Relatively low grain and soybean meal prices in the initial years of the projections encourage livestock sector expansion, although biological lags in the production process and poor forage conditions of recent years delay higher output for beef in the near term. In the longer run, moderate feed price increases through much of the baseline, replenishment of forage

supplies, low inflation, domestic demand increases, and gains in meat exports are expected to contribute to producer returns that encourage higher total red meat and poultry production. Although a growing proportion of production will be poultry, poultry production gains will slow due to maturity of the sector.

Beef cattle inventories have been held down by droughts and poor forage conditions over the past several years, which have encouraged more heifers to be placed in feedlots rather than retained for calving even as cattle returns have improved. The length of the biological lag is likely to prevent beef cow herd expansion before 2004-2005. The cattle herd rises from a cyclical low near 96 million head in 2003-2004 to about 104 million head by the end of the projections. Shifts toward a breeding herd of larger-framed, higher-grading cattle and heavy slaughter weights partially offset the need for further expansion of cattle inventories. The beef production mix continues to shift toward a larger proportion of higher-quality fed beef, with almost all steers and heifers being feedlot fed. Beef production also continues to move toward a higher graded product being directed toward the export and domestic hotel-restaurant markets. The United States remains the primary source of high quality, fed beef for export, largely to Pacific Rim nations. The United States becomes a net beef exporter near the end of the baseline.

The pork sector will continue to transform into a more vertically coordinated industry with a mix of production and marketing contracts. Increased vertical coordination in pork production will lower production costs and improve pork quality and product consistency, resulting in timely production of pork products with characteristics desired by domestic and foreign consumers. Larger, more efficient pork producers will market a greater percentage of the hogs over the next 10 years. The restructuring of the Canadian and U.S. pork sectors will continue the development of an integrated North American pork industry. With a more vertically coordinated industry structure, the hog cycle is dampened. Pork production rebounds in 2002 and 2003 with moderate expansion through the rest of the baseline. The United States is an important net pork exporter, in part reflecting land availability and environmental constraints in a number of competing countries that limit their production gains. Prospects for long-term growth markets for U.S. pork exports remain focused on Pacific Rim nations and Mexico. Canada will increasingly compete for trade in these markets.

Broiler production grows steadily throughout the baseline, but gains slow to only slightly more than population increases by the end of the projections due to the maturity of the sector. The broiler and turkey industries have kept production costs from increasing at the full rate of inflation through technological advances and improved production management practices, including taking advantage of economies of size through increasing horizontal and vertical integration. Although further technological improvements are expected to occur, efficiency gains are likely to be smaller than in the past. Processed products and fast food markets are important sources of domestic growth for the poultry sector. Competition in global poultry markets, where the focus is on low-valued products, holds U.S. poultry exports to moderate gains. Asian imports are projected to expand through the baseline, even with growing domestic broiler production in China. Exports to Mexico and Russia are also expected to increase.

Decreases in real prices of meats combined with increases in real disposable income allow U.S. consumers to purchase more total meat with a smaller proportion of disposable income. Small

declines in per capita consumption are projected for beef and pork, while increases continue in per capita consumption of relatively lower priced poultry. Thus, poultry gains a larger proportion of both total meat consumption and total meat expenditures.

Per capita consumption of eggs rises moderately in the baseline. Processed egg products become an increasing part of the egg market, in part due to fast food establishments expanding breakfast items which often incorporate egg products.

Milk production grows despite slowly declining cow numbers as strengthening milk-feed price ratios, improved management, and dairy productivity gains push milk output per cow higher. Productivity gains in the dairy sector will reflect the continued structural shift to larger-sized operations as many traditional dairy farms, particularly smaller operations, will experience income stress and will exit the industry. Domestic dairy demand is expected to show slow growth in the baseline.

### **Farm Income and Farm Financial Conditions**

Over the last several years, net farm income has been maintained at levels near the average of the 1990s mostly because of large marketing loan benefits and additional funds provided by emergency and disaster assistance legislation. With the baseline assuming no further ad hoc government assistance and with production flexibility contract payments scheduled to decline, farm income is initially lower as gains in commodity prices and cash receipts in the sector do not match the reduction in government payments and steady increases in production expenses. Despite some cash flow difficulties in the sector, a strong financial position achieved during the 1990s will help farmers through this period.

In the longer run, the outlook for the sector improves as agricultural demand and exports strengthen and prices rise, leading to gains in farm income and greater stability in aggregate financial conditions. After holding relatively flat in 2002 through 2005, net farm income gradually moves upward for the rest of the baseline to more than \$57 billion by the end of the projections. As direct government payments fall and then level off, the agriculture sector increasingly relies on the marketplace for its income. Government payments, which represented nearly 10 percent of gross cash income in 2000, account for only about 2.5 percent of gross cash income in the latter part of the projections. Both crop and livestock receipts are up in nominal terms due to larger production and higher prices. Production expenses increase in the baseline, with expenses for non-farm origin inputs rising faster than expenses for farm-origin inputs. Cash operating margins tighten somewhat early in the projections, with cash expenses increasing from 75 percent of gross cash income in 1998-2001 to 78-79 percent over the next several years, before falling back to 76 percent later in the baseline.

With reduced farm income and cash flow over the next few years, debt management will be crucial to the financial condition of the agricultural sector, as farm asset values will rise only moderately in the near term. Lenders will factor farmers' reduced cash flows available for debt repayment into more restrained lending decisions, and farmers will be less willing to undertake credit-financed expansion. In the longer run, increasing farm incomes and relatively low interest rates assist in asset accumulation and debt management, thus leading to improvement in the

financial condition of the farm sector. Farm asset values strengthen in response to improving farm income prospects. Farm debt rises as well, but at a slower rate than asset values. Thus, the debt-to-asset ratio for the sector declines after 2003, falling to about 15 percent at the end of the baseline, which compares to the high levels of over 20 percent in the mid-1980s.

### **Food Prices and Expenditures**

Retail food prices in the baseline are projected to rise less than the general inflation rate, continuing a long-term trend. The largest price increases generally occur among the more highly processed foods, such as cereals and bakery products. Retail prices of these foods are related more to the costs of processing and marketing than to the costs of farm commodities. Expenditures for meals eaten away from home account for a growing share of food spending, reaching nearly 50 percent of total food spending by the end of the baseline.

### **Agricultural Trade**

Global trade and U.S. agricultural exports are projected to grow during the next 10 years as stronger U.S. and international economic growth starting in 2003 leads to improving long-run demand prospects and as continued progress is made toward freer trade.

Projected growth in global wheat and coarse grains trade is particularly strong compared with recent performance, and cotton trade is projected to improve from the contraction of the 1990s. The expansion of grain, soybean, and soybean product trade is broad based, driven by rising incomes in developing regions, diet diversification, and increased demand for livestock products and feeds. The phase out of the Multi-Fiber Arrangement by 2005 is expected to boost demand for raw cotton in developing countries, while gradually shifting demand in developed countries from raw cotton to processed cotton products (textiles and apparel).

Global trade in soybeans and products is projected to continue growing, but at a slower rate than the rapid growth of the 1990s. Continued strong gains in developing-country demand for feed protein is projected to be partly offset by reduced demand in the EU that results from slowed livestock output and increased substitution of grain for protein feeds following Agenda 2000 reforms. Growth in soybean oil trade is projected to be slower than the very high rate achieved in the 1990s, due to increased crushing in developing countries and competition from other oils, particularly palm oil.

U.S. export volume is projected to increase for wheat, coarse grains, soybeans, and soybean products, but decline for rice and cotton. For wheat, continued competition holds the U.S. trade share below levels of the late 1990s. For coarse grains and soybean and soybean products, U.S. exports expand more slowly than world trade, due in part to strong competition in these markets. U.S. cotton export volumes remain strong through the baseline, but decline gradually in the second half of the decade due to tighter U.S. exportable supplies and rising foreign production. U.S. rice exports are expected to fall over the baseline period as domestic demand outpaces U.S. production. U.S. exports of soybeans and products grow at a slower rate than in the 1990s, reflecting projected smaller growth in world trade and increasing competition from Argentina and Brazil.

Global meat trade and U.S. meat exports are projected to grow only moderately in the near term, partly a result of the slowdown in world economic growth. All meats benefit from a strengthening of global economic growth after 2002. Japan, Mexico, and Russia show large increases in meat imports over the projection period.

The total value of U.S. agricultural exports is projected to rise to \$77 billion by fiscal year 2011, up from about \$53 billion in 2001. Both bulk and high-valued products are expected to show strong export growth. High-valued products continue to account for about two-thirds of total U.S. exports, by value. The growth expected in bulk-export value lends strength to total export earnings, in contrast to the average annual decline in bulk commodity export value in the 1990s. U.S. agricultural imports are forecast to grow from \$39 billion in fiscal year 2001 to \$52.5 billion in 2011, reflecting the expansion of the domestic economy and the dollar's exchange value. The resulting agricultural trade surplus rises to \$24.2 billion in fiscal year 2011, up from \$13.9 billion in 2001 but still well below the record export surplus of 1996.

## **Macroeconomic Assumptions**

Macroeconomic projections underlying the USDA baseline were completed in October 2001. The projections are characterized by a significant U.S. and global slowdown in the short term, followed by a return to sustained growth at historical levels. The transition economies and Africa continue to generate significant positive growth in GDP which, if sustained, will result in substantial increases in per capita income. Although this is a significant improvement for these countries, the global outlook will only be affected marginally since they are such a small part of the global economy.

During the last decade (1991-2000), the U.S. and world economies became increasingly interdependent. Trade expanded and trade increased as a share of income in most countries of the world. This was most pronounced during 1996-2000. The U.S. economy grew faster than the rest of the world during every year from 1996 to 2000, and faster than any other major developed economy, except Canada. The domestic economy absorbed large trade deficits in raw materials and manufactured products during this period. Rising foreign portfolio and direct real investment in the United States, a trade surplus in farm products, and exports of specialized capital equipment and software financed the trade deficit in consumer goods (such as automobiles) and raw materials (such as oil). The NAFTA resulted in a dramatic rise in food exports to Mexico and Canada, even as the more efficient U.S. food processing industry built factories in Mexico and Canada.

U.S. manufactured exports grew rapidly in the 1996-2000 period, stimulating strong growth in rural employment and providing increased off-farm employment to farm households. The expanded trade volume, coupled with strong growth in the U.S. information and telecommunications sectors, boosted overall productivity growth. The stellar growth in productivity was accompanied by the addition of more than 23.5 million jobs to the U.S. economy. As a result, economic growth in the United States was faster than in the rest of the world for more than five years in a row, despite never having grown faster than the rest of the world for more than 3 years in a row any time in 1960-1990.

During the 1990s, and especially in 1996-2000, U.S. stock market prices had the most rapid growth since the 1920s. The five-year annualized rate of appreciation in the stock market in 1995-1999 was 21.2 percent, an appreciation rate last seen in the five years ending in 1929. The domestic economic and equity market growth was so robust that the 1997-1998 world financial crisis hardly mattered to most of the U.S. economy. The perception of the invulnerability of the U.S. economy on Main Street and Wall Street resulted in a strong U.S. dollar through the second half of the 1990s. The world economy's quick recovery from the 1997-1998 crisis was in large part dependent on the robust U.S. economy.

The global financial crisis that took place in 1997-98 changed trade policies, trade patterns, and interest rates, and led to a major exchange rate realignment, including an appreciation of the U.S. dollar. The U.S. dollar is a reserve currency in many countries. Further, because of the critical role of the U.S. economy and capital markets in the world, the global slowdown of 2001 has resulted in continued inflows of capital into the United States and thus a continued strong dollar. Beginning in 1998 and continuing through 2001, currencies of our agricultural competitors

## Exchange Rates and Agricultural Baseline Projections

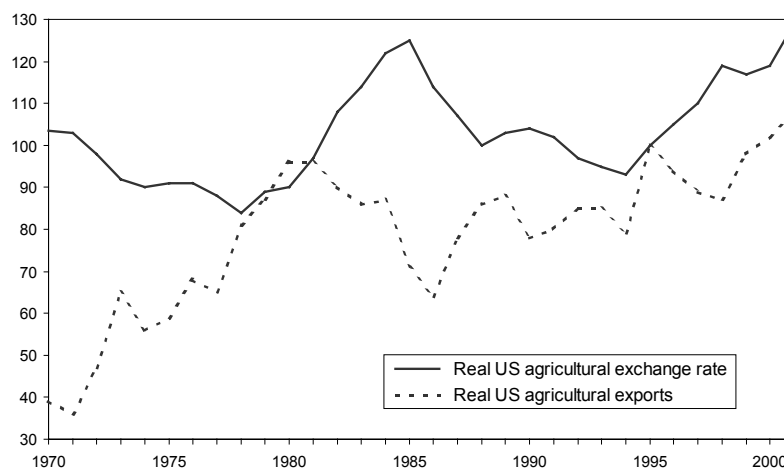
Exchange rate changes are a major factor in explaining the long-term outlook for U.S. agricultural trade. A high value of the U.S. dollar tends to erode U.S. agricultural competitiveness and result in periods of relatively low exports, while periods of low U.S. exchange rates tend to be associated with relatively high export performance (fig. 1). For instance, the peak export performance in both 1980 and 1995 followed low points in the U.S. agricultural exchange rate, while the low point in agricultural exports in 1986 followed the high exchange rate of 1985.

Currently, the dollar is stronger than at any time since the early 1980s. The international financial crisis of 1997-98 resulted in large currency devaluations in some major agricultural markets. The current economic slowdown in the United States and much of the world is leading

Figure 1

### U.S. agricultural exports are sensitive to changes in exchange rates

Index (1995=100)



Source: USDA, ERS

Note: 2001 estimated based on partial year data.

--continued

depreciated relative to the dollar more than did currencies in our major export markets. The overall impact was U.S. agricultural exports below levels that otherwise would have been realized. Baseline assumptions do not anticipate any significant change in relative exchange rates, a continued negative factor for U.S. agricultural exports. In the intermediate to longer term, sustained increases in worldwide economic growth should be a positive factor for import demand for agricultural products.



## Exchange Rates and Agricultural Baseline Projections--continued

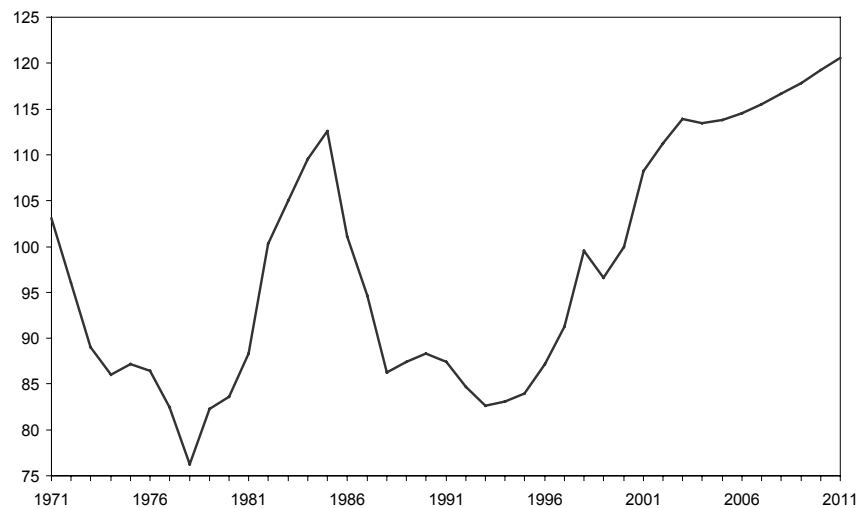
to further appreciation of the dollar. In uncertain economic times, money flows into the United States as a safe haven, pushing the dollar up. This pressure on the dollar has been particularly strong over the last several years and has led to a forecast for a strengthening U.S. dollar in the baseline (fig. 2).

A strong dollar is anticipated to persist through the projections period, constraining growth in U.S. agricultural exports. Bulk commodity and horticultural exports tend to be more sensitive to exchange rate changes compared with high value processed products.

Figure 2

### U.S. agricultural trade-weighted exchange rate\*

Index of foreign currencies per U.S. dollar (2000=100)



\*Weights based on baseline countries from Table 2.

## Domestic Macroeconomic Projections

U.S. economic conditions are vital to U.S. agricultural prospects, despite a very low income-elasticity of domestic demand for most farm products. U.S. GDP growth spurs world growth since the United States is the largest single market for foreign goods as well as the largest economy. The dependence of the world on U.S. growth has increased in the last ten years. U.S. capital markets are the most important in the world. A reflection of the dominance of U.S. capital markets is that German stock market prices have moved in line with the U.S. stock market during the last decade.

The growth of developing economies and the relative strength of the dollar strongly influence farm export demand and prices. Further, U.S. inflation, energy prices, and interest rates directly influence U.S. agricultural production costs as well as indirectly influence agricultural competitors' costs.

### **Review of 1991-2000: Productivity Growth Reborn**

Annual productivity growth in 1970-1990 was far below that in the previous two decades. In the early 1990s, most analysts expected the slower productivity growth of the 1970-1990 period to continue for the 1990s. However, productivity growth increased during 1991-2000, setting the stage for the long-term baseline projection.

In many ways the U.S. economic performance in 1991-2000 was reminiscent of the 1960s. The decline in real defense spending following the end of the Cold War and low commodity price inflation provided a strong supply underpinning for the economy. As a result, monetary policy was accommodating without major inflationary consequences, so short-term interest rates were low. Toward the end of the decade, the Federal budget moved into strong surplus, due to policy changes in the late 1980s and early 1990s, the decline in real defense spending, fast GDP growth, and low inflation. The decline in the U.S. public debt-to-GDP ratio during the decade made more funds available for private sector investment. Of the G-7 countries, only Canada had a smaller public debt-to-GDP ratio as of 2000.

The most dramatic indicator setting this decade apart was the stock market, which appreciated at an annual rate of 14.2 percent, the highest growth since the 1920s. Monetary policy brought the economy out of recession in 1991, despite tight fiscal policy, and helped keep inflation in check. Low inflation, superior productivity growth, and sound long-term fiscal policy kept the U.S. economy out of recession for 10 years.

A significant portion of the decade's prosperity can be attributed to the "new" economy. The "new" economy is the effect on overall economic productivity and growth of technological innovation in telecommunications and information management reflected in the growth of the Internet. While there were excesses, such as the rapid run up of prices of NASDAQ technology stocks that had no earnings or prospect of earnings in the foreseeable future, the five-year boom in computer-based equipment investment in the late 1990s resulted in a revolutionary change in basic business practices, in which the use of software, the Internet, and telecommunications technology lowered business transaction costs associated with inventory control and input purchases.

The rapid investment growth of the 1990s gave rise to extraordinary productivity gains which, while concentrated in technology-related sectors, had enormous impact on the cost structure of the American economy from manufacturing to services to Government. The high-tech revolution relied on new software and hardware. The result was large productivity-enhancing changes in business practices, saving labor and material costs and rapid capital cost recovery.

Structural changes created a tremendous environment for productivity growth. In the 1990s, dramatic U.S. management practice improvements, just-in-time inventory control, managed

healthcare, weak world commodity market inflation, and the Internet provided the backdrop for productivity improvement. Most analysts attributed an important role to the Internet as an every day tool of the information age.

The U.S. labor market became more flexible due in part to improved information technology. Deregulation in transportation and telecommunications and increasingly free trade and increased domestic industrial competitiveness provided an economic environment for technological change to be reflected in rising labor productivity.

The extraordinary productivity growth in the 1990s was faster than in any other ten-year period since the 1960s. The downturn in productivity growth in the 1970-1990 period was worldwide among developed countries, afflicting Japan, Europe, and Canada, as well as the United States. The upturn seen in 1991-2000 was largely limited to the United States and Canada, with only a modest rise in productivity in Europe. With sluggish growth in Japan and only modest growth in Europe, the United States again became the growth locomotive of the world, as in the early 1980s.

Both wages and profits grew more rapidly in the 1990s than they had in the 1970s and 1980s. In 1997, the ten-year average growth in real compensation had dropped to a post World War II low, despite a rapidly falling unemployment rate. One of the biggest questions in labor economics is why real compensation growth remained low for so long into a vigorous economic expansion. Yet by 2000, the ten-year average growth in real compensation rose to a rate not seen since 1979, reflecting a substantial rise in real compensation financed by rising labor force productivity. Real corporate profits in 1990-2000 had an average growth rate of 4.9 percent per year, well above the average of 2.6 percent per year in the previous decade.

### **Short-run Downturn Reflects Imbalances**

The longest economic expansion in U.S. history ended in 2001 as the U.S. economy went into a recession. The events triggering the recession started in 2000. The crash of the NASDAQ from a peak in March of 2000 precipitated a broad scale stock market decline later in 2000 and 2001. Investors had come to realize that for a large number of companies, implied earnings growth would not and could not ever materialize. The world and domestic manufacturing sectors faced declining demand growth, as the technology-related business and consumer goods spending surge collapsed in late 2000, at the same time that global production capacity rapidly expanded. The 1995-2000 double-digit equipment investment growth collapsed in 2001, as the over-expansion in computer and telecommunications equipment resulted in large excess overall telecommunications capacity. Further, energy prices surged, cutting into the consumer and business budgets for non-energy goods and services. Only extraordinary consumer spending growth, in excess of growth in disposable income, prevented a recession in 2000.

Financial intermediaries and markets, seeing the weakness in manufacturing, tightened credit conditions. The tightening was reflected in more restrictive lending standards and higher spreads between corporate and U.S. Treasury bonds. The aggressive easing of monetary policy beginning in December 2000 could not overcome the overall tightness of the credit markets and weak stock market. The rest of the world slowed partly due to declining U.S. import demand,

despite a strong dollar. Slower world growth slowed U.S. export demand. A combination of a slide in investment spending, slightly weaker consumer spending growth, and sluggish exports brought a drop in GDP in the third quarter of 2001.

### **Near-term U.S. Macroeconomic Outlook**

In 2001, the unemployment rate is expected to average almost 5 percent for the year, up sharply from the 4.0 percent of 2000. In 2001, GDP growth is estimated to be 1.2 percent, the lowest rate since 1991.

Bottlenecks in specific labor markets have eased, greatly lowering the chance of re-igniting higher inflation. The baseline assumes short-term interest rates will continue to be low in 2002 to help stimulate growth. The expected sluggish world growth, lower oil prices, and lower inflation will lead to lower long-term interest rates.

Most industry analysts expect auto demand growth to slow from the rapid pace of recent years as record per capita levels of car ownership have been reached. The saturation in auto demand will make it harder for low interest rates, low oil prices, and the continued fiscal stimulus to boost consumer spending enough to get positive GDP growth overall until well into 2002.

Moreover, the surge in car sales at the end of 2001, due to manufacturers' subsidized 0-percent interest rate car loans, will likely be followed by diminished car sales in early 2002. But low energy prices, the 2001 tax cut, government spending increases, and the lagged impact of easy monetary policy on other consumer durable spending and construction will boost consumer and business spending enough to bring the economy out of recession by the second quarter of 2002. So growth just above 1 percent is expected in 2002. Nevertheless, stronger U.S. economic growth expected in the second half of 2002 will boost the world economy in 2003.

Nothing in the short-term outlook gives any reason to expect poor long-term prospects for the domestic economy. While the very strong economic conditions of the last part of the 1990s could return, a more moderate average growth similar to that of the 1990s as a whole is more likely beyond 2002. Long-term world economic prospects are supported by this U.S. growth outlook.

### **The U.S. Economy: 2003 to 2011 Projections Overview**

Longer-term macroeconomic projections are based on trend GDP growth assumptions for 2004-2011, with 2003 used as a transition year from the short-term forecasts. U.S. GDP growth in 2002 is forecasted at 1.4 percent, but growth returns to a long-term sustainable rate of 3.2 percent per year in 2003 through 2007, slowing to 3.1 percent per year in 2008 to 2011 as baby boomers retire in large numbers.

**Oil Prices to Rise Modestly.** Current oil prices reflect weak global economic growth for 2001 and 2002. Crude oil inventories are assumed in the baseline to be restored to normal levels by 2004. Then, with renewed world economic activity, oil demand growth will have a modest upward impact on prices for the remainder of the baseline.

**Financial Markets in 2004-2011 Similar to 1997.** Projected financial market variables such as interest rates reflect a balance of supply and demand for loanable funds consistent with world and U.S. growth assumptions. Moody's AAA bond rates are assumed to average 7.4 percent in 2004-2011. Core inflation in the CPI is projected to be 2.6 percent. An unemployment rate of 4.9 percent is assumed, reflecting effective full employment. Projected real labor compensation grows about 1 percent annually, reflecting the historical labor share of productivity growth.

### **Underlying Policy and Aggregate Supply Assumptions for 2004-2011**

- Fiscal policy results in small structural Federal budget surpluses.
- Monetary policy will be relatively stringent, as the Federal Reserve will tighten when significant inflationary pressures return, keeping GDP deflator inflation at 2.5 percent. The three-month Treasury bill yield, reflecting Fed policy, is assumed to average 4.3 percent, consistent with relatively low inflation.
- Trend labor productivity growth will average from 1.9 to 2.2 percent between 2002 and 2011.
- Starting in 2004, real crude oil prices rise 0.3 percent per year, roughly consistent with the Energy Information Administration's January 2001 *Annual Long Term Outlook* and the more recent long-term projections of the International Energy Agency.
- Employment growth is expected to average 1.1 to 1.2 percent a year through 2011, which is broadly consistent with Bureau of Labor Statistics projections. This projection is consistent with the tightened welfare and disability qualifications now in place, expected immigration, the age structure of the working population, and continuing retirement prior to social security eligibility.

World GDP growth is expected to be about 3.3 percent from 2006 to 2011. Since the U.S. is about 25 percent of the world economy, world growth and U.S. GDP growth are interdependent.

### **Domestic Macroeconomic Projection Highlights**

- The trend baseline assumptions avoid introducing macroeconomic-related cycles into the agricultural sector projections. These trend assumptions are consistent with standard macroeconomic relationships, such as an increasing capital-to-labor ratio and high total factor productivity raising labor productivity.
- Long-term trend GDP growth is projected at 3.2 percent. Disposable income and consumer spending are expected to grow at a trend rate of 2.9 percent per year. Disposable income gains will be partly the result of growth in real compensation in a labor market that has the unemployment rate at 4.9 percent. A pickup in the personal savings rate relative to the low savings rates of 2000 and 2001 is expected. Negative personal savings rates are not

sustainable in the medium term and are not expected to continue even as GDP growth picks up in 2003.

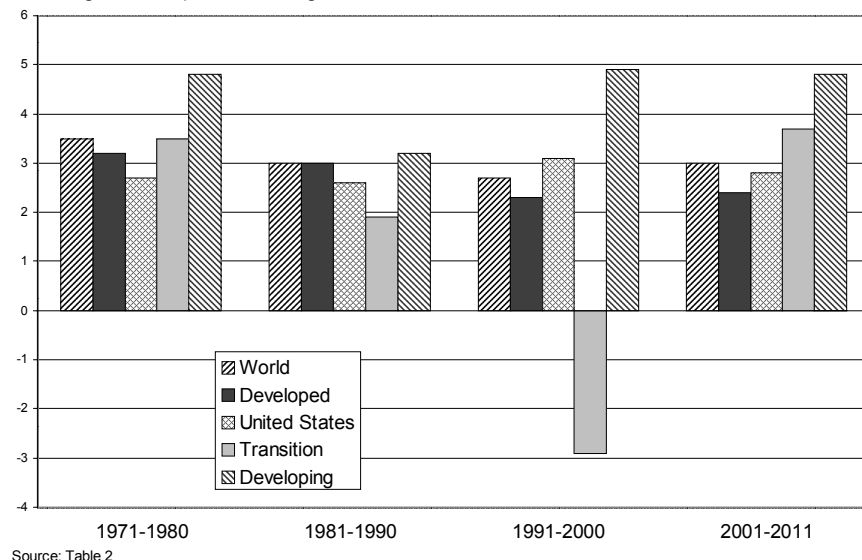
- The financial investment required to achieve continued high productivity growth implies augmenting domestic savings with a net inflow of foreign funds. This will result in continued trade deficits and will prevent a significant drop in real long-term interest rates despite modest budget surpluses and modest increases in the personal savings rate. A continuing trade deficit and accompanying inflow of funds is consistent with a strong real value of the dollar in the long term. While likely to shrink from recent high levels, the trade deficit will continue to be substantial.
- The dollar is expected to continue to be strong. Japan's growth is expected to continue to be weak. The EU, especially in the near-term, will show less robust growth than the United States. The dollar will stay strong despite large trade deficits, as capital flows into the United States are attracted by relatively high financial returns.
- Inflation as measured by the annual GDP deflator is projected to average 2.5 percent from 2004 to 2011, almost as low as that in the early 1960s. The sharp fall in oil prices seen recently is expected to pick up in late 2002, with the average price still below 2001's average. The market is assumed to stabilize in 2004 consistent with trend projections for the other macroeconomic variables. The trend growth in oil prices thereafter is expected to result in average real crude oil prices comparable to those of 1996 by the end of the projection horizon.

### **International Macroeconomic Assumptions**

The outlook for the world economy over the next 10 years is characterized by a short-term slowdown followed by a resumption of sustained growth without major imbalances across countries. Although long-run growth rates in the Asian crisis countries are lower than they were before the crisis, significantly high real GDP growth rates of about 5 percent per year are forecast for these countries. Significant sustained positive growth is forecast for Africa and for Russia, continuing the pattern that began in 2000. In both cases, positive per capita income growth is foreseen, reversing income declines of the 1990s. Although positive GDP growth resumes in Japan in 2003, the outlook for continued sluggish growth there is an important negative feature of the longer-term global outlook.

There are two distinct phases of the world economic forecast. In the near to midterm, the slowdown and recovery dominates the outcome. In the longer-term, the spreading impact of new technology leads to renewed sustained economic growth in a broad band of countries around the world. There is a convergence of growth rates with lower (but still high) growth in Asia and higher growth in Africa and Latin America. Growth in the decade 2002-2011 will mirror the pattern of the 1970s (fig. 3). Given the underlying increase in productivity growth both in the United States and abroad, the outlook is for sustained high growth without significant inflationary pressures.

Figure 3  
**World GDP growth rates, decade averages**  
 Average annual percent change



World real GDP is projected to grow an average of 2.7 percent between 2001 and 2005, the same rate as during 1991-2000 (table 2), before increasing to 3.3 percent between 2006 and 2011. The EU countries begin to benefit from their monetary union. Although unemployment in the EU is still high compared with the United States and Japan, it is likely to fall consistently below 10 percent over the projections period. Prospects for Europe are better than they have been for a long time. Rigidities still remain and average growth in the European Union is likely to be almost 1 percent below that in the United States.

The crisis countries of Asia recovered much more rapidly than at first anticipated. However, the structural reforms that would provide the fundamentals for long-term sustained high-level growth still need to be implemented, particularly in banking. These structural problems and the overall high dependence on trade with the United States has made them vulnerable to the current U.S. slowdown. Consequently, projected growth for these countries is not as high as before the crisis. Growth for the next decade of 6 percent is projected to be somewhat slower in East and Southeast Asia than the 7.3 percent annual rate of the 1990s. Nonetheless, the countries of the region, particularly China, are still going to be among the highest growth countries in the world.

Latin American growth is projected to increase to an average of 3.6 percent between 2002 and 2011. However, the 4.3 percent projected growth in 2006-2011 is significantly higher than the 3.3 percent growth of the 1990s. Africa and the transition economies of Eastern Europe and the former Soviet Union are projected to experience even higher growth relative to the historical period. For Africa, growth is projected to increase from 2.6 to 4.2 percent. The transition economies are projected to experience growth of 3.7 percent compared with an economic contraction in the 1990s at a rate of 2.9 percent per year. In both cases, significant per capita income growth is expected.

### **U.S. Food Sector Prosperity Tied to Global Consumers**

The world's population, estimated at 6.2 billion people in 2001, is expected to increase by another 737 million persons by 2011, almost all of which will be in developing countries. During the 1990s, inflation-adjusted global per capita GDP grew by about 1.3 percent, with developing countries registering higher growth (3.3 percent). Increased purchasing power, accompanied by faster rates of population growth, has led to greater demand for food by consumers in developing countries. This pattern is expected to strengthen during the projection period as world GDP per capita grows about 2 percent per year, but developing country per capita GDP increases by 3.5 percent annually.

At low income levels, consumer demand for food is driven by the need to meet an individual's basic caloric requirement, leading to a diet mainly comprised of carbohydrate-rich products such as cereals, roots and tubers. At higher income levels, when consumers can readily meet their caloric needs, the demand for food is often shaped by taste, cultural trends, and other social factors such as an increasing number of women working outside their homes. Middle-income countries such as Thailand and Mexico fall into this category. Income growth among consumers in these countries usually leads to substitution away from staple foods and towards more expensive sources of calories such as meat and fruit and vegetables, and processed products popularized by cultures in developed countries.

Urbanization has been particularly important in changing food consumption patterns in developing countries. In general, urbanization is associated with sharp increases in the diversity of calorie sources in diets. In 1960, developing countries accounted for slightly over half of the global urban population. By 1998, these countries accounted for about three-fourths of the world's 3 billion urban dwellers. Assuming the growth rates of the 1990s continue, the urban population in developing countries is expected to double to nearly 4 billion by 2020. The effect of this urbanization will lead to further changes in food consumption patterns in developing countries, with the demand for meat and other higher value food products increasing.

**--continued**

The developed economies are projected to grow an average of 2.4 percent annually, a rate comparable with that of the 1991-2000 period. Inflation is expected to continue at low levels in both the developed and developing countries.

Overall, projected world growth between 2001 and 2011 is stronger than in any period since the 1960s and 1970s, with most regions of the world expected to have growth above long-term averages. The narrowing of the differential between the high growth regions such as Asia and the lower growth regions of Latin America, Africa, and the transition economies implies a broader base to economic growth worldwide.



### **U.S. Food Sector Prosperity Tied to Global Consumers--continued**

Data in the accompanying table for the marginal propensity to consume food indicate that for every dollar increase in income, consumers in low-income countries spend a relatively large amount on additional food purchases (about 54 cents in Tanzania, for example), while consumers in high-income countries like Japan and the United States spend less than 10 cents on food. Similarly, the income elasticity for food expenditures—another measure of the responsiveness of food purchases to a change in income—is also higher for poorer countries. For either measure, when income rises in both low- and high-income countries, poorer countries increase their expenditures on food by a relatively larger amount than wealthier countries do.

Furthermore, when incomes rise, expenditures on higher value products such as meat typically increase relatively more than expenditures on cheaper products such as cereals (Regmi *et al.*, 2001). As a result, meat expenditures increase as a share of total food expenditures, a phenomenon that persists in nearly all countries. For example, for a 1-percent increase in income, consumers in Tanzania increase their spending on food by 0.80 percent, but increase their expenditures on meat by 0.86 percent. For Mexico, the expenditure rate changes are 0.59 percent for food and 0.63 percent for meat. These compare with the United States where a 1-percent increase in income is associated with only a 0.12-percent increase in food expenditures and a 0.13-percent rise in meat expenditures.

Based on expected population and income growth, developing countries will account for most of the increase in global food demand over the next couple of decades. Yet, food availability in developing countries (although increasing), remains far below that of developed countries. For example, in 1999, only about 2,200 calories were available per person in Bangladesh, while food availability in the United States was about 3,700 calories per person (FAOSTAT, 2001).

Although domestic production may expand to meet part of the growing food demand, it is likely that food production in many developing countries will be constrained by limited resources. Unless agricultural productivity accelerates, it is likely that developing countries will have to rely on imports to satisfy part of their growing food needs. Agricultural exporters with the potential to expand production, such as the United States, are likely to reap the benefits.

**--continued**

Oil prices are assumed to decline in 2001-2003 from the high levels reached in 2000, and then to rise slightly more than the general inflation rate for the remainder of the baseline. This near-term decline in oil prices followed by moderate gains is predicated on the assumptions that new oil discoveries, such as those in Kazakhstan, along with new technologies for both finding and extracting oil, will allow for substantial growth in demand without significant energy inflation. Also, economic growth itself has changed from a process of producing goods to a process much more dependent on information and communication technologies. This transformation, which is particularly evident in North America and Western Europe, has reduced the direct growth dependence on energy and is expected to have widespread impacts throughout the world.

### U.S. Food Sector Prosperity Tied to Global Consumers--continued

Poorer countries spend more of additional income on food, with a greater share spent for meat

Country	Marginal propensity to consume food <sup>1</sup>	Income elasticity for food <sup>2</sup>	Income elasticity for meat <sup>3</sup>
	<i>Cents</i>		<i>Percent</i>
Tanzania	54	0.80	0.86
Vietnam	39	0.74	0.80
Bangladesh	38	0.74	0.79
Pakistan	35	0.72	0.78
Indonesia	31	0.70	0.74
Philippines	27	0.67	0.71
Thailand	26	0.66	0.71
Ukraine	26	0.66	0.70
Morocco	25	0.65	0.69
Egypt	25	0.65	0.69
Brazil	22	0.62	0.66
Iran	21	0.61	0.66
Turkey	21	0.61	0.65
Mexico	20	0.59	0.63
Poland	19	0.58	0.62
Tunisia	18	0.57	0.60
Hungary	16	0.54	0.58
Argentina	15	0.52	0.55
South Korea	13	0.48	0.51
Greece	11	0.45	0.48
France	7	0.34	0.36
Australia	6	0.30	0.32
Japan	6	0.29	0.31
Canada	5	0.28	0.29
United States	2	0.12	0.13

1/ Amount spent on food from an additional dollar of income.

2/ Percentage change in food expenditures resulting from a 1-percent increase in income.

3/ Percentage change in meat expenditures resulting from a 1-percent increase in income.

Source: ERS calculations based on 1996 International Comparison Project data, World Bank.

### References

Regmi, Anita, M.S. Deepak, James L. Seale, Jr., and Jason Bernstein, "Cross-Country Analysis of Food Consumption Patterns," Chapter 2 in *Changing Structure of Global Food Consumption and Trade*, WRS-01-1, ERS-USDA, May 2001.

FAOSTAT, Food and Agriculture Organization, United Nations, 2001.

## **Developed Economies**

In the coming decade, real GDP growth in the developed economies will increase from the relatively low rates at the beginning of the decade. The structural adjustments undertaken throughout the second part of the 1980s and into the 1990s combined with increasing underlying productivity growth from the new technology revolution provide a solid foundation for long-term growth. Low inflation and interest rates will help countries produce output close to potential levels. Government budgets, except in Japan, will be largely balanced. However, external imbalances may persist, particularly the large U.S. trade deficits with Japan and China. Among the major economies, only the United States will continue to carry a large current account deficit, although it is expected to decline somewhat over the projections period. The continued large trade deficits for the United States are predicated on the assumption that countries around the world will still want to accumulate dollars as a reserve currency. If the euro begins to challenge the dollar's role as an alternative reserve currency, then a significant relative depreciation of the dollar would be expected and the competitive outlook for U.S. trade would improve.

**European Union.** Monetary union between qualified EU members and introduction of a single currency enhances the efficiency of cross-border trade and investment within the EU. More uniform fiscal policies, as well as disciplined monetary policy guided by the German-based European Central Bank, should lead to more stable growth prospects in the baseline. The European economy is projected to expand by 2.2 percent on average between 2001 and 2005 and 2.4 percent from 2005 to 2011. Population will stabilize so that virtually all income growth will translate into per capita gains.

Unemployment will remain high relative to the United States, but should gradually fall from near 10 percent to 8 percent as more flexible wage and employment policies are adopted. This is a significant change from the very persistent double-digit unemployment rate over the 1990s. Inflation should be well controlled as a strong unified currency, the euro, acts as an anchor for price stability. Fiscal consolidation by member countries will reduce inflationary expectations and lower long-term interest rates. The euro is projected to appreciate in real terms over the next several years, and then depreciate slowly for the rest of the projections period. Because of the monetary union, national differences in real interest rates will disappear, at least for the countries in the union--financial markets will encompass the whole region, and thus investment opportunities will be less dependent on the relative availability of capital in each country.

Greater intra-European trade should encourage price arbitrage of homogeneous products and services, providing comparable prices across countries for both producers and consumers. As capital moves freely across borders, investors and producers would be able to compete on more equal terms across countries, despite the lack of transnational mobility of workers. Even without formal eastward enlargement, closer integration with Eastern Europe also opens more trade and investment opportunities in the transition economies, particularly the countries of the former Soviet Union. As the transition economies gain higher per capita incomes, imports from the EU should rise accordingly.

**Japan.** Japan's economy continues to face significant structural problems, including a large fiscal deficit, sluggish consumer spending, and very large non-performing loans that burden the

banking system. The country has been in a recession that is expected to last well into 2002 in spite of nearly zero interest rates and substantial government deficit spending, particularly on public works projects. The government hopes to induce self-sustaining economic growth by restoring consumer confidence and reviving financial activity and investments by addressing private-sector debt problems. Projected slow growth after 2002 assumes some success in these efforts, but also reflects the difficulty of the task. Added to the current economic difficulties is the anticipated decline in size of the labor force in the last part of the projection period, which could lead to lower output unless labor productivity improves. Japan's share of world GDP is projected to decline from a peak of almost 13 percent in 1991 to about 9.25 percent by 2011.

A major issue for Japan's economy is the excess of savings over investment, as manifested in its sizable current account surplus. This fundamental imbalance, together with non-tariff barriers that restrict imports and foreign investment, keeps the domestic economy isolated from global competition. High internal costs in the non-manufacturing industries, such as farming, housing, and electric power generation, have held back investors as well as consumers. More deregulation will encourage domestic demand, specifically private consumption and investment, as well as boost imports.

The yen is expected to depreciate in real terms over the next several years, reflecting the relative weakness in the economy, and then stabilize. Japan's domestic interest rates will remain among the lowest in the world. Opening Japan's retail and insurance markets to foreign competition will lower prices of goods and services, continuing the pattern of very low inflation or even deflation.

**Canada.** Canada's economic growth pattern in the 1990s roughly tracked that of the United States. Because of the close integration of trade and investment, projections over the next 10 years have Canada growing at about the same rate as the United States. NAFTA has reinforced the integration of the two economies. In the 1990s, Canada consistently had a trade surplus with the United States, the destination for 82 percent of its exports. A competitive Canadian dollar significantly influenced this pattern. A steady depreciation against the U.S. dollar since 1990, averaging 3.9 percent a year, has helped boost the Canadian currency's real exchange rate competitiveness. The baseline assumes a continuation of the depreciation of the Canadian dollar.

The future growth path for Canada depends to a large extent on the pace of U.S. economic activity, augmented by growing trade with Asia and Mexico. Already considerable, Canadian trade with Asia should expand further. Canadian trade with Mexico has been stimulated by NAFTA. The country's trade surplus is projected to continue growing.

The overhaul of Canada's fiscal policy from large deficit to surplus is principally responsible for the country's bright growth prospects. Less government spending and more funds available for private investment and consumption allowed market forces to revive previously anemic growth as interest rates fell significantly. Low inflation and interest rates are expected to carry healthy GDP expansion through the next decade. Also, foreign debt as a percentage of GDP will fall over the next 10 years. Domestic demand in the short- and long-term will be led by fixed capital formation. Gross national savings as a share of GDP will increase.

## **Transition Economies**

Among the transition economies, countries that are further along in the transformation to market economies are experiencing higher growth than those that have only recently carried out reforms. The first group includes Poland, the Baltic countries, the Czech Republic, Hungary, the Slovak Republic, Croatia, and Slovenia. The second group includes Bulgaria, Romania, Russia, Ukraine, and other countries of the former Soviet Union.

The principal measure of the success of reform, which also coincides with higher GDP growth, is the degree of integration into the global economy--trade flows, investment flows, and currency convertibility. More liberalized trade arrangements, foreign direct investment, and portfolio inflows indicate the integration and relative competitiveness with the world at large, particularly with Europe and the other advanced economies. Russia and the Ukraine are completing the adjustment associated with the transition from centrally planned to market economies. Significant growth occurred in 2000 and 2001, and the baseline assumes that growth will continue throughout the next decade. However, important problems still persist in defining the social infrastructure for a free market economy and growth is projected to be slower than in the more progressive Central European countries.

**Central and Eastern Europe.** Poland and Hungary had significant growth in the second half of the 1990s, exceeding 4 percent on average, after undertaking market reforms and increasing openness to trade and competition. A reorientation of trade from the former Soviet Union to the West has contributed to their strong performance. But in some countries, like Bulgaria, reforms have only recently begun. Romania, which recently shed heavy state intervention in the economy, should soon expand in pace with its more advanced neighbors. The growth outlook for this region is relatively optimistic at rates approaching 5 percent annually over the next 10 years. For some of these economies, such as Poland and Hungary, it may be time to stop referring to them as “transition economies,” since the transition is largely completed. A crucial advantage these countries have over the former Soviet Union is proximity and closer integration with the European Union. Foreign direct investment will increase the region’s capacity to export. Integration into the EU will further stimulate technical transfer and productivity growth. As the crossroads between the East and the West, the region should benefit as trade increasingly flows through its countries.

**Former Soviet Union.** After a decade of economic retrenchments and setbacks, Russia and Ukraine have shown signs of benefiting from their transition to a market economy. The smaller countries of the region have been growing since 1996, with growth of about 1.5 percent in 1999. Overall GDP growth for the region is anticipated to average 3.5 percent between 2001-2005 and 3.4 percent from 2005 to 2011. This is a substantial increase from the significant economic contraction of the 1990s.

The financial crisis in 1998 seems to have led to a more serious view in Russia of the importance of macroeconomic stability. A properly managed economy with a stronger legal system and other public institutions could lay the groundwork for sustained growth in Russia. The depreciation of the ruble following Russia’s economic crisis in 1998 has improved the price competitiveness of domestic producers vis-à-vis the world market. As a major energy exporter,

Russia is favorably impacted by high oil prices. GDP is assumed in the baseline to grow at over 4 percent annually over the next decade in Russia.

Ukraine also has bounced back from the financial crisis. Significantly increased trade with Russia and the other former Soviet republics is critical to Ukraine's transition to a higher income country. Some opening and increased trade with Western Europe should also help. The turnaround in Ukraine is even more substantial than in Russia. After experiencing a negative 7.7 percent growth in real GDP in 1991-2000, growth is projected to average more than 4 percent in the projections period. The smaller countries of the FSU are expected to average higher growth rates because of increasing trade and production of agricultural products and natural resources, particularly crude oil and natural gas. With adequate definition of a more reliable legal system, significant inflows of foreign investments can lift growth prospects. This is particularly the case for energy rich republics such as Kazakhstan.

### **Developing Countries**

Overall, the developing countries will continue to maintain strong growth, averaging 4.7 percent over the next decade. Emerging markets in Latin America will continue to attract investment funds as long as they maintain well-managed macroeconomic policies resulting in relatively low inflation rates. Adoption of more flexible exchange rates in Southeast Asia will help prevent overvalued currencies and act to discourage inflows of speculative funds or excessive borrowing of foreign money. Continued structural adjustments should lead to stronger financial systems and stricter banking regulations. The risks of excessive lending will be reduced, resulting in more stable growth paths in the longer run.

**Mexico.** The Mexican economy has been hurt by the current slowdown in the United States, but will bounce back with renewed U.S. growth in 2002 and beyond. Long-term growth at rates above 4 percent a year is likely. The inflow of foreign capital and expanded trade with the United States because of NAFTA have boosted Mexico's production and export capacity. The real peso is again tending towards overvaluation and a period of depreciation will increase Mexican competitiveness.

Starting in 1996, the peso has appreciated in real terms against the U.S. dollar, largely because of Mexico's success in attracting foreign investment funds. Despite a floating exchange rate and inflation higher than in the United States, confidence in holding pesos and in the Mexican economy, in general, has been strong. But these gains in purchasing power have fueled Mexican imports, generating a trade deficit and a higher current account deficit. The long-term growth outlook of 4.7 percent reflects a continuing improvement in infrastructure and a buildup of competitive export industries in Mexico. These developments entail imports of capital and intermediate inputs that would raise the current account deficit beyond 2000.

**China.** The baseline assumes no accession to the World Trade Organization by China. China's economic growth has been consistently the strongest in Asia, although growth is expected to level off from double-digit gains in the early 1990s to a rate of 7.8 percent over the next decade. With population growth of less than 1 percent per year, per capita GDP gains will be about 7 percent annually. These gains will penetrate China's poor inner provinces and likely improve

productivity in the agricultural sector as more capital-intensive farming and food processing is undertaken. But real output gains are expected to be slowed by adjustment problems of unemployment, as privatization of state-owned enterprises accelerates, and by competition from foreign firms. Competition for lower-value export markets should intensify as other developing countries, including Vietnam and India, increasingly enter those markets.

Inflation has subsided to single digits and is assumed to remain in that range for the baseline. Credit supply will be directed less by the government and more by independent banks, and thus access to credit will increasingly be market-based. However, severe debt problems in China's largest banks have the potential to destabilize credit markets. The movement toward convertibility of the yuan in the capital account, which should attract more foreign equity funds, also will permit the outflow of domestic funds for foreign investments. Real wages will rise as worker productivity grows. The country's high savings rate will keep interest rates relatively low in spite of increasing demand for capital, especially to finance infrastructure projects.

**East and Southeast Asia.** Output growth in East and Southeast Asia is projected to come down somewhat over the next 5 years to 5.6 percent and recover to 6.4 percent in the following 5 years. Economic growth has resumed in these countries, but not at rates as high as before the Asia financial crisis. Long-term growth is projected to be about 2 percentage points lower than historical rates, excluding crisis years. Exports, buoyed by increased exchange rate competitiveness, and domestic demand, cushioned by high domestic savings, will lead the recovery.

Japan provides a market for about 13 percent of developing Asia's exports, and Japan's economy is expected to show only sluggish growth. Another 30 percent of exports go to the United States. About 40 percent of developing Asia's exports are typically destined for Asian markets other than Japan. Thus there is an internally supported dynamic to their high growth. A key to long-term growth is whether the appropriate structural reforms are undertaken in both the financial and manufacturing sectors. Although some structural reforms have been undertaken over the past several years, the pace of reforms is slower than was expected, limiting the potential for stronger economic growth.

Hong Kong, Taiwan, Malaysia, and Singapore are the most affected by the current world slowdown. China, based on its own internal dynamics, is only modestly affected by it. The return to strong growth in North America and Europe should help East Asian economies. China's continued strong GDP growth will remain a source of import demand for other East Asian exports. In addition, Indonesia is expected to benefit from trade liberalization and steps to increase competition in domestic markets that were undertaken during the financial crisis.

**South Asia.** South Asia continues its impressive growth over the projections period. Economic growth rates in South Asia are now projected to be almost equal to those in Southeast and East Asia over the longer term. India, which produces 82 percent of the area's output, is projected to grow, on average, by 5.6 percent annually. Pakistan is projected to grow more slowly, at around 4 percent per year. Bangladesh is projected to grow at 5 percent, representing per capita income growth of more than 3 percent. Like China, India's large and increasingly liberalized domestic market will provide the bulk of the impetus for growth. India should also be capable of

producing more diversified manufactured exports. Investment policy is increasingly liberalized and the inflow of foreign capital will boost the region's production capacity.

The proximity to energy sources in the Middle East and, in the future, to energy from Central Asia, should likewise be beneficial. Potentially in the long run, exports of higher-technology products and services, especially from India, will generate hard currency earnings needed to finance improvements in the region's infrastructure and industrial capacity. Competitive gains will depend on the region's low-cost labor, more open trade and investment policies, and real exchange rates that are not distorted by restrictions on capital flows.

**Africa and the Middle East.** Economic performance in the Middle East remains strongly tied to the outlook for petroleum export earnings. The region is projected to grow at a rate of about 3.5 percent in the baseline as macroeconomic performance strengthens with the global economy and oil prices increase in real terms. With population growth still around 2 percent, however, annual per capita GDP growth averages only about 1.5 percent over the decade.

In Africa, potential growth hinges on the performance of Egypt, Nigeria, and South Africa, the continent's largest countries. Whereas GDP growth in Egypt is projected to be relatively strong in the 5-percent range over the next 10 years, Nigeria and South Africa are not expected to grow as fast. Nigeria, because of continued political instability, corruption, and a largely unskilled labor force, will be unable to attract enough foreign investment and take advantage of its abundant oil resources. In South Africa, a large labor force of unskilled workers, high interest rates because of budget problems, and continued social discontent will pose risks for investors and limit growth. South Africa is also greatly affected by the AIDS pandemic, which will present some serious economic and health system challenges. Nonetheless, growth will move toward a 3-percent rate, a considerable improvement over the 1.5 percent growth rate of the 1990s. The politically troubled countries of Algeria, Sudan, and Congo will drag overall growth down in North Africa and in Sub-Saharan Africa. Nevertheless, increased North African trade with Europe and market reforms in some East and West African countries are generating relatively faster growth. For the first time in many decades, the more optimistic growth scenarios translate into significant per capita income increases. Africa's population growth has been slowing, resulting in positive per capita income growth of about 2.5 percent a year.

**South America.** Solid economic growth is projected for South America for the next decade, led by Brazil. However, Argentina is currently in a recession that has been partly caused by the peg of the peso to the dollar. This currency peg is assumed to continue in the baseline which does not reflect the devaluation of the Argentine peso in early 2002. In the out years, Argentina is projected to recover to a rate of 3.6 percent a year. South America has projected growth of 3.6 percent over the decade with the out years at 4.2 percent. Behind the strong growth is reduced debt, less government intervention in the private sector, growing intra-regional trade, and heavier foreign direct investment. The past environment of overvalued currencies, large trade deficits, fiscal deficits, and low internal investment due to low savings is not expected to return. New economic policies now generate less inflation and more competitive industries as import barriers fall. Savings as a share of GDP are projected to rise, but levels will remain lower than in East



and Southeast Asia. Because of this, the region's general dependence on foreign capital introduces the risk of capital flight in response to external shocks such as higher U.S. interest rates.

### **World Population Growth**

Population assumptions were updated in October 2001 using data obtained from the U.S. Bureau of the Census.

Population growth rates have been declining consistently over the past few decades. Overall, population growth rates for Africa decline from 2.1 percent a year in the 1990s to a projected 1.5 percent rate in the out years of the baseline. Population growth projections have also declined markedly in some Asian countries. In particular, population growth rates for India have fallen from 1.8 percent in the 1990s to 1.4 percent projected for the next decade. This pattern of decelerating population growth rates has important implications for economic growth and wealth creation. Slowing population growth implies increasing aging of the population and also increasing dependence ratios (the ratio of workers to nonworkers in the population).

Overall world population growth is projected to increase at only 1.2 percent a year over the projections period, a 0.2 percent decline from the previous decade. Almost all population growth is occurring in developing countries. Growth in developed countries is less than 0.4 percent per year. The highest growth rates are for the Middle East and Sub-Saharan Africa at around 2 percent per year. These are also the countries with the lowest per capita incomes and, historically, the lowest growth in per capita income.

In some countries, the slowdown of population growth rates has been quite dramatic. For example, South Africa saw its population growth rate decline from an average of 2.7 percent in the 1980s to 1.3 percent in the 1990s. Population in South Africa is projected to decline in the next decade due to the AIDS pandemic. The lowest population growth rates have occurred and are projected to continue to be in the transition economies. In some countries in this region, populations have been declining consistently since the 1980s. Hungary in particular has been losing population at a rate of about 0.3 percent per year. Russia has also had declining population since the 1990s. Overall, the transition economies are projected to have virtually no population growth over the next decade.

Populations in the developed economies are projected to grow by less than 0.5 percent per year, with the slowest rates in Japan and the European Union. Overall, the number of people in the world is projected to increase at a declining rate, to 6.9 billion in 2011 and almost 8 billion by 2025. Less than 13 percent will live in developed countries.

Because of differing rates of population growth, GDP gains translate into per capita income growth at differing rates (the rate of per capita income growth equals the GDP growth rate minus the population growth rate). The highest growth rate in per capita income is in China, which has both very high GDP growth rates and low population growth rates. The lowest per capita income growth rates are in Africa and the Middle East where GDP growth rates are relatively modest and population growth rates are high. The pattern toward slowing population growth

rates and increasing per capita income growth rates will have profound impacts on agricultural trade over the coming decade as rising income leads to demand for more high value products and less basic products. This compositional change in agricultural demand and trade should continue and even accelerate during the projections period.

Table 1. Domestic macroeconomic baseline assumptions

Item	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
GDP, billion dollars												
Nominal	9,873	10,212	10,541	11,117	11,760	12,440	13,159	13,919	14,710	15,545	16,427	17,360
Real 1996 chained dollars	9,224	9,335	9,465	9,787	10,100	10,424	10,757	11,101	11,446	11,800	12,166	12,543
percent change	4.1	1.2	1.4	3.4	3.2	3.2	3.2	3.2	3.1	3.1	3.1	3.1
Disposable personal income												
Nominal (billions)	7,031	7,390	7,641	8,076	8,537	9,006	9,502	10,024	10,575	11,147	11,748	12,371
percent change	6.2	5.1	3.4	5.7	5.7	5.5	5.5	5.5	5.5	5.4	5.4	5.3
Nominal per capita, dollars	25,528	26,581	27,240	28,536	29,922	31,317	32,777	34,305	35,902	37,536	39,242	40,986
percent change	5.3	4.1	2.5	4.8	4.9	4.7	4.7	4.7	4.7	4.6	4.5	4.4
Real (billion 1996 chained)	6,539	6,755	6,877	7,124	7,359	7,580	7,807	8,042	8,283	8,523	8,770	9,016
percent change	3.5	3.3	1.8	3.6	3.3	3.0	3.0	3.0	3.0	2.9	2.9	2.8
Real per capita, 96 dollars	23,742	24,299	24,515	25,171	25,795	26,358	26,933	27,520	28,119	28,701	29,295	29,870
percent change	2.6	2.3	0.9	2.7	2.5	2.2	2.2	2.2	2.2	2.1	2.1	2.0
Consumer spending												
Real (billion 1996 chained)	6,258	6,442	6,538	6,741	6,937	7,138	7,345	7,558	7,777	8,002	8,235	8,473
percent change	4.8	2.9	1.5	3.1	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Inflation measures												
GDP price index, chained	107.0	109.4	111.4	113.6	116.4	119.3	122.3	125.4	128.5	131.7	135.0	138.4
percent change	2.3	2.2	1.8	2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
CPI-U, 82-84=100	172.2	177.4	181.1	185.4	190.3	195.2	200.3	205.5	210.8	216.3	221.9	227.7
percent change	3.4	3.0	2.1	2.4	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
PPI, finished goods 82=100	138.0	141.5	143.4	146.0	149.1	152.2	155.4	158.7	162.0	165.4	168.9	172.4
percent change	3.7	2.5	1.4	1.8	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
PPI, crude goods 82=100	120.6	124.1	120.1	117.7	119.2	120.7	122.2	123.7	125.3	126.8	128.4	130.0
percent change	22.8	2.9	-3.2	-2.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Crude oil price, \$/barrel												
Refiner acq. cost, imports	28.2	24.3	23.0	22.3	23.0	23.6	24.3	24.9	25.6	26.4	27.1	27.9
percent change	63.5	-13.8	-5.3	-3.1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Real cost, 1996 chained dollars	26.4	22.3	20.7	19.7	19.7	19.8	19.8	19.9	20.0	20.0	20.1	20.1
percent change	59.8	-15.6	-7.0	-5.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Labor compensation per hour												
nonfarm business, 92=100	132.0	139.8	145.7	152.4	158.3	164.5	170.9	177.6	184.5	191.7	199.1	206.9
percent change	6.1	5.9	4.2	4.6	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Interest rates, percent												
3-month T-bills	5.8	3.5	2.6	3.4	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
6-month commercial paper	6.3	3.8	2.8	3.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Bank prime rate	9.2	7.0	5.6	6.4	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
Treasury bonds (10-year)	6.0	4.9	4.8	5.2	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Moody's Aaa bonds	7.6	7.2	6.2	6.5	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
Civilian unemployment												
rate, percent	4.0	4.8	5.3	5.1	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Nonfarm payroll emp., millions	131.9	131.8	132.5	134.1	135.7	137.3	138.9	140.6	142.1	143.7	145.3	146.9
percent change	1.3	-0.1	0.5	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1
Total population, million	275.4	278.0	280.5	283.0	285.3	287.6	289.9	292.2	294.6	297.0	299.4	301.8
percent change	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

Domestic macroeconomic assumptions were completed in September 2001.

Table 2. Global real GDP baseline growth assumptions

Region/country	Share of world GDP 1996-2000	1999	2000	2001	2002	2003	2004	2005	Average		
									1991-2000	2001-2005	2006-2011
	Percent										
	Percent change										
World	100.0	3.1	3.9	1.6	2.0	3.3	3.3	3.3	2.7	2.7	3.3
less United States	75.7	2.8	3.9	1.7	2.2	3.2	3.3	3.3	2.6	2.7	3.4
Developed economies	75.7	2.9	3.4	1.2	1.5	2.7	2.6	2.6	2.3	2.1	2.6
United States	24.3	4.1	4.1	1.2	1.4	3.4	3.2	3.2	3.1	2.5	3.1
Canada	2.4	5.1	4.4	1.8	2.0	2.9	3.0	3.0	2.7	2.5	3.0
Japan	11.6	0.8	1.5	-1.0	0.0	1.5	1.9	1.9	1.2	0.9	1.9
Australia	1.4	4.7	3.7	2.0	2.4	3.5	4.0	4.0	3.6	3.2	4.0
European Union-15	34.5	2.5	3.4	1.8	1.9	2.6	2.4	2.4	2.2	2.2	2.4
Other Western Europe	1.4	1.6	3.0	1.8	1.9	2.4	2.4	2.4	1.8	2.2	2.4
Transition economies	2.2	3.2	5.1	3.4	3.5	3.9	3.9	3.8	-2.9	3.7	3.7
Eastern Europe	0.7	2.7	3.7	3.1	3.7	4.7	4.6	4.5	1.3	4.1	4.4
Czech Republic	0.1	-0.4	3.1	3.5	3.8	4.9	4.8	4.7	-0.6	4.3	4.6
Hungary	0.1	4.2	5.2	3.7	3.9	4.9	4.9	4.9	0.9	4.5	4.9
Poland	0.3	4.1	4.1	1.9	2.8	4.6	4.6	4.6	3.8	3.7	4.6
Former Soviet Union	1.5	3.4	5.9	3.5	3.5	3.5	3.5	3.5	-4.4	3.5	3.4
Russia	0.8	5.4	8.3	4.5	4.2	4.1	4.1	4.1	-3.9	4.2	4.1
Ukraine	0.1	-0.4	6.0	4.0	4.1	4.7	4.4	3.9	-7.7	4.2	3.9
Other	0.5	1.5	2.0	1.8	2.0	2.2	2.2	2.2	-4.1	2.1	1.9
Developing countries	22.1	3.8	5.6	2.6	3.5	4.9	5.1	5.1	4.9	4.2	5.2
Asia	10.0	6.3	6.8	4.2	4.9	6.0	6.2	6.2	6.9	5.5	6.2
East & Southeast Asia	7.6	6.6	7.4	4.2	4.9	6.2	6.3	6.3	7.3	5.6	6.4
China	3.1	7.1	8.0	7.5	7.3	7.8	7.8	7.8	10.1	7.6	7.8
Hong Kong	0.4	2.9	10.5	2.5	4.0	4.8	5.0	5.0	4.5	4.3	5.0
Korea	1.5	10.9	8.8	2.5	3.5	5.4	5.2	5.0	6.3	4.3	5.0
Taiwan	1.0	5.7	6.0	0.5	2.0	4.8	5.2	5.2	7.4	3.5	5.2
Indonesia	0.6	0.8	4.8	2.0	2.5	4.0	5.0	5.0	4.4	3.7	5.0
Malaysia	0.3	6.1	8.3	0.0	3.5	5.6	5.4	5.2	6.7	3.9	5.2
Philippines	0.2	3.2	4.0	1.5	2.0	3.5	4.5	4.5	2.9	3.2	4.5
Thailand	0.5	4.2	4.3	1.2	3.0	4.0	4.9	5.3	4.6	3.7	5.6
Vietnam	0.0	4.8	6.8	4.5	5.0	5.8	5.8	5.8	7.7	5.4	5.8
South Asia	2.0	6.0	5.2	4.4	5.1	5.7	5.8	5.8	5.5	5.4	5.8
India	1.7	6.4	5.2	4.6	5.3	6.0	6.0	6.0	5.7	5.6	6.0
Pakistan	0.2	2.7	4.8	2.5	3.0	3.7	3.8	4.0	4.0	3.4	4.2
Bangladesh	0.1	5.2	6.0	5.0	5.0	5.3	5.2	5.1	5.0	5.1	4.9
Latin America	5.2	1.0	3.9	0.7	1.4	3.6	4.3	4.3	3.3	2.9	4.3
Caribbean & Central America	0.4	3.8	3.9	1.8	2.0	4.2	4.1	3.5	3.2	3.1	3.4
Mexico	1.2	3.9	6.9	0.0	1.5	4.7	4.7	4.7	3.6	3.1	4.7
South America	3.7	-0.2	2.9	0.8	1.3	3.2	4.1	4.2	3.2	2.7	4.2
Argentina	0.7	-3.4	-0.5	-1.5	-1.5	1.0	3.3	3.3	4.3	0.9	3.6
Brazil	2.0	0.8	4.5	1.2	2.0	3.8	4.4	4.5	2.7	3.2	4.5
Other	0.9	0.2	2.0	1.8	2.0	3.5	4.2	4.1	3.4	3.1	4.0
Middle East	5.0	2.3	6.0	1.0	2.6	3.7	3.9	4.0	4.1	3.0	4.0
Iran	2.6	2.5	5.0	3.0	2.5	3.5	3.6	3.7	4.0	3.3	3.8
Iraq	0.2	25.0	25.0	-5.7	7.0	6.0	5.5	5.5	8.4	3.7	5.2
Saudi Arabia	0.4	0.4	4.5	4.1	3.0	3.5	3.7	3.7	2.0	3.6	3.7
Turkey	0.7	-5.1	7.5	-7.3	1.0	3.0	4.0	5.0	3.7	1.1	4.3
Other	1.0	4.2	4.2	2.0	2.5	4.2	4.1	4.0	6.1	3.4	4.0
Africa	2.0	2.8	3.5	3.5	3.7	4.6	4.6	4.4	2.6	4.2	4.2
North Africa	0.7	4.1	3.4	3.5	3.7	5.2	5.1	5.0	3.0	4.5	4.7
Algeria	0.2	3.5	2.4	3.0	3.2	4.4	4.3	4.3	1.6	3.8	4.1
Egypt	0.3	6.0	4.7	3.5	3.8	5.8	5.7	5.6	4.3	4.9	5.3
Morocco	0.1	-0.7	0.9	4.0	4.2	5.0	4.9	4.8	2.2	4.6	4.7
Tunisia	0.1	6.2	5.0	4.0	4.2	5.3	5.0	4.9	4.8	4.7	4.6
Sub-Saharan Africa	0.9	2.1	3.8	4.1	4.2	4.9	5.0	4.6	2.8	4.6	4.4
South Africa	0.4	1.9	3.1	2.6	2.8	2.7	3.2	3.0	1.5	2.9	2.8

Global macroeconomic assumptions were completed in October 2001.

Table 3. Baseline population growth assumptions

Region/country	Population in 2000	1999	2000	2001	2002	2003	2004	2005	Average		
									1991-2000	2001-2005	2006-2011
	Millions	Percent change									
World <sup>1</sup>	6,080	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.4	1.2	1.1
less United States	5,805	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.4	1.2	1.1
Developed economies	847	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.6	0.5	0.4
United States	276	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.8
Canada	31	1.1	1.0	1.0	1.0	1.0	0.9	0.9	1.2	1.0	0.9
Japan	127	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.0
Australia	19	1.1	1.0	1.0	1.0	0.9	0.9	0.9	1.2	0.9	0.8
European Union-15	378	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1
Transition economies	416	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.1
Eastern Europe	126	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1
Czech Republic	10	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.2
Hungary	10	-0.4	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.3
Poland	39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Former Soviet Union	291	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.0	0.2
Russia	146	-0.3	-0.4	-0.4	-0.3	-0.3	-0.3	-0.3	-0.1	-0.3	-0.2
Ukraine	49	-0.8	-0.8	-0.8	-0.7	-0.7	-0.7	-0.6	-0.5	-0.7	-0.5
Other	95	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.7	0.7	1.0
Developing countries	4,480	1.5	1.4	1.4	1.4	1.3	1.3	1.3	1.6	1.3	1.2
Asia	3,301	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.5	1.3	1.1
East & Southeast Asia	1,848	1.1	1.1	1.1	1.0	1.0	1.0	0.9	1.2	1.0	0.8
China	1,262	0.9	0.9	0.9	0.9	0.9	0.8	0.8	1.0	0.8	0.6
Hong Kong	7	2.6	1.8	1.3	1.3	1.2	1.2	1.2	2.3	1.2	1.1
Korea	47	1.0	0.9	0.9	0.9	0.8	0.8	0.8	1.0	0.8	0.6
Taiwan	22	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.7
Indonesia	225	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.8	1.6	1.3
Malaysia	22	2.1	2.1	2.0	1.9	1.9	1.9	1.8	2.2	1.9	1.8
Philippines	81	2.1	2.1	2.1	2.0	2.0	2.0	1.9	2.2	2.0	1.8
Thailand	61	1.0	1.0	0.9	0.9	0.9	0.8	0.8	1.1	0.9	0.7
Vietnam	79	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.7	1.4	1.3
South Asia	1,285	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.8	1.6	1.4
India	1,014	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.8	1.5	1.3
Pakistan	142	2.2	2.2	2.2	2.1	2.1	2.0	1.9	2.2	2.1	1.8
Bangladesh	129	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5
Latin America	521	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.6	1.3	1.1
Caribbean & Central America	74	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.7	1.5	1.4
Mexico	100	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.7	1.5	1.3
South America	347	1.4	1.3	1.2	1.2	1.2	1.1	1.1	1.6	1.2	1.0
Argentina	37	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.3	1.1	1.0
Brazil	173	1.1	1.0	0.9	0.9	0.9	0.8	0.8	1.4	0.9	0.7
Other	137	1.8	1.7	1.7	1.6	1.6	1.5	1.5	1.9	1.6	1.4
Middle East	242	2.0	1.9	1.9	1.9	1.9	1.9	2.0	2.2	1.9	2.0
Iran	66	1.1	0.9	0.8	0.7	0.8	1.1	1.3	1.7	0.9	1.4
Iraq	23	3.0	2.9	2.9	2.9	2.8	2.8	2.8	2.3	2.8	2.6
Saudi Arabia	22	3.4	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Turkey	66	1.4	1.3	1.3	1.2	1.2	1.2	1.1	1.6	1.2	1.0
Other	66	2.8	2.8	2.7	2.7	2.7	2.7	2.6	3.0	2.7	2.6
Africa	415	1.9	1.8	1.8	1.7	1.7	1.6	1.6	2.1	1.7	1.5
North Africa	139	1.8	1.7	1.7	1.7	1.6	1.6	1.5	2.0	1.6	1.5
Algeria	31	1.9	1.8	1.7	1.7	1.7	1.6	1.6	2.1	1.7	1.5
Egypt	68	1.8	1.8	1.7	1.7	1.7	1.6	1.6	2.0	1.6	1.5
Morocco	30	1.8	1.8	1.7	1.7	1.7	1.6	1.6	2.0	1.7	1.5
Tunisia	10	1.3	1.2	1.2	1.1	1.1	1.1	1.0	1.6	1.1	1.0
Sub-Saharan Africa	233	2.1	2.1	2.1	2.1	2.0	2.0	2.0	2.3	2.0	1.9
South Africa	43	0.7	0.6	0.4	0.1	-0.1	-0.3	-0.6	1.3	-0.1	-1.0

Source: U.S. Department of Commerce, Bureau of the Census. The population assumptions were completed in October 2001.

1/ Totals for the world and world less United States include countries not otherwise included in the table.

## **Crops**

Several major U.S. field crops continue to receive safety net assistance during the projection period through marketing loan benefits provided by the 1996 Farm Act. Soybeans receive these benefits in the early years of the baseline, and rice and cotton receive benefits for the entire period. In contrast, there are no significant marketing loan benefits for wheat and feed grains, reflecting projected prices and the baseline's assumed use of formula loan rates. In the initial years of the baseline, U.S. corn and wheat markets adjust to reduced global supplies and weak U.S. exports, before moving back to a longer-term trend of consumption growth. The U.S. soybean sector adjusts to large global supplies early in the baseline by reducing record acreage and supplies and is aided by record exports, before returning to a longer-term consumption trend. The U.S. rice sector adjusts to large U.S. supplies and exports in the beginning of the baseline period before resuming a long-term trend with increasing domestic use offsetting U.S. rice export declines. U.S. cotton adjusts to large global supplies and consumption in the early years of the baseline, but then adjusts to a long-term trend of declining consumption in response to increased foreign competition. In the longer run, the global economy provides growth in consumption, trade, and exports for most U.S. field crops, but gains in trade are constrained by a strong U.S. dollar and by export competition for some important markets.

### **Major Policy Assumptions**

The baseline assumes a continuation of current agricultural legislation. Most policy features assumed reflect provisions of the 1996 Farm Act. Major domestic policy assumptions for field crops are summarized in this section.

#### **Production Flexibility Contracts**

Decoupled income support payments provided through 2002 under 7-year production flexibility contracts of the 1996 Farm Act are assumed to continue through the baseline, with annual funding for contract payments remaining at the 2002 level of \$4.008 billion. Payment levels are allocated among contract crops (wheat, corn, grain sorghum, barley, oats, rice, and upland cotton) according to percentages specified in the 1996 Farm Act (table 4). Production flexibility contract payment rates for each of these crops (table 5) are paid on a payment quantity equal to 0.85 times the farm program payment yield times the contract acreage.

#### **Marketing Assistance Loans**

Starting in 2002, the baseline assumes that marketing assistance loan rates for corn, wheat, upland cotton, and oilseeds will be determined based on formulas in the 1996 Farm Act, subject to the maximum levels specified in the law for these crops and the minimum levels specified for upland cotton and oilseeds (table 5). Under this assumption, loan rates for corn and wheat decline in the early part of the baseline, but return to their maximum levels later in the projection period as market prices strengthen. In contrast, legislative minimum loan rates for soybeans and cotton constrain the full use of the price-based formulas. Thus, loan rates for those crops fall to those minimums and remain at those levels for most of the baseline. Loan rates for sorghum,

barley, and oats are assumed to be set in relation to the corn loan rate, taking into account their feed values relative to corn as measured by ratios of 5-year lagged moving average prices relative to corn prices. The loan rate for rice is set at \$6.50 per hundredweight.

Marketing loan provisions allow the repayment of commodity loans at less than the loan rate when posted county prices (wheat, feed grains, and oilseeds) or world prices (upland cotton and rice) are below the loan rate. Also, loan deficiency payments may instead be made to eligible producers of wheat, feed grains, upland cotton, rice, and oilseeds who agree to forgo obtaining a loan.

### **Commodity Certificates**

The baseline assumes that commodity certificates will be available to producers of wheat, rice, feed grains, upland cotton, soybeans, and other designated oilseeds throughout the projections period. Commodity certificates may be purchased by producers with outstanding nonrecourse marketing assistance loans for these crops and then immediately exchanged for the commodities pledged as collateral for those loans. Certificates are primarily designed to limit loan program forfeitures of crops to the government—they facilitate the repayment of loans when producers would not otherwise be able to exercise their full opportunity to repay those loans. In so doing, certificates provide a vehicle for producers to receive marketing loan benefits unconstrained by payment limitations.

### **Cotton User Marketing Payments**

The baseline assumes that cotton user marketing payments (the Step 2 program) continue to be made to domestic users and exporters of upland cotton throughout the projections whenever the lowest-priced U.S. growth of upland cotton quoted for delivery in Northern Europe exceeds the Northern Europe price by more than 1.25 cents per pound for 4 consecutive weeks, and if during the same 4-week period, the adjusted world price does not exceed 134 percent of the base U.S. loan rate. Payments are made in cash or certificates to domestic users on documented raw cotton consumption and to exporters on documented export shipments during the fifth week at a payment rate equal to the difference between the U.S. price and the Northern Europe price, minus 1.25 cents per pound during the fourth week of the period.

### **Emergency, Disaster, and Market Loss Assistance**

The baseline assumes that no further emergency, disaster, or market loss assistance payments are made after those specified in the Crop Year 2001 Agricultural Economic Assistance Act and in the fiscal year 2002 agricultural appropriations legislation.

### **Conservation Reserve Program**

The baseline assumes that the amount of land enrolled in the Conservation Reserve Program (CRP) will gradually build from 33.7 million acres in fiscal year 2001 to its maximum level authorized in the 1996 Farm Act of 36.4 million acres in 2005, and remain at this level for the rest of the projection period (table 6). The allocation of the CRP to specific crops for 2000 and

2001 reflects plantings for those years, with the 2001 allocation assumed for subsequent years. Acreage allocated to wheat, corn, and soybeans accounts for about half of the CRP area throughout the baseline.

### **Bioenergy Program and Ethanol**

A Bioenergy Program was announced by USDA in October 2000 for fiscal years 2001 and 2002, with an annual program level of \$150 million assumed in the baseline for each of those two years. The program provides incentive payments to ethanol and biodiesel producers who expand bioenergy production from eligible commodities.

The federal tax credit for ethanol use extends through 2007 and is assumed in the baseline to continue through the end of the projections.

The baseline also assumes that many States will ban methyl tertiary butyl ether (MTBE) as a gasoline additive, including California in 2003 and New York in 2004. This results in increasing production of ethanol, an alternative oxygenate, and greater use of corn in that industry.

### **Export Enhancement Program**

The annual expenditure limit for the Export Enhancement Program (EEP), set in the Uruguay Round Agreement on Agriculture, is \$478 million beginning in fiscal year 2001. This funding level is assumed in the budget to be available for EEP programming in subsequent years should market conditions warrant. However, the baseline commodity supply and demand projections assume no use of the EEP for crops.

### **Land Use**

The 1996 Farm Act provides nearly full planting flexibility, permitting producers to respond to net returns in their acreage allocation decisions. In this policy environment, area planted to a particular crop is primarily a function of its expected net returns per acre relative to those of competing crops. In addition to returns from the marketplace, marketing loan benefits also enter into acreage response decisions. These benefits have a direct impact in the baseline on returns and acreage decisions for soybeans, cotton, and rice, and an indirect impact on acreage for competing crops. Thus, expected net returns are a function of market prices augmented by marketing loan benefits in years when prices are near loan rates, productivity in the form of yields, and variable costs. Changes in acreage for specific crops reflect relative net returns for competing crops and the relative magnitude of crop-specific acreage responses to those returns. Land-use competition is particularly strong between corn and soybeans, where the mix of plantings is quite responsive to changes in relative prices and relative program benefits. For example, although continued marketing loan benefits support soybean net returns and acreage, increasing returns for competing crops are projected to curtail soybean plantings between 2003 and 2005. Although production flexibility contract payments augment farmers' income, these payments are not linked to production choices or market conditions. They are therefore deemed "decoupled" and are not considered to have significant effects on producers' planting decisions.



Area planted to the eight major U.S. program crops (corn, sorghum, barley, oats, wheat, rice, upland cotton, and soybeans) is expected to rise to 256.7 million acres in 2011 (table 7), somewhat less than the recent high level of plantings, 260.5 million acres, attained in 1996. Compared to 1996, expectations are for fewer planted acres of wheat, sorghum, barley, oats, and upland cotton, while more area is devoted to corn, soybeans, and rice. Aggregate crop area is projected to generally increase throughout the baseline period, attributed mostly to rising corn, wheat, and soybean area. This land-use increase reflects producer response to generally rising net returns as demand and prices strengthen. Total harvested acreage for major crops mirrors aggregate planted area.

Area planted to feed grains rises for most of the projection period. Planted area to corn is anticipated to remain relatively large and grow slowly over the forecast period, as use strengthens and prices improve. Area planted to soybeans is anticipated to decline through the middle of the projection period and then rise to a record 76.3 million acres in 2011. Stronger returns for competing crops are seen curtailing soybean plantings between 2003 and 2005, but soybean plantings rise later as soybean prices and returns increase. Wheat planted area remains constant for the initial years of the baseline, but market prices rise sufficiently to entice additional wheat acreage beginning in 2005. Rice area is projected to decline slightly to 3.2 million acres in the later periods as soybeans provide a better return per acre. Planted area of upland cotton is projected to decline from 15.1 to 13.8 million acres in response to reduced relative net returns.

### **Crop Supply and Demand Overview**

During the beginning of the baseline period, the corn and wheat sectors adjust to reduced global supplies and recovering exports accompanied by firm growth in domestic consumption, whereas soybeans, cotton, and rice are faced with large global supplies and low prices. Acreage for corn and wheat is initially flat but then is expected to increase as prices and returns improve. Plantings for soybeans, rice, and cotton are projected to decline from recent large levels, but soybean area recovers and establishes a new record in 2011. Later in the projection period, aggregate acreage rises in response to improving net returns per acre. However, yield gains for many crops are sufficient to support much of the needed production growth, thereby mitigating the need to increase total land use.

The domestic market is the main component of use for the major field crops. However, the export market is projected to increase in importance for several commodities. Gains in projected disappearance for wheat and sorghum are driven by exports, with U.S. trade showing larger absolute increases and growth rates than domestic demand. Exports of corn grow at faster rates than its domestic use, but absolute increases in domestic use are larger than trade gains, reflecting the relative size of its utilization categories. In contrast, projected increases in consumption for barley, oats, rice, soybeans, soybean oil, and soybean meal are driven mainly by domestic use. Growth in domestic consumption for these crops is larger than exports in both absolute and percentage terms. Stocks-to-use ratios decline for corn, wheat, and soybeans, with nominal prices rising.

Feed grain area declines slightly in 2003 before rising over the remainder of the projection period, with yields accounting for most gains in production. Feed grain prices rise throughout the baseline period, as stocks-to-use ratios are expected to decline. Throughout the baseline period, domestic feed grain use is projected to set new records. Feed grain exports are expected to grow about 25 percent, a much more robust growth rate than the past two decades. In the later years of the baseline, feed grain plantings rise in response to higher producer returns resulting from growth in exports and steady gains in the domestic market. Larger livestock inventories boost feed use, while food, seed, and industrial (FSI) use increases mainly due to growth in ethanol use. U.S. export gains are expected to be larger in the later years of the baseline period, as competitors' stocks are reduced early in the baseline.

U.S. wheat production is expected to rise throughout the baseline period. Initially, U.S. wheat area is constant but then is expected to expand in response to increased net returns. Yields are projected to rise at nearly twice the rate of harvested area. Total consumption of U.S. wheat is projected to rise throughout the projection period, accompanied by declining stocks-to-use ratios and rising prices. Beginning in 2003/04, food use of wheat is projected to rise 10 million bushels per year, consistent with rates of population growth. Wheat feed and residual use is expected to adjust downward and remain steady for most of the baseline period as wheat prices rise relative to corn. U.S. wheat exports decline initially, but then are expected to rise over the rest of the projection period. However, continued competition will hold the U.S. share of global wheat trade below the levels of the late 1990s.

U.S. rice area is projected to decline slightly in the later part of the baseline period, as relative net returns are not sufficient to maintain acreage levels. Annual rice production is expected to rise from 203 to 209 million hundredweight during the projection period, as small yield increases offset the modest decline in area. U.S. rice imports are projected to expand about 2.5 percent annually over the baseline period, reaching a record 14 million hundredweight by 2011/12. Steady growth in domestic use of rice is projected, driven by food use, with gains of about 2 percent per year. U.S. rice exports remain strong in the early part of the baseline, a result of declining price differences compared with prices of major competitors in the global market and abundant U.S. supplies, but exports decline slowly for the remainder of the period. Most U.S. exports go to high-quality markets, rarely competing with the low-cost Asian exporters in lower quality rice markets. Domestic producer prices are expected to rise slowly over the next decade as international prices begin to increase from recent low levels. However, world prices are projected to remain below U.S. loan rates during the baseline, thereby making U.S. producers eligible for marketing loan benefits. Rice producers' net returns are projected to decline from \$95 per acre in 2002/03 to \$88 in 2007/08 and slowly rise thereafter as higher farm prices more than offset declining marketing loan benefits.

U.S. upland cotton production is projected to decline from 18 million to 17 million bales during the baseline period as declines in planted area offset slight gains in yields. Planted area is expected to fall from 15 million to 13.8 million acres during the baseline period. Cotton disappearance is expected to rise in the early years of the baseline as global consumption expands, but then declines somewhat through the end of the period. Domestic mill use declines by 7 percent over the baseline due, in part, to the full phaseout of the Multi-Fiber Arrangement's (MFA) textile and apparel import quotas scheduled for 2005. In contrast,

cotton exports are expected to remain at 10 to 10.5 million bales for the first several years of the baseline. Upland exports decrease slightly each year for the remainder of the period, but remain well above mill use. Despite the aid of Step 2 payments, foreign competition contributes to the decline in exports. Ending stocks of upland cotton are projected to decline throughout much of the baseline period, as are stocks-to-use ratios, before stabilizing towards the end of the projections.

U.S. soybean area is anticipated to decline through the middle of the projection period, but rise thereafter to a record 76.3 million acres in 2011. Stronger returns for competing crops are seen curtailing soybean plantings between 2003 and 2005, even though marketing loan benefits continue to support soybean net returns. Soybean production is expected to reach 3.3 billion bushels on 75.3 million harvested acres by the end of the baseline. Producer prices for U.S. soybeans are projected to rise to \$6.20 a bushel by the end of the baseline as supplies come into closer balance with demand. Lower world market soybean prices initially are expected to slow foreign production somewhat, allowing the United States to capture a slightly larger market share of the world soybean market. However, as soybean prices increase, foreign soybean output strengthens and is expected to curtail growth in U.S. soybean exports. Ample soybean supplies and low soybean prices are expected to accelerate domestic crushing in 2002/03 and 2003/04, but tightening domestic soybean supplies and a revival in foreign meal output are projected to slow growth in U.S. meal exports. U.S. soybean oil prices, the lowest since 1971, are anticipated to rise throughout the baseline as consumption converges with supply.

### **Feed Grains**

Feed grain production increases throughout the projection period, as yields account for most of the increase in production. Corn is expected to gain in share of total feed grain production and use. Corn area is projected to experience minor growth over the baseline period. Sorghum plantings are expected to decline through 2003 and slowly rise over the remaining period, returning to the 2002 level. Planted area for barley and oats is not expected to change during the projection period. Net returns for the other feed grains increase over the forecast period, but continue low relative to corn.

Throughout the baseline period, total feed grain use is projected to set new records. Exports are expected to grow about 25 percent, a much more robust growth rate than over the past two decades, but remain lower than the record set in 1979. Despite improved growth in global imports, U.S. feed grain exports are expected to encounter strong competition throughout the projection period.

U.S. ending stocks of feed grains are projected to drop throughout the baseline period to around 31 million metric tons. These ending stocks are much below the average ending stocks in the 1990s of 41 million tons, or the average ending stocks in the 1980s of 85 million tons, characterized by large stockholding due to government programs. As the stocks-to-use ratio declines throughout the baseline, corn prices are expected to rise to \$2.60 per bushel in 2011/12. Productivity is projected to account for about 80 percent of production growth with the remaining increase in production coming from increased plantings.

## Corn

The corn sector starts the baseline with stronger prices than the past several years, reflecting total use growing faster than total supply. At the onset of the baseline, domestic corn use is strong, and continues growing throughout the period. In the first year of the baseline, U.S. corn exports drop as normal weather boosts production by competing suppliers and some major importers. Longer-term growth of U.S. corn exports reflects the U.S. corn sector remaining competitive in global markets, a rising global meat demand, and China becoming a net importer later in the baseline period.

Planted area for corn is projected to remain relatively large, and to grow slowly over the forecast period, as use strengthens and prices improve. Corn competes mostly with soybeans for land and is used extensively in rotations with soybeans. Corn area grows relative to soybeans as relative net returns are expected to favor corn throughout most of the baseline.

Gains in corn yields are expected to continue over the entire baseline period, facilitated by genetic improvements and farming practices, such as timely planting and effective input use. Corn production is projected to increase throughout the baseline, surpassing the previous record of 10.1 billion bushels by 2004.

Feed and residual use is expected to drop in the initial year of the forecast period but grow throughout the remainder of the projection period. Reduced numbers of cattle on feed in the first year account for most of the initial decline but increasing meat production and grain-consuming animal units in the U.S. livestock sector account for rising use of grain for the remaining projection period. In addition, feed and residual use of other grains remains low relative to earlier periods.

Food, seed, and industrial (FSI) use of corn is anticipated to increase throughout the baseline period, beginning at a record level. Major growth is expected in ethanol use because many States are banning methyl tertiary butyl ether (MTBE). Ethanol is the principal replacement oxygenate for those States that use reformulated gas requiring 2 percent by weight oxygen. Greater corn use is projected in the baseline as the ethanol industry expands its production. In addition, corn use is boosted in the initial year of the baseline by the bio-energy program, which provides payments for additional production. Policy is a critical determinant of the quantity of corn used for ethanol and different policies could drastically change the use of ethanol in fuels. Gains for high fructose corn syrup (HFCS) and most of the other food and industrial components are projected to be smaller than in most of the previous decade. Food and starch, other segments of FSI use, are mature markets and projected gains largely reflect population growth.

Projected exports demonstrate growth compared with the 1980s and 1990s, but remain below the record established in 1979/80 until the end of the forecast period. Initially, U.S. corn exports are expected to decline slightly, but grow thereafter.

Ending stocks of corn are expected to decline to 978 million bushels in 2011/12. Prices strengthen from recent lows to \$2.60 per bushel by the end of the projection period, as the stocks-to-use ratio progressively declines.

## **Sorghum**

Sorghum production is projected to grow to 640 million bushels by 2011. Plantings decline to 9.5 million acres in 2003 and then rise to 9.8 million acres by the end of the baseline. Trend yield growth of 0.6 bushels an acre per year is assumed. By 2008, sorghum yields exceed the current record of 72.7 bushels per acre.

Since growth in both supply and demand are about equal after 2006/07, ending stocks of sorghum are projected to remain about the same. Steady export gains are largely due to increased shipments to Mexico. Only modest increases in feed and residual use are projected. Food, seed, and industrial use rise slowly in the baseline, remaining record high due to sorghum's industrial use.

## **Barley**

Barley production increases modestly over the baseline, reaching 310 million bushels by 2011. Planted acreage remains steady over the period, as barley's net returns cannot compete for more area. Trend increases of 0.6 bushels per acre a year are assumed for barley yields.

In contrast to sorghum, the increase in barley supplies goes to feed and residual use. Food and industrial use, dominated by malt for beer brewing, is not expected to grow. Barley exports are projected at 30 million bushels each year in the baseline. Imports are expected to be constant at 35 million bushels. The average barley price is projected to rise through the baseline, reaching \$2.55 per bushel by 2011/12.

## **Oats**

A declining long-term trend in oat acreage is projected to bottom out, with oat plantings remaining constant at 4.4 million acres over the baseline period. The crop will remain important in some rotations and as a cover crop. Production is projected to range from 130 to 135 million bushels over the period, while total use starts at 225 million bushels, increasing to 264 million. Imports rise from 105 million bushels to 130 million, or 36 to 39 percent of supply, making up the difference between production and use. Imported oats are particularly important to food and specialty feed use. Food use grows very slowly reflecting population increases. Feed and residual use ranges from 155 million bushels to 185 million. Oat prices begin the projection period at low levels and increase to \$1.45 per bushel by 2011/12.

## **Wheat**

U.S. wheat supplies are projected to begin the baseline period at 2.9 billion bushels, down from recent high levels of more than 3.3 billion bushels attained in the late 1990s, and to rise to only 3.2 billion bushels at the end of the projections. Domestic wheat production is projected to

increase steadily throughout the projection period with yields rising at almost twice the rate of harvested area. Imports are projected to be 3 to 4 percent of total supplies over the projection period. The United States imports hard red spring, durum, and white wheat, mostly from Canada. Stocks rise slightly at the start of the projection period, partly due to lower exports, but stocks then decline for the remainder of the baseline.

As net returns rise over the projections period, additional acreage is attracted to wheat, although wheat acreage of 64 million acres at the end of the baseline is much less than the 75 million acres planted in 1996. Nonetheless, the projected rise in acreage reverses a downward trend from 1996. The Olympic average of harvested to planted acreage for 1997 to 2001 is used to determine harvested area throughout the projection period.

Total wheat consumption is anticipated to rise throughout the projection period. Both food use and exports are expected to rise each year, but feed use slowly decreases as wheat prices rise. Following a slowdown in the last half of the 1990s, food use of wheat is expected to increase 10 million bushels annually beginning in 2003/04. These gains are in line with growth in population, but are slower than growth from the early 1970s to the mid-1990s when changes in consumer preferences led to rapidly rising per capita consumption.

Exports account for a growing share of total U.S. wheat utilization, rising from 42 percent to 48 percent during the projection period. After initially declining, the U.S. share of global trade remains in a 24 to 26 percent range during the rest of the baseline, below levels of the late 1990s, as continued competition and a strong dollar limit U.S. wheat export growth. Key growth markets for global wheat imports include China, Pakistan, Brazil, North Africa, and the Middle East, reflecting rising incomes and populations and, in some markets, changes in policy. The United States faces continued competition from Australia, Canada, and the EU. Importantly, the EU can export wheat without subsidies throughout the projection period. Increased export competition also is seen to arise from Eastern Europe, Ukraine, and Russia. However, Argentina's wheat exports decline in the second half of the projections because other crops become more profitable to produce.

Wheat prices for U.S. producers are anticipated to decline slightly the first two years of the projection period, but rise steadily thereafter. Rising exports and domestic food use are expected to reduce ending stocks and the stocks-to-use ratio. Net returns per acre are expected to rise rapidly in 2004/05 and maintain this growth rate through the rest of the projection period, as rising revenues are projected to outpace increasing variable costs.

## **Rice**

U.S. rice plantings are projected to remain virtually flat at 3.25 million acres from 2002 through 2006, and then slowly decline to 3.2 million acres by the end of the projection period. The decline in rice area is expected to occur mostly in the Mississippi Delta where soybeans are typically rotated with rice. Little change is projected in California's rice acreage over the next decade, with Japan remaining its number one export market. Rice acreage in the Gulf Coast, the highest per-unit cost-of-production region of the United States, is projected to be steady over the next 10 years, as few economically viable alternative crops are available in the region. In 2002,

total U.S. rice acreage is projected to drop slightly, a result of extremely low prices and large carryover stocks.

Stable-to-declining rice acreage, accompanied by small but steady increases in yields, is expected to account for slowly rising production throughout the projection period. Rice yields are projected to grow about 0.5 percent annually due to better farm management practices and some improvements in rice varieties. This growth rate is less than achieved in the 1980s and early 1990s when modern high-yielding varieties were adopted. U.S. average rice yields typically jump 4 to 8 percent every 5 to 7 years as newer varieties are introduced.

U.S. rice imports are projected to expand about 2.5 percent annually over the baseline period, a rate of growth that is slower than during most of the 1980s and early 1990s, reaching a record 14 million-hundredweight by 2011/12. Imports as a share of total domestic use (including seed and residual) are expected to rise fractionally over the baseline period, reaching almost 10 percent by 2011/12. U.S. rice imports are predominantly premium, specialty varieties not currently grown in the United States, mostly Thai jasmine as well as smaller quantities of basmati from India and Pakistan.

Total domestic and residual use is projected to rise gradually throughout the projection period, gaining 2 percent a year. Food use is expected to account for virtually all of the growth in domestic use. The expansion in domestic food use is mostly attributed to a growing share of the U.S. population from Asia and Latin America, a greater emphasis on healthier life styles, versatility of rice as a side dish or main dish, and greater use of rice in processed foods and pet food. The rate of growth in domestic use has slowed since the 1980s and early 1990s due to a growing share of meals eaten away from home, an increasing popularity of precooked meals, a premium on minimal preparation time, competition from other side dishes at restaurants, and the growing popularity of meals that can be eaten on the run. Despite the slower rate of overall consumption growth, per capita rice use is projected to continue rising over the baseline period.

Brewers' use of rice, which has been virtually stagnant since the late 1980s, is projected to expand fractionally over the baseline period. Stronger growth is unlikely due to negligible gains in per capita beer consumption, greater popularity of light beers that use less rice than regular beers, and larger imports of beer. Seed use, a function of planted area, is expected to remain constant through 2006 before declining fractionally through 2011 as rice area slowly contracts.

U.S. rice exports are projected to slowly decline over most of the baseline period. However, in the first year of the baseline, exports are projected to increase 2 percent to 88 million hundredweight. Exports then remain nearly stable through 2004/05. The initially robust export outlook is the result of a declining price difference with Asian exporters' prices and record supplies at home. By 2005/06, U.S. exports are projected to slowly decline as domestic use outstrips production growth and the price difference with Asian exporters widens. The export share of total use is projected to drop from nearly 42 percent in 2002/03 to around 34 percent by 2011/12. The U.S. share of global rice exports is projected to decline from nearly 12 percent in 2002/03 to slightly more than 8 percent by 2011/12.

The United States exports mostly to high-quality markets, rarely competing with the low cost Asian exporters in lower quality milled rice markets. However, Thailand and India compete with the United States in certain high quality indica markets, primarily parboiled, in the Middle East and South Africa. China and Australia compete with the United States for japonica sales to Japan. Australia, Egypt and the EU also compete in the international japonica market, especially in the Eastern Mediterranean. Currently, 25 to 30 percent of U.S. rice exports are rough rice, mostly indica rice from the southern United States going to Latin America. Asian exporters do not export rough rice and ship very little rice to Latin America.

U.S. ending stocks are projected to slowly decline from more than 44 million hundredweight in 2003/04 to 31.4 million in 2011/12, as expanding total use outstrips supply. With total use expanding each year, the stocks-to-use ratio is projected to drop from a high of 20.5 percent in 2003/04 to less than 14 percent in 2011/12, nearly identical to the 1996/97 to 2000/01 average.

Global prices are expected to rise about 3 percent a year from recent low levels due to expanding world rice trade. Trade growth will be largely driven by population growth and some shifting to higher quality rice by importers as incomes rise. However, world prices are not projected to exceed U.S. loan rates during the 10-year baseline period, making U.S. producers eligible for marketing loan benefits throughout the projection period. Net returns for rice producers, including marketing loan benefits, are projected to decline from \$95 per acre in 2002/03 and 2003/04 to \$88 in 2007/08 and then slowly rise as higher farm prices more than offset declining marketing loan benefits.

### **Upland Cotton**

Planted area for upland cotton is expected to decline throughout the baseline period as cotton acreage is bid away to other crops, such as corn or soybeans. Area is projected at 15.1 million acres for 2002, a decline of nearly 1 million acres from the previous year because of more favorable returns to competing crops. Projected harvested area incorporates an average abandonment of 9 percent per year. Upland cotton yields are expected to increase 2 pounds per year, reaching 648 pounds per harvested acre by 2011, well below the 705-pound per acre record yield in 1994. Projected production declines from 18 to 17 million bales during the baseline period, as the reduction in planted area offsets the small rise in productivity.

Total disappearance of U.S. upland cotton is expected to expand modestly in the first two years of the baseline, as global consumption continues to expand to meet the rebounding demand for cotton textile and apparel products. Total use is projected to expand to more than 18 million bales, reaching its peak in 2003/04. For the remainder of the period, total consumption is expected to decline slightly as foreign competition limits U.S. offtake.

Upland cotton mill use is expected to remain in the 8.1 to 8.2 million bale range for the first several years of the baseline period as structural adjustments in the U.S. textile and apparel industry have reduced mill use by 3 million bales over the last three seasons. By 2005/06, the full phaseout of the Multi-Fiber Arrangement's textile and apparel import quotas are scheduled and the liberalization of restrictions on cotton textile and apparel import quotas will likely result in larger imports, primarily apparel, from developing countries with lower wages. Increases in



U.S. textile and apparel imports are projected to more than offset larger textile and apparel exports. As a result, U.S. upland mill use is projected to decline 1 to 2 percent per year beginning in 2005/06, declining to about 7.6 million bales by the end of the baseline.

Exports of upland cotton, on the other hand, are projected to climb to 10.5 million bales in 2003/04 as the U.S. farm program provides competitively priced cotton to the world. However, even with the aid of Step 2 payments, U.S. upland cotton exports decrease slightly each year after 2003/04 as foreign competition develops, but remain well above mill use. With world trade projected to expand throughout the baseline period, averaging 1 percent annually, the U.S. market share is projected to decline to 30 percent by 2011/12 after peaking at 37 percent in 2003/04.

Ending stocks are projected to fall throughout most of the baseline period from initially large levels as acreage and production respond to declines in use and rising production costs. As with stocks, the stocks-to-use ratio declines moderately from 47 percent in 2002/03 to around 35 percent by the end of the baseline period. Net returns for upland cotton are expected to be somewhat stable throughout the baseline period, in part due to marketing loan benefits, but remain below the relatively high levels of the 1996-98 seasons.

### **Soybeans**

Area planted to soybeans is anticipated to decline through the middle of the projection period and then rise to a record 76.3 million acres in 2011. The soybean loan rate is assumed to revert to the formula or minimum level set forth in the 1996 Farm Act. Although marketing loan benefits raise soybean net returns and acreage, reduced loan rates in the baseline and stronger returns for competing crops are seen curtailing soybean plantings between 2003 and 2005. During most of the first half of the projection period, a rise in soybean farm prices is expected to coincide with declining marketing loan benefits. Soybean acreage is expected to rise again beginning in 2006, as farm prices exceed the loan rate.

U.S. soybean yields are projected to have an annual trend growth of 0.5 bushels per acre. Continued improvements in soybean varieties are expected to contribute to the U.S. yield trend. Soybean production is expected to exceed 3.3 billion bushels on 75.3 million harvested acres by 2011. Growth in soybean yields and area begin to lag demand growth after 2002.

Increasing use for soybeans is expected to gradually reduce ending stocks throughout the projection period. Soybean prices are projected to rise slowly from a low of \$4.30 per bushel in 2001/02. For about the first four years of the baseline, marketing loan benefits are expected to supplement revenue from farm marketings, until 2006/07 when the soybean price substantially exceeds the loan rate. U.S. farm prices are projected to rise to \$6.20 per bushel by the end of the baseline period, as soybean supplies come into closer balance with demand. By 2011, soybean net returns per acre are expected to approach but not match the \$196 level of 1996/97.

U.S. soybean exports are projected to increase to a record 1.04 billion bushels by 2003/04 as low world market prices initially are anticipated to slow foreign soybean production somewhat and support import growth. Consequently, the United States is expected to capture a slightly larger

share of the world soybean market. But as prices begin to firm thereafter, the expansion of foreign soybean output is expected to strengthen, with the competition slowing the growth of U.S. soybean exports.

The pace of U.S. crush is partly determined by demand for world soybean meal and the rate of foreign crushing. Ample soybean supplies and low prices are expected to accelerate domestic crushing in 2002/03 and 2003/04. Subsequently, as foreign supplies increase, annual increases in crushing are expected to moderate and slightly exceed 2 billion bushels by 2011/12. The average price for soybean meal is projected to decline to \$152.50 per short ton by 2003/04, which should support domestic consumption and keep U.S. soybean meal exports competitive. Beginning in 2004/05, U.S. soybean meal prices are anticipated to strengthen modestly, because of a slowing growth in supply and a continuing growth in demand for domestic soybean meal, supported in part by rising pork and poultry production. Thereafter, growth in U.S. soybean meal exports slows, because of tightening domestic soybean supplies and a revival in foreign meal output, but is expected to reach 8.6 million short tons by 2011/12.

Recent soybean prices have been pressured by the lowest soybean oil values since 1971. But, as consumption converges with supply and gradually reduces ending stocks, a modest recovery in U.S. soybean oil prices is projected. Prices are projected to increase from 16.3 cents per pound in 2002/03 to 25.0 cents by 2011/12. Domestic disappearance of soybean oil is expected to rise at a relatively steady rate, reaching 20.3 billion pounds by 2011/12. U.S. soybean oil exports are projected to grow to 2.8 billion pounds by 2011/12. The pace of U.S. soybean oil exports is projected to grow slowly throughout the baseline period, as domestic prices rise and world palm oil production expands.

## **Sugar**

The USDA sugar baseline assumes a continuation of current U.S. sugar policy through the end of the projections period in fiscal year (FY) 2012. The main components of the U.S. sugar program are the price support loan program and the tariff-rate quota (TRQ) import system. The loan program supports prices of domestically produced sugar. The TRQ system helps support domestic sugar prices by restricting imports of sugar. U.S. commitments under international trade agreements, including the World Trade Organization (WTO) and the North American Free Trade Agreement (NAFTA), affect the level and allocation of the TRQs throughout the baseline. NAFTA provisions also affect imports of high-tier tariff sugar outside the TRQ system.

U.S. sugar policy is carried out in the context of additional assumptions about trends that affect the production and consumption of U.S. sugar. These include assumptions about technology and the prices of crops that substitute for sugarcane and sugarbeets. In addition, factors affecting Mexican sugar supply and demand influence the U.S. sugar projections.

### **U.S. Sugar Loan Program**

The 1996 Farm Act and subsequent amending legislation provide for the USDA to make nonrecourse loans available to processors of domestically grown sugarcane at a rate of 18 cents per pound and to processors of domestically grown sugarbeets at a rate of 22.9 cents per pound

for refined beet sugar. With a nonrecourse loan, the USDA must accept sugar pledged as collateral for the loan as full payment in lieu of cash repayment of the loan, at the discretion of the processor. Also, the 1996 Farm Act required that processors who forfeit sugar pledged as collateral for a nonrecourse loan pay a penalty of 1 cent a pound for raw cane sugar and 1.072 cents a pound for refined beet sugar. Processors consider these penalties when deciding whether to forfeit sugar to the Commodity Credit Corporation (CCC). For the sugar baseline, the minimum raw sugar market price to discourage forfeitures is calculated at 19.68 cents a pound, while the corresponding minimum refined beet sugar price is calculated at 24.45 cents a pound.

### **Sugar Tariff-Rate Quota**

In the Uruguay Round of the General Agreement on Tariffs and Trade (GATT), the United States agreed to import a minimum quantity of raw and refined sugar of 1.256 million short tons, raw value (STRV) each marketing year (October/September). Included in this amount is a commitment to import at least 24,251 STRV of refined sugar. These commitments became binding under the World Trade Organization (WTO) when it replaced the GATT.

The raw cane sugar TRQ is allocated to 40 quota-holding countries based on a representative period (1975-81) when trade was relatively unrestricted. An additional quantity of sugar is made available to Mexico to satisfy U.S. obligations under the NAFTA. The USDA sugar baseline assumes that the raw sugar TRQ less the NAFTA commitment to Mexico is set at the minimum access level of 1.231 million STRV throughout the projection period. Based on historical performance, it is assumed that some quota-holding countries will be unable to fulfill their assigned quota, with the aggregate shortfall totaling 65,000 STRV. The WTO minimum access for refined sugar TRQ is 24,251 STRV. It is expected that the refined sugar TRQ will be set higher than the minimum, consistent with the recent historical pattern that has allowed additional specialty sugar to be imported at a low duty within the TRQ. Therefore, the yearly refined sugar TRQ for the baseline period is assumed to be set at 37,478 STRV, the same level as for FY 2002.

### **North American Free Trade Agreement**

***Low-tier Tariff NAFTA Imports.*** According to the NAFTA, Mexican sugar low-tier tariff exports to the United States are restricted by Mexico's net surplus production of sugar. The net surplus is defined as Mexico's production of sugar less its consumption of sugar and high fructose corn syrup (HFCS). From FY 2001 through 2007, Mexico is to have duty-free access to the U.S. market for the amount of its surplus as measured by the formula, up to a maximum of 250,000 metric tons, raw value (MTRV). Beginning in FY 2008, Mexico is to have duty-free access with no quantitative limit. The sugar baseline projects that Mexico will achieve net surplus producer status through 2007, but the surplus is expected to be less than 250,000 MTRV in each year.

***High-tier Tariff NAFTA Imports.*** The NAFTA specifies a declining high-tier tariff schedule for raw and refined sugar over the transition period to duty-free sugar trade in 2008. For calendar year 2002 the raw sugar tariff is 9.07 cents a pound, and the refined sugar tariff is 9.61 cents a pound. The raw sugar tariff drops about 1.5 cents each year, and the refined sugar tariff drops about 1.6 cents a year. Both rates reach zero in 2008.

The economic incentive for Mexico to export high-tier tariff raw sugar exists if a price threshold is less than or equal to the U.S. sugar price. The threshold is equal to the sum of the world price of sugar (No. 11 New York contract), the high-tier NAFTA tariff rate, unit marketing costs (about 1.1 cents a pound for raw sugar), plus marketing premiums (assumed to be about \$30 a metric ton, or 1.36 cents a pound). The threshold price is compared to the U.S. price for entry in Gulf ports. This U.S. price runs about 1 cent lower than the No. 14 New York contract price. If the threshold is below the U.S. Gulf price, then Mexico would be encouraged to export sugar to the United States up to that point where the marginal returns from exporting to the U.S. and the world markets are equalized.

The sugar baseline assumes that the world price of sugar will average about 7 cents a pound through 2003, rise to 8 cents a pound in 2004, and then average 9 cents a pound through the remainder of the projections. U.S. sugar processors are expected to use the sugar loan program to keep the U.S. raw sugar price at or above 19.68 cents a pound, with a sufficient level of loan program forfeiture (that removes sugar from the market) to keep prices from falling lower.

Under the foregoing assumptions, significant high-tier tariff imports from Mexico are expected, beginning in FY 2003. Yearly imports through 2007 are projected to be between 540,000 and 620,000 STRV. These projections are made on the assumption that Mexico will keep its countervailing duties on HFCS imports from the United States. These duties limit inroads that HFCS could otherwise make in substituting for sugar in Mexico's beverage and food processing industries. If these duties were reduced or removed completely, it is likely that high-tier sugar imports from Mexico would be much higher as the HFCS substitution would result in additional exportable sugar supplies in Mexico.

Another factor encouraging high-tier tariff imports is the U.S. sugar loan program. Under the assumptions discussed above, the CCC acquires sugar that it holds off the market in order to keep raw and refined sugar prices at the minimums necessary to forestall additional forfeitures. Because the sugar loan program keeps high-tier tariff imports from depressing U.S. sugar prices below the support level, and given a world sugar price between 7 and 9 cents a pound, Mexico is encouraged to ship all exportable sugar to the United States.

After 2007, the high-tier tariff is zero, and Mexican duty-free exports are no longer limited by calculations of net surplus production. It is expected that Mexican prices will be at parity with U.S. sugar prices, which in turn will be supported by CCC stock acquisitions. Higher Mexican prices encourage Mexican production, and encourage substitution toward HFCS because its price relative to Mexican sugar prices is now lower. In 2012, Mexican sugar exports to the United States are projected to be above 1.3 million STRV.

### **U.S. Sugar Production and Sugar Crop Prices**

Trend improvements in sugarcane and sugarbeet growing, harvesting, and processing are expected to continue through the projections period. These improvements are captured in the baseline by sugar produced per acre. The average sugar yield for sugarcane-producing States is projected at 4.37 tons per acre in 2003, and is expected to grow yearly at about 0.6 percent, projected to reach 4.61 tons per acre in 2012. The U.S. sugarbeet yield is projected at 3.14 tons

per acre in 2003, and is expected to grow yearly at about 0.7 percent. In 2012, it is projected at 3.35 tons per acre.

Nominal sugar and sugar crop prices are expected to be at or above levels consistent with current sugar loan rates and forfeiture penalties. Sugarbeet price projections range from a low of about \$38.15 per ton between 2004 to 2007 to above \$41.00 per ton after 2010. Sugarcane prices range from a low of \$25.37 in 2006 to above \$28.00 per ton after 2010. Prices of alternative crops are projected to rebound from the very low levels of 2001. Prices for alternative crops in sugarbeet areas are projected to increase 35 percent between 2001 and 2012, and prices for alternative crops in sugarcane areas are projected to increase 30 percent over the same period.

Producer net returns reflect declining prices of U.S. sugar crops relative to prices for competing crops and result in small reductions in area planted and harvested for sugar crops. For sugarbeets, area planted is expected to slowly decline from 1.44 million acres in 2003 to 1.40 million acres in 2012. For sugarcane, area harvested is expected to reach a high of 1.01 million acres in 2004 but decline to about 950,000 acres after 2006. In spite of reduced acreage, technical improvements reflected in higher sugar yields imply that U.S. sugar production will be fairly constant over the projections period. Beet sugar production is projected to be between 4.4 to 4.6 million STRV, while cane sugar production is projected to be between 4.3 to 4.4 million STRV.

### **U.S. Sugar Consumption and Ending Stocks**

Domestic deliveries are expected to increase 135,000 STRV each year. Consistent with historical trend, delivery growth for industrial uses is expected to be greater than growth for nonindustrial (including household) uses. Although sugar demand by industrial users may be somewhat price-elastic within certain price ranges, wholesale sugar prices are expected to be steady due to support provided by the loan program. Prices of alternative sweeteners, mainly HFCS-42 and HFCS-55, are not expected to be sufficiently high to warrant substitution of sugar for those products.

Ending stocks are projected to grow from 1.5 million STRV in 2002 to over 2.1 million STRV in 2005, and then decline to 1.2 million STRV in 2012. The projected ending stocks-to-use ratio rises above 18.5 percent in the period between 2004 and 2006, but declines to 10.2 percent at the end of the projections. The CCC is projected to own significant sugar stocks during FY 2004 through 2006.

### **Sensitivity to Developments in Mexico**

U.S. sugar baseline projections are very sensitive to sugar industry developments in Mexico. Mexican sugarcane area harvested is not expected to grow outside the range of 630,000 to 640,000 hectares prior to 2009. After 2008, area is expected to grow to 656,000 hectares by 2012. Sugarcane yields are expected to be about 72 tons per hectare, with little growth expected. Any upward adjustments to these expectations would result in increased exports to the U.S. market. Also, significant substitution of HFCS for liquid sugar in the production of Mexican soft drinks would swell the amount of the Mexican exportable sugar surplus, resulting in much larger U.S. sugar stocks and lower prices.

## High-tier Tariff Sugar Imports from Mexico—An Alternative Scenario

The U.S. sugar baseline projects the entry of 545,000 STRV of sugar from Mexico, imported at the high-tier tariff in FY 2003, with higher levels in subsequent years. The economic incentive for Mexico to export high-tier tariff sugar to the United States exists if the pricing threshold is less than or equal to the U.S. sugar price. The threshold is defined as the sum of the world price of sugar (No. 11 New York contract), the high-tier NAFTA tariff rate, and unit marketing costs, premiums, and locational discounts. The high-tier tariff in 2003 is 7.56 cents per pound. The sum of marketing margins, premiums, and locational discounts used in the baseline is 3.46 cents per pound. With a projected world price of 7 cents a pound, the threshold price equals 18.02 cents a pound. Because the threshold is below the minimum raw sugar price to avoid forfeitures (19.68 cents a pound), Mexico is encouraged to ship its entire exportable surplus to the United States rather than third-party destinations at the world price.

It may be argued that Mexico is exporting its sugar below its cost of producing it. For example, if Mexican sugar is sold at 19.68 cents, subtracting out the tariff and all margins would leave a return of 8.66 cents a pound. If the cost of producing Mexican sugar is higher, one might argue that Mexico is exporting sugar into the U.S. market with a subsidy. An argument for an anti-dumping or countervailing duty investigation could be made.

As a modeling experiment, an additional scenario to the baseline is presented to illustrate the effect if the implied export subsidy were eliminated. An estimate of the Mexican cost of producing sugar is used in place of the world price in setting the threshold pricing level. This substitution results in a higher threshold price level that is compared with the U.S. sugar price. The accompanying table shows scenario results for selected variables, along with corresponding results from the baseline.

The most notable effect is that large high-tier tariff imports from Mexico do not occur until FY 2005, compared with FY 2003 in the baseline. Ending sugar stock levels are projected much lower during FY 2003 through FY 2008, down an average of 476,000 STRV per year. In FY 2004, ending stocks are about 850,000 tons less than in the baseline. The ending stocks-to-use ratio in FY 2004 is 10.9 percent, compared with 18.9 percent in the baseline. During FY 2003 through 2008, U.S. raw sugar prices (not shown) average about 1.9 cents per pound higher than in the baseline. Higher sugar prices imply higher U.S. sugar production. The average yearly production level during 2004 and 2008 is higher than in the baseline by 185,000 STRV. In contrast to the baseline, there are no loan rate forfeitures in this alternative scenario.

Sugar alternative scenario results, selected variables

Item and Scenario	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<i>Thousand short tons</i>											
High-tier tariff NAFTA imports											
Baseline	25	545	576	590	604	621	786	1,101	1,114	1,222	1,329
Alternative	25	0	83	587	604	621	787	1,195	1,003	1,175	1,275
U.S. sugar production											
Baseline	8,345	8,814	8,713	8,763	8,772	8,765	8,766	8,817	8,854	8,905	8,960
Alternative	8,345	8,814	8,884	8,997	8,963	8,931	8,929	8,944	8,917	8,960	9,009
U.S. ending stocks											
Baseline	1,496	1,876	2,038	2,112	2,059	1,863	1,585	1,538	1,405	1,295	1,213
Alternative	1,496	1,331	1,174	1,482	1,621	1,594	1,479	1,652	1,472	1,371	1,283
Ending stocks-to-use ratio											
Baseline	14.1	17.6	18.9	19.3	18.6	16.6	14.0	13.4	12.1	11.0	10.2
Alternative	14.1	12.5	10.9	13.5	14.6	14.2	13.0	14.4	12.7	11.7	10.8

Source: USDA/Economic Research Service.

## **Tobacco**

Tobacco leaf grown in the United States is primarily used for domestic manufacture of cigarettes and for exports for cigarette production in other countries. As U.S. cigarette output has shrunk in recent years, manufacturers have needed less leaf. Furthermore, use of imported leaf has increased, displacing some domestic leaf. Purchase intentions plummeted through the end of the 1990s but have stabilized, loan stocks are lower because of a loan forgiveness program for 1999 leaf, and exports have stabilized. As a result, after lower marketing quotas for flue-cured and burley tobacco in 1999 and 2000, quotas increased in 2001. In 2002, flue-cured quotas will likely continue increasing but burley quotas will fall as stocks are built up. After the turbulent 1990s, short-run demand for U.S. tobacco has stabilized. However, the long-term trend remains unchanged: reduction in leaf use is likely to continue. Cigarette output is expected to continue its decline of 2 to 3 percent a year as expenses associated with litigation and settlement push prices up. On January 1, 2002, Federal excise taxes on cigarettes increased 5 cents per pack, putting additional pressure on prices. Numerous States increased their taxes in 2001.

Stocks of both flue-cured and burley tobacco are nearly 320 million pounds lower because of the loan forgiveness of 1999 tobacco held by cooperatives. This, along with stable exports, had a positive impact on quotas. Although flue-cured purchase intentions increased and burley fell, the bulk of the loan forgiveness stocks were burley and the net effect was higher quotas for both in 2001. Marketing quotas for flue-cured and burley are set by totaling (1) intended purchases by domestic cigarette manufacturers from the previous crop; (2) average exports for the most recent 3 marketing years; and (3) an adjustment to maintain loan stocks at the specified reserve-stock level of 15 percent of basic quota, or a minimum of 100 million pounds of flue-cured or 50 million pounds of burley. This amount may be adjusted up or down by a maximum of 3 percent by the Secretary of Agriculture. The resulting "basic" quota is then adjusted by carrying forward over-marketings and under-marketings from previous years for each individual quota holder. This "effective" quota is the amount growers are allowed to market in a given season.

Cigarette consumption is likely to continue declining for the next decade, further eroding demand for leaf. Although the percentage of the U.S. adult population that smokes has been fairly stable at about 24 percent, cigarette use per person among smokers has fallen, underlying part of the overall decline in domestic tobacco use. Projections assume declines in both the percentage of the U.S. population that smokes and per-person cigarette use among U.S. smokers.

Quotas will continue to fall. Imports are expected to increase annually after a period of stability. Export markets for both flue-cured and for burley are expected to tighten as quality and competitiveness of foreign-produced tobacco gains and global cigarette consumption falls.

Tobacco yields remain constant throughout the baseline. Poundage quotas reduce incentives to raise production per acre. Prices for U.S.-grown tobacco rise in correspondence with increases in the support price, which is based in part on changes in production costs.

## Horticulture

The farm value of U.S. horticultural production is projected to reach \$42 billion in 2002, up 4 percent from 2001 and 8 percent above 2000. Production value gains are expected in most horticultural industries, primarily resulting from increased production. During 2001, the 4-percent increase in U.S. horticultural crop value was due mainly to higher prices for many non-citrus fruits, fresh vegetables, potatoes, and pulses. The value of horticultural production is projected to increase \$1.1 to \$1.7 billion annually during 2003-2011, an average annual growth rate of about 3 percent.

Exports continue to be crucial to the success of the U.S. horticultural sector, accounting for about 22 percent of annual total crop value since the mid-1990s. On average, export sales are projected to continue generating about 22 percent of U.S. horticultural production value during 2002-2011. The value of U.S. horticultural exports is projected to increase about 3.0 percent per year from fiscal year 2001 to fiscal year 2011, reaching about \$14.8 billion by the end of the baseline. Leading export crops (including both fresh and processed products) for fruit and nuts are grapes, almonds, and oranges, and for vegetables are potatoes, tomatoes, and dry beans. However, the United States will remain a net importer of horticultural products, with the trade gap widening slightly. Total import value is expected to increase an average of 3.4 percent annually throughout the baseline, which would put import value at \$23 billion in 2011. Leading import crops (including both fresh and processed products) for fruit and nuts are grapes, bananas, and cashews, and for vegetables are tomatoes, potatoes, and peppers.

Potato production for 2001 is forecast down 12 percent from the record crop of a year earlier. Reduced U.S. production was accompanied by reductions in Canadian and European potato production in the fall of 2001. As a result, U.S. potato prices are expected to be up significantly for the 2001 crop. Additionally, with reduced supplies of potatoes in the world, U.S. exports of potatoes and potato products may increase by 4 to 10 percent in 2002. During 2003-2011, exports are expected to increase by about 4 to 5 percent annually. Domestic demand for potatoes and potato products is expected to increase by just over 2 percent annually from 2003-2011, while domestic production is expected to increase an average of nearly 3 percent a year. Even though domestic production and exports are expected to continue increasing, imports of frozen French fries from Canada, which have grown by more than 11-fold since 1989, are also expected to exhibit continued growth for the remainder of the decade.

Domestic demand for other fresh-market vegetables is expected to increase an average of 2.6 percent annually during 2002-2011. Per capita consumption is projected to increase about 1.7 percent a year, while annual population growth is projected at slightly less than 1 percent. Consumer awareness of the importance of fresh produce in a healthy diet and increasing product diversity and availability boost domestic consumption in the projections. During this 10-year period, U.S. production of fresh vegetables is expected to increase an average 2.3 percent per year. Exports should continue to increase, but will likely be outpaced by imports. Imports will continue to play an important role in the domestic supply of fresh vegetables during the winter months and, increasingly, during other times of the year.



Fruit and nut production in 2002 is expected to increase by 3.2 percent from 2001, with non-citrus fruits slightly outpacing citrus fruits. For the remainder of the baseline period (2003-2011), however, fruit and nut production is expected to increase an average of 1 percent per year. Citrus and non-citrus production are each expected to grow at an average of about 1 percent a year, with production of nuts growing an average of about 2 percent a year. On the demand side, domestic per capita consumption of fruit and nuts is expected to increase by less than 1 percent per year. In contrast to the relatively slow projected growth rates for domestic fruit production and consumption, trade in fruit and nuts is expected to increase. As consumers worldwide become increasingly accustomed to year-round availability of fresh produce, as well as produce not produced domestically, international trade in these products will increase. U.S. fruit and nut exports are projected to increase about 3 percent annually during 2002-2011, while imports are expected to increase slightly more than 3 percent annually. The United States will remain a net importer of fresh fruit through 2011.

Domestic use of fruit and vegetables for processing (excluding potatoes, sweet potatoes, pulses, and mushrooms) is projected to increase during 2002-2011 by an average of 1 percent a year, with processed fruit consumption gaining at a slightly faster pace than processed vegetables. The processed fruit category includes juices and wine, which account for a little over 50 percent of total fruit production. Processed fruit and vegetable exports are likely to continue to increase between 3 and 5 percent annually for the next decade. Export potential for virtually all processed fruit and vegetable categories looks promising, with perhaps the strongest growth occurring in wine exports.

Table 4. Production flexibility contract payments under the 1996 Farm Act, crop years

Table 4. Production flexibility contract payments under the 1996 Farm Act, crop years								
Commodity	Commodity share	1996	1997	1998	1999	2000	2001	2002
Percent		Million dollars						
<b>1996 Farm Act gross contract payments</b>								
Wheat	26.26	1,463	1,414	1,523	1,471	1,347	1,085	1,053
Corn	46.22	2,574	2,489	2,681	2,590	2,371	1,909	1,852
Sorghum	5.11	285	275	296	286	262	211	205
Barley	2.16	120	116	125	121	111	89	87
Oats	0.15	8	8	9	8	8	6	6
Upland cotton	11.63	648	626	675	652	597	480	466
Rice	8.47	472	456	491	475	435	350	339
Total payments, unadjusted		5,570	5,385	5,800	5,603	5,130	4,130	4,008
<b>Adjusted contract payments, before payment limitations<sup>1</sup></b>								
Wheat		1,976	1,426	1,534	1,483	1,362	1,096	1,060
Corn		1,771	3,434	2,694	2,603	2,389	1,925	1,861
Sorghum		206	347	298	288	265	214	206
Barley		141	117	126	122	112	91	88
Oats		9	8	9	8	8	6	6
Upland cotton		746	639	689	665	616	501	478
Rice <sup>2</sup>		472	461	498	480	442	357	348
Total adjusted payments		5,321	6,433	5,847	5,650	5,195	4,190	4,047
<b>Contract payments after payment limitations and other adjustments (crop year basis)</b>								
Wheat		1,940	1,397	1,496	1,446	1,338	1,087	1,041
Corn		1,745	3,384	2,633	2,546	2,351	1,915	1,833
Sorghum		201	338	287	277	257	211	202
Barley		137	113	120	115	107	89	85
Oats		9	8	9	8	8	6	6
Upland cotton		699	597	637	614	575	482	452
Rice		455	448	478	466	433	355	343
Total payments		5,186	6,285	5,659	5,471	5,068	4,144	3,962

1/ Adjusted for prior-year earned deficiency payments paid in these years, repayments of unearned 1995 deficiency payments, and repayments of prior-year PFC payments, and other adjustments. These adjusted contract payments are used for payment rate calculations.

2/ 1996 Farm Act includes additional rice payments of \$8.5 million annually, FY 1997 through FY 2002.

Note: FY-1999 appropriations for agriculture provided \$3.057 billion for market loss assistance, with \$2.857 billion paid to farmers eligible for production flexibility payments in the previous year. FY-2000 appropriations for agriculture provided \$5.544 billion for market loss assistance paid to farmers eligible for production flexibility payments in the previous year. The Agricultural Risk Protection Act of 2000 provided \$5.465 billion for market loss assistance payments to be paid in September 2000 to farmers who were eligible for PFC payments in fiscal 2000. The Crop Year 2001 Agricultural Economic Assistance Act provided \$4.622 billion in market loss assistance payments for farmers who were eligible for PFC payments in fiscal 2001.

Table 5. Summary baseline policy variables

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
<b>Marketing assistance loan rates</b>												
	<i>Dollars<sup>1</sup></i>											
Corn	1.89	1.89	1.67	1.67	1.72	1.81	1.85	1.89	1.89	1.89	1.89	1.89
Sorghum	1.71	1.71	1.54	1.55	1.63	1.72	1.72	1.74	1.73	1.73	1.73	1.74
Barley	1.62	1.65	1.42	1.43	1.51	1.56	1.57	1.61	1.60	1.59	1.59	1.59
Oats	1.16	1.21	1.02	0.97	1.00	1.05	1.07	1.08	1.10	1.10	1.09	1.09
Wheat	2.58	2.58	2.30	2.27	2.30	2.36	2.40	2.42	2.49	2.58	2.58	2.58
Rice	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50
Upland cotton	0.5192	0.5192	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000
Soybeans	5.26	5.26	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	5.03
<b>Production flexibility contract payment rates</b>												
Corn	0.33	0.27	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Sorghum	0.40	0.32	0.31	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Barley	0.25	0.21	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Oats	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Wheat	0.59	0.47	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Rice	2.60	2.10	2.05	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06
Upland cotton	0.073	0.060	0.057	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058

1/ Units are dollars per bushel except for upland cotton (per pound) and rice (per hundredweight).

Table 6. Conservation Reserve Program acreage assumptions

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<i>Million acres</i>												
<b>Crop allocation<sup>1</sup></b>												
Corn	4.7	4.9	5.0	5.1	5.2	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Sorghum	0.9	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Barley	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Oats	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Wheat	7.0	7.2	7.4	7.5	7.7	7.8	7.8	7.8	7.8	7.8	7.8	7.8
Upland cotton	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Soybeans	4.1	4.7	4.8	4.9	5.0	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Subtotal	19.2	20.5	20.8	21.2	21.9	22.2	22.2	22.2	22.2	22.2	22.2	22.2
Other	12.2	13.2	13.4	13.6	14.1	14.2	14.2	14.2	14.2	14.2	14.2	14.2
Total	31.4	33.7	34.2	34.9	35.9	36.4	36.4	36.4	36.4	36.4	36.4	36.4

1/ The allocation of the CRP to specific crops for 2000 and 2001 reflects plantings for those years. Crop-specific allocations for 2002-2011 are based on the 2001 allocations. These allocations provide general indicators of the influence of the CRP on land available for plantings.

Table 7. Planted and harvested acreage for major field crops, baseline projections

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<i>Million acres</i>												
<b>Planted acreage, 8 major crops</b>												
Corn	79.5	76.0	77.5	77.5	78.5	79.0	79.5	79.0	79.5	79.5	80.0	80.0
Sorghum	9.2	10.0	9.8	9.5	9.6	9.6	9.6	9.6	9.7	9.7	9.8	9.8
Barley	5.9	5.0	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Oats	4.5	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Wheat	62.6	59.6	61.0	61.0	61.0	61.5	62.0	62.0	63.0	63.5	64.0	64.0
Rice	3.1	3.3	3.3	3.3	3.3	3.3	3.3	3.2	3.2	3.2	3.2	3.2
Upland cotton	15.3	16.0	15.1	14.8	14.7	14.6	14.5	14.3	14.1	14.0	13.9	13.8
Soybeans	74.3	75.2	75.5	74.5	74.0	73.8	74.3	75.0	75.5	75.8	76.0	76.3
Total	254.4	249.5	251.8	250.2	250.7	251.4	252.8	252.7	254.6	255.3	256.5	256.7
<b>Harvested acreage, 8 major crops</b>												
Corn	72.7	69.2	70.7	70.7	71.7	72.2	72.7	72.2	72.7	72.7	73.2	73.2
Sorghum	7.7	8.8	8.6	8.3	8.4	8.4	8.4	8.4	8.5	8.5	8.6	8.6
Barley	5.2	4.3	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Oats	2.3	1.9	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Wheat	53.1	48.7	52.8	52.8	52.8	53.3	53.7	53.7	54.6	55.0	55.4	55.4
Rice	3.0	3.3	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Upland cotton	12.9	13.9	13.7	13.5	13.4	13.3	13.2	13.0	12.8	12.7	12.6	12.6
Soybeans	72.4	74.1	74.5	73.5	73.0	72.8	73.3	74.0	74.5	74.8	75.0	75.3
Total	229.3	224.2	230.2	228.7	229.2	229.9	231.2	231.2	233.0	233.6	234.7	235.0

Table 8. Selected supply, use, and price variables for major field crops, baseline projections

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
<b>Yields<sup>1</sup></b>												
Corn	137.1	136.3	137.7	139.4	141.1	142.8	144.5	146.2	147.9	149.6	151.3	153.0
Sorghum	60.9	61.0	69.1	69.7	70.3	70.9	71.5	72.1	72.7	73.3	73.9	74.5
Barley	61.1	58.2	62.1	62.7	63.3	63.9	64.5	65.1	65.7	66.3	66.9	67.5
Oats	64.2	61.3	61.1	61.5	61.9	62.3	62.7	63.1	63.5	63.9	64.3	64.7
Wheat	42.0	40.2	41.5	41.9	42.3	42.7	43.1	43.5	43.9	44.3	44.7	45.1
Rice	6,281	6,328	6,300	6,332	6,363	6,395	6,427	6,460	6,493	6,527	6,560	6,594
Upland cotton	626	672	630	632	634	636	638	640	642	644	646	648
Soybeans	38.1	39.2	39.5	40.0	40.5	41.0	41.5	42.0	42.5	43.0	43.5	44.0
<b>Production<sup>2</sup></b>												
Corn	9,968	9,430	9,735	9,855	10,115	10,310	10,505	10,555	10,750	10,875	11,075	11,200
Sorghum	470	536	595	580	590	595	600	605	620	625	635	640
Barley	319	250	285	290	290	295	295	300	300	305	310	310
Oats	150	117	130	130	130	130	130	135	135	135	135	135
Wheat	2,232	1,958	2,190	2,210	2,235	2,275	2,315	2,335	2,395	2,435	2,475	2,500
Rice	190.9	208.2	203.0	204.1	205.1	206.2	207.2	207.6	208.0	208.5	208.9	209.3
Upland cotton	16,799	19,457	18,000	17,800	17,700	17,600	17,500	17,300	17,100	17,000	17,000	17,000
Soybeans	2,758	2,907	2,945	2,940	2,955	2,985	3,040	3,110	3,165	3,215	3,265	3,310
<b>Exports<sup>2</sup></b>												
Corn	1,940	2,050	1,925	1,950	2,000	2,050	2,100	2,175	2,275	2,325	2,375	2,425
Sorghum	240	240	250	250	255	255	260	265	270	275	285	290
Barley	58	30	30	30	30	30	30	30	30	30	30	30
Oats	2	2	2	2	2	2	2	2	2	2	2	2
Wheat	1,061	1,025	950	975	1,025	1,075	1,100	1,150	1,200	1,225	1,250	1,275
Rice	83.2	86.0	88.0	88.0	88.0	87.0	86.0	85.0	84.0	82.0	80.0	78.0
Upland cotton	6,326	8,540	10,000	10,500	10,000	9,900	9,800	9,700	9,600	9,500	9,400	9,300
Soybeans	1,000	980	1,010	1,040	1,050	1,060	1,070	1,080	1,090	1,100	1,110	1,120
Soybean meal	7,575	7,400	7,550	7,750	7,900	8,000	8,100	8,200	8,300	8,400	8,500	8,600
<b>Ending stocks<sup>2</sup></b>												
Corn	1,899	1,458	1,428	1,298	1,228	1,193	1,218	1,133	1,053	988	988	978
Sorghum	42	53	83	83	83	88	88	88	88	88	88	88
Barley	106	84	92	105	113	121	119	122	120	118	121	119
Oats	73	55	65	69	67	69	65	70	69	72	69	70
Wheat	876	652	674	691	677	672	672	656	639	627	620	602
Rice	28.4	40.6	42.9	44.1	44.0	43.8	43.2	41.7	39.1	36.7	34.1	31.4
Upland cotton	5,881	8,614	8,500	7,600	7,100	6,750	6,550	6,350	6,150	6,000	6,000	6,150
Soybeans	248	345	415	410	375	320	275	255	240	230	225	220
<b>Prices<sup>3</sup></b>												
Corn	1.85	2.10	2.10	2.20	2.25	2.30	2.30	2.40	2.45	2.55	2.55	2.60
Sorghum	1.88	2.05	1.95	2.05	2.05	2.10	2.10	2.20	2.25	2.35	2.35	2.40
Barley	2.11	2.25	2.25	2.35	2.35	2.40	2.40	2.45	2.50	2.55	2.55	2.55
Oats	1.10	1.30	1.20	1.25	1.30	1.35	1.35	1.40	1.40	1.45	1.45	1.45
Wheat	2.62	2.85	2.75	2.75	2.85	2.95	3.00	3.15	3.25	3.35	3.40	3.50
Rice	5.56	4.25	4.30	4.40	4.53	4.67	4.81	4.97	5.18	5.39	5.62	5.88
Soybeans	4.55	4.30	4.35	4.50	4.75	5.10	5.45	5.75	5.90	6.10	6.15	6.20
Soybean oil	0.142	0.155	0.163	0.178	0.193	0.208	0.220	0.228	0.235	0.240	0.245	0.250
Soybean meal	173.6	155.0	155.0	152.5	154.0	161.0	168.5	177.0	179.0	185.0	185.0	185.0

1/ Bushels per acre except for upland cotton and rice (pounds per acre).

2/ Million bushels except for upland cotton (thousand bales), rice (million hundredweight), and soybean meal (thousand tons).

3/ Dollars per bushel except for soybean oil (per pound), rice (per hundredweight), and soybean meal (per ton).

Table 9. Corn baseline

Item	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Acreage (million acres):												
Planted acres	79.5	76.0	77.5	77.5	78.5	79.0	79.5	79.0	79.5	79.5	80.0	80.0
Harvested acres	72.7	69.2	70.7	70.7	71.7	72.2	72.7	72.2	72.7	72.7	73.2	73.2
Yields (bushels per acre):												
Yield/harvested acre	137.1	136.3	137.7	139.4	141.1	142.8	144.5	146.2	147.9	149.6	151.3	153.0
Supply and use (million bushels):												
Beginning stocks	1,718	1,899	1,458	1,428	1,298	1,228	1,193	1,218	1,133	1,053	988	988
Production	9,968	9,430	9,735	9,855	10,115	10,310	10,505	10,555	10,750	10,875	11,075	11,200
Imports	7	10	10	10	10	10	10	10	10	10	10	10
Supply	11,693	11,338	11,203	11,293	11,423	11,548	11,708	11,783	11,893	11,938	12,073	12,198
Feed & residual	5,887	5,800	5,700	5,775	5,850	5,925	5,975	6,025	6,075	6,100	6,150	6,200
Food, seed, & industrial	1,967	2,030	2,150	2,270	2,345	2,380	2,415	2,450	2,490	2,525	2,560	2,595
Fuel alcohol use	628	680	790	890	950	970	990	1,010	1,030	1,050	1,070	1,090
Domestic use	7,854	7,830	7,850	8,045	8,195	8,305	8,390	8,475	8,565	8,625	8,710	8,795
Exports	1,940	2,050	1,925	1,950	2,000	2,050	2,100	2,175	2,275	2,325	2,375	2,425
Total use	9,794	9,880	9,775	9,995	10,195	10,355	10,490	10,650	10,840	10,950	11,085	11,220
Ending stocks	1,899	1,458	1,428	1,298	1,228	1,193	1,218	1,133	1,053	988	988	978
Stocks/use ratio, percent	19.4	14.8	14.6	13.0	12.0	11.5	11.6	10.6	9.7	9.0	8.9	8.7
Prices (dollars per bushel):												
Farm price	1.85	2.10	2.10	2.20	2.25	2.30	2.30	2.40	2.45	2.55	2.55	2.60
Loan rate	1.89	1.89	1.67	1.67	1.72	1.81	1.85	1.89	1.89	1.89	1.89	1.89
Variable costs of production (dollars):												
Per acre	160.34	165.68	165.17	166.40	168.71	171.16	173.81	176.61	179.44	182.28	185.27	188.35
Per bushel	1.17	1.22	1.20	1.19	1.20	1.20	1.20	1.21	1.21	1.22	1.22	1.23
Returns over variable costs (dollars per acre):												
Net returns <sup>1</sup>	128.94	120.55	124.00	140.28	148.77	157.28	158.54	174.27	182.92	199.20	200.54	209.45

1/ Net returns include estimates of marketing loan benefits.

Table 10. Sorghum baseline

Item	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Acreage (million acres):												
Planted acres	9.2	10.0	9.8	9.5	9.6	9.6	9.6	9.6	9.7	9.7	9.8	9.8
Harvested acres	7.7	8.8	8.6	8.3	8.4	8.4	8.4	8.4	8.5	8.5	8.6	8.6
Yields (bushels per acre):												
Yield/harvested acre	60.9	61.0	69.1	69.7	70.3	70.9	71.5	72.1	72.7	73.3	73.9	74.5
Supply and use (million bushels):												
Beginning stocks	65	42	53	83	83	83	88	88	88	88	88	88
Production	470	536	595	580	590	595	600	605	620	625	635	640
Imports	0	0	0	0	0	0	0	0	0	0	0	0
Supply	535	578	648	663	673	678	688	693	708	713	723	728
Feed & residual	219	240	250	265	265	265	265	265	270	270	270	270
Food, seed, & industrial	35	45	65	65	70	70	75	75	80	80	80	80
Domestic	254	285	315	330	335	335	340	340	350	350	350	350
Exports	240	240	250	250	255	255	260	265	270	275	285	290
Total use	494	525	565	580	590	590	600	605	620	625	635	640
Ending stocks	42	53	83	83	83	88	88	88	88	88	88	88
Stocks/use ratio, percent	8.5	10.1	14.7	14.3	14.1	14.9	14.7	14.5	14.2	14.1	13.9	13.8
Prices (dollars per bushel):												
Farm price	1.88	2.05	1.95	2.05	2.05	2.10	2.10	2.20	2.25	2.35	2.35	2.40
Loan rate	1.71	1.71	1.54	1.55	1.63	1.72	1.72	1.74	1.73	1.73	1.73	1.74
Variable costs of production (dollars):												
Per acre	85.25	86.60	86.77	87.39	88.60	89.89	91.30	92.77	94.25	95.74	97.29	98.89
Per bushel	1.40	1.42	1.26	1.25	1.26	1.27	1.28	1.29	1.30	1.31	1.32	1.33
Returns over variable costs (dollars per acre):												
Net returns <sup>1</sup>	38.38	38.45	47.98	55.49	55.52	59.00	58.85	65.85	69.32	76.51	76.37	79.91

1/ Net returns include estimates of marketing loan benefits.

Table 11. Barley baseline

Item	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Acreage (million acres):												
Planted acres	5.9	5.0	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Harvested acres	5.2	4.3	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Yields (bushels per acre):												
Yield/harvested acre	61.1	58.2	62.1	62.7	63.3	63.9	64.5	65.1	65.7	66.3	66.9	67.5
Supply and use (million bushels):												
Beginning stocks	111	106	84	92	105	113	121	119	122	120	118	121
Production	319	250	285	290	290	295	295	300	300	305	310	310
Imports	29	25	35	35	35	35	35	35	35	35	35	35
Supply	459	381	404	417	430	443	451	454	457	460	463	466
Feed & residual	123	95	110	110	115	120	130	130	135	140	140	145
Food, seed, & industrial	172	172	172	172	172	172	172	172	172	172	172	172
Domestic	295	267	282	282	287	292	302	302	307	312	312	317
Exports	58	30	30	30	30	30	30	30	30	30	30	30
Total use	353	297	312	312	317	322	332	332	337	342	342	347
Ending stocks	106	84	92	105	113	121	119	122	120	118	121	119
Stocks/use ratio, percent	30.0	28.3	29.5	33.7	35.6	37.6	35.8	36.7	35.6	34.5	35.4	34.3
Prices (dollars per bushel):												
Farm price	2.11	2.25	2.25	2.35	2.35	2.40	2.40	2.45	2.50	2.55	2.55	2.55
Loan rate	1.62	1.65	1.42	1.43	1.51	1.56	1.57	1.61	1.60	1.59	1.59	1.59
Variable costs of production (dollars):												
Per acre	81.94	84.09	84.10	84.79	86.03	87.34	88.76	90.25	91.75	93.26	94.83	96.46
Per bushel	1.34	1.44	1.35	1.35	1.36	1.37	1.38	1.39	1.40	1.41	1.42	1.43
Returns over variable costs (dollars per acre):												
Net returns <sup>1</sup>	62.87	52.68	55.62	62.55	62.73	66.02	66.04	69.25	72.50	75.81	75.76	75.67

1/ Net returns include estimates of marketing loan benefits.



Table 12. Oats baseline

Item	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Acreage (million acres):												
Planted acres	4.5	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Harvested acres	2.3	1.9	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Yields (bushels per acre):												
Yield/harvested acre	64.2	61.3	61.1	61.5	61.9	62.3	62.7	63.1	63.5	63.9	64.3	64.7
Supply and use (million bushels):												
Beginning stocks	76	73	55	65	69	67	69	65	70	69	72	69
Production	150	117	130	130	130	130	130	135	135	135	135	135
Imports	106	90	105	110	110	115	115	120	120	125	125	130
Supply	332	280	290	305	309	312	314	320	325	329	332	334
Feed & residual	189	155	155	165	170	170	175	175	180	180	185	185
Food, seed, & industrial	68	68	68	69	70	71	72	73	74	75	76	77
Domestic	257	223	223	234	240	241	247	248	254	255	261	262
Exports	2	2	2	2	2	2	2	2	2	2	2	2
Total use	259	225	225	236	242	243	249	250	256	257	263	264
Ending stocks	73	55	65	69	67	69	65	70	69	72	69	70
Stocks/use ratio, percent	28.2	24.4	28.9	29.2	27.7	28.4	26.1	28.0	27.0	28.0	26.2	26.5
Prices (dollars per bushel):												
Farm price	1.10	1.30	1.20	1.25	1.30	1.35	1.35	1.40	1.40	1.45	1.45	1.45
Loan rate	1.16	1.21	1.02	0.97	1.00	1.05	1.07	1.08	1.10	1.10	1.09	1.09
Variable costs of production (dollars):												
Per acre	50.75	52.54	52.33	52.81	53.53	54.31	55.14	56.01	56.89	57.78	58.72	59.67
Per bushel	0.79	0.86	0.86	0.86	0.86	0.87	0.88	0.89	0.90	0.90	0.91	0.92
Returns over variable costs (dollars per acre):												
Net returns <sup>1</sup>	39.13	33.89	22.21	24.07	26.94	29.80	29.51	32.33	32.01	34.87	34.52	34.14

1/ Net returns include estimates of marketing loan benefits.

Table 13. Wheat baseline

Item	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Acreage (million acres):												
Planted acres	62.6	59.6	61.0	61.0	61.0	61.5	62.0	62.0	63.0	63.5	64.0	64.0
Harvested acres	53.1	48.7	52.8	52.8	52.8	53.3	53.7	53.7	54.6	55.0	55.4	55.4
Yields (bushels per acre):												
Yield/harvested acre	42.0	40.2	41.5	41.9	42.3	42.7	43.1	43.5	43.9	44.3	44.7	45.1
Supply and use (million bushels):												
Beginning stocks	950	876	652	674	691	677	672	672	656	639	627	620
Production	2,232	1,958	2,190	2,210	2,235	2,275	2,315	2,335	2,395	2,435	2,475	2,500
Imports	90	90	100	105	110	115	115	115	115	115	115	115
Supply	3,272	2,924	2,942	2,989	3,036	3,067	3,102	3,122	3,166	3,189	3,217	3,235
Food	957	960	960	965	975	985	995	1,005	1,015	1,025	1,035	1,045
Seed	80	87	83	83	84	85	85	86	87	87	87	88
Feed & residual	297	200	275	275	275	250	250	225	225	225	225	225
Domestic	1,334	1,247	1,318	1,323	1,334	1,320	1,330	1,316	1,327	1,337	1,347	1,358
Exports	1,061	1,025	950	975	1,025	1,075	1,100	1,150	1,200	1,225	1,250	1,275
Total use	2,396	2,272	2,268	2,298	2,359	2,395	2,430	2,466	2,527	2,562	2,597	2,633
Ending stocks	876	652	674	691	677	672	672	656	639	627	620	602
Stocks/use ratio, percent	36.6	28.7	29.7	30.1	28.7	28.1	27.7	26.6	25.3	24.5	23.9	22.9
Prices (dollars per bushel):												
Farm price	2.62	2.85	2.75	2.75	2.85	2.95	3.00	3.15	3.25	3.35	3.40	3.50
Loan rate	2.58	2.58	2.30	2.27	2.30	2.36	2.40	2.42	2.49	2.58	2.58	2.58
Variable costs of production (dollars):												
Per acre	59.04	61.08	60.89	61.48	62.43	63.42	64.49	65.62	66.75	67.89	69.09	70.33
Per bushel	1.41	1.52	1.47	1.47	1.48	1.49	1.50	1.51	1.52	1.53	1.55	1.56
Returns over variable costs (dollars per acre):												
Net returns <sup>1</sup>	66.96	56.70	53.23	53.74	58.13	62.54	64.81	71.40	75.92	80.51	82.89	87.52

1/ Net returns include estimates of marketing loan benefits.

Table 14. Rice baseline

Item	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Acreage (thousand acres):												
Planted	3,060	3,317	3,250	3,250	3,250	3,250	3,250	3,240	3,230	3,220	3,210	3,200
Harvested	3,039	3,290	3,224	3,224	3,224	3,224	3,224	3,214	3,204	3,194	3,184	3,174
Yields (pounds per acre):												
Yield/harvested acre	6,281	6,328	6,300	6,332	6,363	6,395	6,427	6,460	6,493	6,527	6,560	6,594
Supply and use (million cwt):												
Beginning stocks	27.5	28.4	40.6	42.9	44.1	44.0	43.8	43.2	41.7	39.1	36.7	34.1
Production	190.9	208.2	203.0	204.1	205.1	206.2	207.2	207.6	208.0	208.5	208.9	209.3
Imports	10.9	11.0	11.3	11.6	11.9	12.2	12.5	12.8	13.1	13.4	13.8	14.1
Total supply	229.2	247.6	254.9	258.6	261.0	262.4	263.4	263.6	262.7	261.1	259.3	257.5
Domestic use and residual	117.6	121.0	124.0	126.5	129.0	131.6	134.2	136.9	139.6	142.4	145.2	148.1
Exports	83.2	86.0	88.0	88.0	88.0	87.0	86.0	85.0	84.0	82.0	80.0	78.0
Total use	200.8	207.0	212.0	214.5	217.0	218.6	220.2	221.9	223.6	224.4	225.2	226.1
Ending stocks (million cwt.)	28.4	40.6	42.9	44.1	44.0	43.8	43.2	41.7	39.1	36.7	34.1	31.4
Stocks/use ratio, percent	14.2	19.6	20.2	20.5	20.3	20.0	19.6	18.8	17.5	16.3	15.1	13.9
Milling rate, percent	69.0	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5	69.5
Prices (dollars per cwt.):												
World price	3.20	3.00	3.10	3.19	3.29	3.39	3.49	3.59	3.70	3.81	3.92	4.04
Average market price	5.56	4.25	4.30	4.40	4.53	4.67	4.81	4.97	5.18	5.39	5.62	5.88
Loan rate	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50	6.50
Variable costs of production (dollars):												
Per acre	386	389	390	393	400	406	413	421	428	436	443	451
Per cwt.	6.15	6.15	6.19	6.21	6.28	6.35	6.43	6.51	6.59	6.67	6.76	6.85
Returns over variable costs (dollars per acre):												
Net returns <sup>1</sup>	160	101	95	95	93	91	89	88	90	92	95	99

<sup>1/</sup> Net returns include estimates of marketing loan benefits.

Table 15. Upland cotton baseline

Item	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Acreage (million acres):												
Planted acres	15.3	16.0	15.1	14.8	14.7	14.6	14.5	14.3	14.1	14.0	13.9	13.8
Harvested acres	12.9	13.9	13.7	13.5	13.4	13.3	13.2	13.0	12.8	12.7	12.6	12.6
Yields (pounds per acre):												
Yield/harvested acre	626	672	630	632	634	636	638	640	642	644	646	648
Supply and use (thousand bales):												
Beginning stocks	3,672	5,881	8,614	8,500	7,600	7,100	6,750	6,550	6,350	6,150	6,000	6,000
Production	16,799	19,457	18,000	17,800	17,700	17,600	17,500	17,300	17,100	17,000	17,000	17,000
Imports	3	0	5	5	5	5	5	5	5	5	5	5
Supply	20,474	25,338	26,619	26,305	25,305	24,705	24,255	23,855	23,455	23,155	23,005	23,005
Domestic use	8,760	8,190	8,100	8,200	8,200	8,050	7,900	7,800	7,700	7,650	7,600	7,550
Exports	6,326	8,540	10,000	10,500	10,000	9,900	9,800	9,700	9,600	9,500	9,400	9,300
Total use	15,086	16,730	18,100	18,700	18,200	17,950	17,700	17,500	17,300	17,150	17,000	16,850
Ending stocks	5,881	8,614	8,500	7,600	7,100	6,750	6,550	6,350	6,150	6,000	6,000	6,150
Stocks/use ratio, percent	39.0	51.5	47.0	40.6	39.0	37.6	37.0	36.3	35.5	35.0	35.3	36.5
Prices (dollars per pound):												
Farm price <sup>1</sup>	0.498	--	--	--	--	--	--	--	--	--	--	--
Loan rate	0.5192	0.5192	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000	0.5000
Variable costs of production (dollars):												
Per acre	289.79	301.53	300.16	303.44	309.14	314.99	321.31	327.79	334.37	340.98	347.78	354.81
Per pound	0.46	0.45	0.48	0.48	0.49	0.50	0.50	0.51	0.52	0.53	0.54	0.55
Returns over variable costs (dollars per acre):												
Net returns <sup>2</sup>	115.42	138.30	77.46	68.43	72.47	70.10	67.30	65.42	69.26	73.05	70.83	67.82

<sup>1/</sup> USDA is prohibited from publishing cotton price projections.

<sup>2/</sup> Net returns include estimates of marketing loan benefits.

Table 16. Soybean and products baseline

Item	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
<b>Soybeans</b>												
Acreage (million acres)												
Planted	74.3	75.2	75.5	74.5	74.0	73.8	74.3	75.0	75.5	75.8	76.0	76.3
Harvested	72.4	74.1	74.5	73.5	73.0	72.8	73.3	74.0	74.5	74.8	75.0	75.3
Yield/harvested acre (bushels)	38.1	39.2	39.5	40.0	40.5	41.0	41.5	42.0	42.5	43.0	43.5	44.0
Supply (million bushels)												
Beginning stocks, Sep. 1	290	248	345	415	410	375	320	275	255	240	230	225
Production	2,758	2,907	2,945	2,940	2,955	2,985	3,040	3,110	3,165	3,215	3,265	3,310
Imports	4	3	7	8	9	8	5	9	7	5	7	9
Total supply	3,052	3,158	3,297	3,363	3,374	3,368	3,365	3,394	3,427	3,460	3,502	3,544
Disposition (million bushels)												
Crush	1,641	1,660	1,700	1,740	1,775	1,810	1,840	1,875	1,910	1,940	1,975	2,010
Seed and residual	162	173	173	173	175	177	180	184	187	190	192	194
Exports	1,000	980	1,010	1,040	1,050	1,060	1,070	1,080	1,090	1,100	1,110	1,120
Total disposition	2,804	2,813	2,883	2,953	3,000	3,047	3,091	3,139	3,187	3,230	3,277	3,324
Carryover stocks, Aug. 31												
Total ending stocks	248	345	415	410	375	320	275	255	240	230	225	220
Stocks/use ratio, percent	8.8	12.3	14.4	13.9	12.5	10.5	8.9	8.1	7.5	7.1	6.9	6.6
Prices (dollars per bushel)												
Loan rate	5.26	5.26	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	5.03
Soybean price, farm	4.55	4.30	4.35	4.50	4.75	5.10	5.45	5.75	5.90	6.10	6.15	6.20
Variable costs of production (dollars):												
Per acre	76.99	79.19	79.42	79.85	80.98	82.15	83.43	84.77	86.14	87.50	88.92	90.40
Per bushel	2.02	2.02	2.01	2.00	2.00	2.00	2.01	2.02	2.03	2.03	2.04	2.05
Returns over variable costs (dollars per acre):												
Net returns <sup>1</sup>	131.04	136.80	124.79	126.95	128.41	129.82	142.74	156.73	164.61	174.80	178.60	182.40
<b>Soybean oil</b> (million pounds)												
Beginning stocks, Oct. 1	1,995	2,800	2,490	2,235	2,070	1,950	1,875	1,795	1,770	1,775	1,720	1,665
Production	18,480	18,760	19,210	19,670	20,085	20,500	20,865	21,290	21,715	22,075	22,495	22,915
Imports	75	80	85	90	95	100	105	110	115	120	125	130
Total supply	20,550	21,640	21,785	21,995	22,250	22,550	22,845	23,195	23,600	23,970	24,340	24,710
Domestic disappearance	16,350	16,700	17,050	17,400	17,750	18,100	18,450	18,800	19,175	19,550	19,925	20,300
Exports	1,400	2,450	2,500	2,525	2,550	2,575	2,600	2,625	2,650	2,700	2,750	2,800
Total demand	17,750	19,150	19,550	19,925	20,300	20,675	21,050	21,425	21,825	22,250	22,675	23,100
Ending stocks, Sep. 30	2,800	2,490	2,235	2,070	1,950	1,875	1,795	1,770	1,775	1,720	1,665	1,610
Soybean oil price (dollars per lb)	0.142	0.155	0.163	0.178	0.193	0.208	0.220	0.228	0.235	0.240	0.245	0.250
<b>Soybean meal</b> (thousand short tons)												
Beginning stocks, Oct. 1	293	325	275	250	250	250	250	250	250	250	250	250
Production	39,409	39,750	40,660	41,570	42,410	43,200	44,000	44,800	45,600	46,400	47,200	48,000
Imports	48	50	65	80	90	100	100	100	100	100	100	100
Total supply	39,750	40,125	41,000	41,900	42,750	43,550	44,350	45,150	45,950	46,750	47,550	48,350
Domestic disappearance	31,850	32,450	33,200	33,900	34,600	35,300	36,000	36,700	37,400	38,100	38,800	39,500
Exports	7,575	7,400	7,550	7,750	7,900	8,000	8,100	8,200	8,300	8,400	8,500	8,600
Total demand	39,425	39,850	40,750	41,650	42,500	43,300	44,100	44,900	45,700	46,500	47,300	48,100
Ending stocks, Sep. 30	325	275	250	250	250	250	250	250	250	250	250	250
Soybean meal price (dollars per ton)	173.60	155.00	155.00	152.50	154.00	161.00	168.50	177.00	179.00	185.00	185.00	185.00
Crushing yields (pounds per bushel)												
Soybean oil	11.26	11.30	11.30	11.31	11.32	11.33	11.34	11.36	11.37	11.38	11.39	11.40
Soybean meal	48.04	47.88	47.84	47.80	47.80	47.80	47.80	47.80	47.80	47.80	47.80	47.80
Crush margin (dollars per bushel)	1.21	1.16	1.20	1.16	1.11	1.10	1.07	1.07	1.05	1.05	1.06	1.07

<sup>1/</sup> Net returns include estimates of marketing loan benefits.

Table 17. U.S. sugar: supply, disappearance, and prices, fiscal years 1/

Item	Units	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<b>Sugarbeets</b>													
Planted area	1,000 acres	1,565	1,368	1,440	1,431	1,440	1,434	1,424	1,414	1,409	1,404	1,402	1,401
Harvested area	1,000 acres	1,374	1,331	1,409	1,401	1,409	1,404	1,394	1,384	1,379	1,375	1,373	1,372
Yield	Tons/acre	23.6	21.3	21.4	21.5	21.5	21.7	21.8	21.9	22.0	22.1	22.2	22.3
Production	Mil. s. tons	32.4	28.3	30.2	30.1	30.4	30.4	30.3	30.3	30.3	30.4	30.5	30.6
<b>Sugarcane</b>													
Harvested area	1,000 acres	968	973	1,005	979	971	962	953	947	949	947	947	947
Yield	Tons/acre	35.0	35.5	35.3	35.1	35.2	35.2	35.2	35.3	35.3	35.3	35.3	35.3
Production	Mil. s. tons	33.9	34.6	35.4	34.4	34.1	33.9	33.6	33.4	33.5	33.4	33.4	33.4
<b>Supply:</b>													
Beginning stocks	1,000 s. tons	2,218	2,126	1,496	1,876	2,038	2,112	2,059	1,863	1,585	1,538	1,405	1,295
Production	1,000 s. tons	8,712	8,345	8,814	8,713	8,763	8,772	8,765	8,766	8,817	8,854	8,905	8,960
Beet sugar	1,000 s. tons	4,640	4,150	4,426	4,428	4,485	4,501	4,503	4,505	4,521	4,539	4,564	4,594
Cane sugar	1,000 s. tons	4,072	4,195	4,388	4,285	4,278	4,271	4,262	4,262	4,296	4,314	4,340	4,366
Total imports	1,000 s. tons	1,549	1,631	2,241	2,259	2,256	2,254	2,255	2,305	2,620	2,633	2,741	2,848
TRQ less NAFTA <sup>2</sup>	1,000 s. tons	1,121	1,189	1,204	1,204	1,204	1,204	1,204	1,204	1,204	1,204	1,204	1,204
Mexico - NAFTA low-tier	1,000 s. tons	117	152	177	164	147	132	115	0	0	0	0	0
Mexico - NAFTA high-tier <sup>3</sup>	1,000 s. tons	3	25	545	576	590	604	621	786	1,101	1,114	1,222	1,329
Re-export and polyhydric	1,000 s. tons	238	265	315	315	315	315	315	315	315	315	315	315
Other imports (17029040)	1,000 s. tons	70	0	0	0	0	0	0	0	0	0	0	0
Total supply	1,000 s. tons	12,479	12,102	12,551	12,848	13,057	13,139	13,078	12,935	13,023	13,025	13,050	13,103
<b>Use:</b>													
Exports	1,000 s. tons	135	125	150	150	150	150	150	150	150	150	150	150
Domestic deliveries	1,000 s. tons	10,208	10,390	10,525	10,660	10,795	10,930	11,065	11,200	11,335	11,470	11,605	11,740
Miscellaneous	1,000 s. tons	10	90	0	0	0	0	0	0	0	0	0	0
Total use	1,000 s. tons	10,353	10,605	10,675	10,810	10,945	11,080	11,215	11,350	11,485	11,620	11,755	11,890
Ending stocks	1,000 s. tons	2,126	1,496	1,876	2,038	2,112	2,059	1,863	1,585	1,538	1,405	1,295	1,213
Stocks/use ratio	Percent	20.5	14.1	17.6	18.9	19.3	18.6	16.6	14.0	13.4	12.1	11.0	10.2
<b>Raw sugar price:</b>													
New York (No. 14)	Cents/lb.	21.50	21.57	19.68	19.67	19.67	19.67	20.12	21.48	21.78	22.44	23.00	23.42
Raw sugar loan rate	Cents/lb.	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
Beet sugar loan rate	Cents/lb.	22.90	22.90	22.90	22.90	22.90	22.90	22.90	22.90	22.90	22.90	22.90	22.90
<b>Grower prices:</b>													
Sugarbeets	Dol./ton	38.19	38.85	38.15	38.16	38.16	38.17	38.17	38.76	39.23	40.27	41.14	41.80
Sugarcane	Dol./ton	26.82	26.86	25.40	25.39	25.38	25.37	25.80	27.10	27.35	27.96	28.44	28.80

1/ Fiscal year is October 1 through September 30.

2/ Includes 8,000 STRV allocated to Mexico as part of the raw sugar TRQ and 3,256 STRV to Mexico as part of the refined sugar TRQ.

3/ Starting in FY 2008 under NAFTA, Mexico can ship duty-free sugar to the United States with no quantitative limit.

Table 18. Flue-cured tobacco baseline

Item	Unit	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Acreage, yield, and production:													
Planted area	1,000 acres	251	249	298	302	300	293	285	275	265	255	250	245
Harvested area	1,000 acres	251	249	298	302	300	293	285	275	265	255	250	245
Yield	lbs./acre	2,229	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250
Production	Mil. lbs.	560	560	670	680	675	660	641	619	596	574	563	551
Supply:													
Beginning stocks	Mil. lbs.	1,190	949	809	794	804	824	844	864	889	899	889	874
Marketings	Mil. lbs.	564	560	670	680	675	660	640	620	600	570	560	550
Total <sup>1</sup>	Mil. lbs.	1,754	1,509	1,479	1,474	1,479	1,484	1,484	1,484	1,489	1,469	1,449	1,424
Imports	Mil. lbs.	200	200	220	240	260	280	300	300	310	320	320	330
Use:													
Domestic	Mil. lbs.	479	450	440	430	420	410	390	380	370	365	360	350
Exports	Mil. lbs.	238	250	245	240	235	230	230	225	220	215	210	210
Total <sup>1</sup>	Mil. lbs.	717	700	685	670	655	640	620	605	590	580	570	560
Ending stocks:													
Total <sup>2</sup>	Mil. lbs.	949	809	794	804	824	844	864	889	899	889	874	864
Price:													
Avg. to growers	\$/cwt	174	179	182	185	188	172	175	200	203	206	209	212
Support	\$/cwt	164	166	165	169	172	175	182	185	188	191	195	198

1/ Domestic tobacco only.

2/ 2000 ending stocks do not include CCC loan forgiveness of 88 million pounds.

Table 19. Burley tobacco baseline

Item	Unit	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Acreage, yield, and production:													
Planted area	1,000 acres	185	175	155	190	181	179	179	170	170	165	165	160
Harvested area	1,000 acres	185	175	155	190	181	179	179	170	170	165	165	160
Yield	lbs./acre	1,957	2,133	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
Production	Mil. lbs.	363	373	326	399	380	376	376	357	357	347	347	336
Supply:													
Beginning stocks	Mil. lbs.	1,040	696	636	551	556	556	566	581	581	581	576	566
Marketings	Mil. lbs.	311	360	325	400	380	375	375	360	355	350	340	335
Total <sup>1</sup>	Mil. lbs.	1,351	1,056	961	951	936	931	941	941	936	931	916	901
Imports	Mil. lbs.	165	175	175	185	195	205	205	205	210	220	225	225
Use:													
Domestic	Mil. lbs.	285	285	280	270	260	260	260	260	250	250	245	245
Exports	Mil. lbs.	140	135	130	125	120	105	100	100	105	105	105	105
Total <sup>1</sup>	Mil. lbs.	425	420	410	395	380	365	360	360	355	355	350	350
Ending stocks:													
Total <sup>2</sup>	Mil. lbs.	696	636	551	556	556	566	581	581	581	576	566	551
Price:													
Avg. to growers	\$/cwt	190	196	200	203	206	209	212	216	219	223	227	230
Support	\$/cwt	181	183	188	191	194	197	200	203	206	209	212	214

1/ Domestic tobacco only.

2/ 2000 ending stocks do not include CCC loan forgiveness of 230 million pounds.

Table 20. Fruit, vegetable, and greenhouse/nursery baseline, production and prices

Item	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Production value:													
Fruit and nuts													
Citrus	\$ Mil.	2,515	2,262	2,569	2,763	2,818	2,871	2,921	2,976	3,030	3,081	3,143	3,201
Noncitrus	\$ Mil.	7,882	7,977	8,315	8,630	8,956	9,272	9,611	9,954	10,286	10,608	10,922	11,231
Nuts	\$ Mil.	1,527	1,828	1,814	2,091	2,008	2,259	2,206	2,360	2,331	2,483	2,471	2,667
Total	\$ Mil.	11,924	12,067	12,698	13,484	13,782	14,402	14,738	15,290	15,647	16,172	16,536	17,099
Vegetables													
Fresh <sup>1</sup>	\$ Mil.	8,590	8,961	9,162	9,554	9,954	10,357	10,770	11,195	11,635	12,091	12,564	13,055
Processed <sup>2</sup>	\$ Mil.	1,513	1,337	1,531	1,574	1,615	1,662	1,702	1,741	1,779	1,814	1,849	1,883
Potatoes	\$ Mil.	2,591	3,150	3,263	3,233	3,063	3,050	3,136	3,266	3,390	3,483	3,539	3,569
Sweet potatoes	\$ Mil.	211	221	229	234	240	245	251	256	262	268	274	280
Pulses	\$ Mil.	482	539	644	716	766	792	819	846	875	904	934	966
Mushrooms	\$ Mil.	867	863	896	918	936	953	968	982	995	1,006	1,017	1,027
Total	\$ Mil.	14,254	15,071	15,725	16,229	16,574	17,059	17,646	18,286	18,936	19,566	20,177	20,780
Greenhouse/Nursery	\$ Mil.	13,037	13,487	13,937	14,387	14,837	15,287	15,737	16,187	16,637	17,087	17,537	17,987
Production:													
Fruit and nuts													
Citrus	1,000 MT	15,673	14,871	15,173	15,467	15,543	15,707	15,842	16,089	16,246	16,271	16,483	16,550
Noncitrus	1,000 MT	17,072	15,385	16,103	16,238	16,329	16,418	16,639	16,884	17,093	17,269	17,414	17,532
Nuts	1,000 MT	519	627	592	548	620	603	566	679	557	706	611	650
Total	1,000 MT	33,264	30,883	31,868	32,253	32,492	32,728	33,047	33,652	33,896	34,246	34,508	34,732
Vegetables													
Fresh <sup>1</sup>	1,000 MT	20,031	20,072	20,578	21,116	21,646	22,154	22,654	23,153	23,654	24,159	24,670	25,187
Processed <sup>2</sup>	1,000 MT	15,640	14,116	15,556	15,945	16,191	16,472	16,720	16,967	17,203	17,431	17,655	17,875
Potatoes	1,000 MT	23,297	20,412	21,180	22,878	24,354	25,051	25,346	25,473	25,625	25,909	26,342	26,874
Sweet potatoes	1,000 MT	626	642	672	673	680	685	691	697	704	710	717	724
Pulses	1,000 MT	1,530	1,180	1,575	1,787	1,898	1,933	1,969	2,005	2,042	2,079	2,118	2,157
Mushrooms	1,000 MT	394	387	405	420	434	447	459	471	482	493	503	514
Total	1,000 MT	61,518	56,809	59,966	62,819	65,203	66,742	67,839	68,766	69,710	70,781	72,005	73,331
Prices:													
Grower													
Fruit and nuts	1990-92=100	101	108	115	123	125	127	129	132	134	136	138	141
Vegetables	1990-92=100	122	135	129	131	133	135	137	139	142	144	146	148
Potatoes	\$/MT	112	154	154	141	126	122	124	128	132	134	134	133
Dry beans	\$/MT	337	551	446	441	448	454	461	468	475	482	489	497
Retail													
Fruit and vegetables	1982-84=100	205	212	216	220	226	232	238	244	250	256	262	269
Fresh fruit	1982-84=100	258	265	266	275	284	293	302	311	320	328	337	346
Fresh vegetables	1982-84=100	219	231	236	240	246	252	258	265	272	279	285	292
Processed fruit & veg.	Dec 1997=100	106	109	113	118	121	124	127	129	132	135	138	141

1/ Includes artichokes, asparagus, snap beans, broccoli, brussels sprouts, cabbage, carrots, cauliflower, celery, sweet corn, eggplant, escarole-endive, garlic, lettuce, bell peppers, onions, spinach, tomatoes, and melons.

2/ Includes asparagus, lima beans, snap beans, broccoli, beets, cabbage, carrots, cauliflower, sweet corn, cucumbers, green peas, spinach, and tomatoes.



Table 21. Fruit, vegetable, and greenhouse/nursery baseline, trade

Item	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Imports</b>													
Fruit and nuts <sup>1</sup>													
Fresh	\$ Mil.	3,165	3,269	3,426	3,552	3,678	3,804	3,931	4,057	4,184	4,312	4,439	4,567
Processed	\$ Mil.	3,643	3,600	3,726	3,850	3,996	4,145	4,299	4,460	4,627	4,803	4,986	5,178
Nuts	\$ Mil.	771	694	742	757	772	787	803	819	835	852	869	886
Total	\$ Mil.	7,579	7,563	7,894	8,159	8,446	8,736	9,033	9,336	9,646	9,967	10,294	10,631
Vegetables <sup>2</sup>													
Fresh	\$ Mil.	2,255	2,306	2,432	2,500	2,584	2,679	2,780	2,886	2,994	3,103	3,213	3,324
Processed	\$ Mil.	965	1,028	1,060	1,087	1,117	1,149	1,182	1,215	1,247	1,278	1,308	1,339
Potatoes	\$ Mil.	500	484	524	553	568	587	611	638	668	698	729	760
Sweet potatoes	\$ Mil.	22	23	26	26	27	28	28	29	29	30	30	31
Pulses	\$ Mil.	70	65	69	72	76	79	83	86	90	93	97	101
Mushrooms	\$ Mil.	199	201	185	185	186	188	190	192	194	197	199	202
Total	\$ Mil.	4,011	4,107	4,296	4,423	4,558	4,710	4,874	5,046	5,222	5,399	5,576	5,757
Greenhouse/Nursery	\$ Mil.	1,161	1,184	1,267	1,355	1,450	1,552	1,660	1,777	1,901	2,034	2,176	2,329
<b>Exports</b>													
Fruit and nuts <sup>1</sup>													
Fresh	\$ Mil.	2,077	2,129	2,206	2,256	2,308	2,361	2,415	2,470	2,527	2,585	2,645	2,706
Processed	\$ Mil.	1,906	1,903	1,967	2,041	2,119	2,201	2,286	2,376	2,470	2,570	2,674	2,785
Nuts	\$ Mil.	1,109	1,153	1,182	1,211	1,239	1,267	1,295	1,322	1,349	1,376	1,402	1,429
Total	\$ Mil.	5,092	5,185	5,355	5,508	5,666	5,829	5,996	6,168	6,346	6,531	6,721	6,920
Vegetables <sup>2</sup>													
Fresh	\$ Mil.	1,175	1,138	1,190	1,199	1,255	1,278	1,327	1,356	1,399	1,431	1,470	1,504
Processed	\$ Mil.	1,093	1,094	1,159	1,200	1,245	1,278	1,315	1,362	1,394	1,430	1,478	1,508
Potatoes	\$ Mil.	768	810	840	872	937	998	1,046	1,088	1,128	1,167	1,209	1,254
Sweet potatoes	\$ Mil.	11	12	12	13	14	14	15	16	16	17	18	19
Pulses	\$ Mil.	257	289	311	330	341	346	352	357	362	368	374	379
Mushrooms	\$ Mil.	23	21	26	28	29	30	31	33	34	35	36	38
Total	\$ Mil.	3,327	3,364	3,538	3,642	3,821	3,944	4,086	4,212	4,333	4,448	4,585	4,702
Greenhouse/Nursery	\$ Mil.	278	281	290	299	307	317	326	336	346	356	367	378

1/ Fresh fruit includes bananas, excludes melons. Processed fruit includes juices and wine.

2/ Fresh vegetables includes melons. Processed includes seed and juices.

Note: Fiscal year trade value projections for total horticultural products are shown in table 35.

## **Livestock**

Relatively low grain and soybean meal prices will continue to influence the U.S. livestock industry for the near term, with moderate increases in feed costs later in the projections. At the same time, most farm-level and retail prices in the livestock industry are projected to increase over the baseline period. The beef and pork sectors are expected to benefit from relatively low feed costs along with increased farm-level and retail prices and expand their production. However, poor forage conditions in recent years, biological lags, and lags in input decisions will delay beef expansion during the first half of the baseline period. Poultry production continues to rise through the projections but at a slowing rate due to the maturity of the sector.

The trend towards larger and more commercialized livestock and dairy systems will continue throughout the baseline period, although environmental issues constrain growth. Vertical coordination (alliances) will increase in the beef sector as strong demand for higher quality beef continues. The transformation to a more vertically coordinated pork sector will continue, with the larger, more efficient pork producers increasing their market share. The restructuring of the Canadian and U.S. pork sectors will continue the development of an integrated North American pork industry. Efficiency gains in poultry production will slow from the rapid gains of the past 25 years. Over the projections period, strengthening milk-feed price ratios, improved management, and dairy productivity gains will push milk output per cow higher and real costs lower.

In the aggregate, per capita meat consumption will increase slowly over the baseline. Small reductions in per capita consumption will be seen for beef and pork. Per capita consumption will continue to rise in the relatively lower priced poultry sector, particularly in broilers, although gains will slow in the latter half of the projections. On a retail weight basis, therefore, total poultry consumption is projected to gain market share of total meat consumption.

Both table egg production and hatching egg production will show slight expansions during the baseline. Hatching egg production, mainly a result of expanding broiler production, is expected to increase at a slightly faster rate than overall egg production. Per capita consumption of eggs is expected to increase during the forecast period, fueled mainly by increases in processed egg products. Wholesale egg prices are expected to increase during the baseline period.

Milk production grows through the baseline despite declining cow numbers as milk output per cow continues to increase. Productivity gains in the sector will reflect the continued structural shift to larger-sized operations in the sector--many traditional dairy farms, particularly smaller operations, will experience income stress and will exit the industry. Domestic dairy demand is expected to show slow growth. Farm milk prices are expected to increase at less than the general inflation rate.

## **Beef**

Beef cattle inventories have continued to be held down by poor forage conditions over the past several years even as cattle returns have improved. With the exception of the Corn Belt, most

major cattle producing areas were hit with severe drought in 2000 and 2001. Weather took an unusually heavy toll on the beef sector in 2001 as the most severe winter since 1992/93 resulted in poor feedlot performance and sharply reduced slaughter weights. In the second half of the year, feedlot performance improved and there was another round of record slaughter weights. Although grain prices were favorable for cattle feeders and feeder cattle prices strengthened, the drought and poor forage supplies through 2001 extended the liquidation phase of the cattle cycle that began in 1995/96. Large beef cow slaughter in 1996-1998 reflected adjustments to low cow-calf returns during that period. Extended drought in 1999 and 2000 resulted in record heifer slaughter and, combined with the length of the biological lag, held down the beef cow herd expansion. Beef cow slaughter rose 11 percent during 2001 due to the severe winter followed by drought, further forestalling expansion. Additionally, more heifers were placed in feedlots rather than retained for calving.

The cattle herd builds from a cyclical low near 96 million head in 2003-2004 to about 104 million head by the end of the baseline. The last cattle cycle was 9 years in duration; the present cycle is in its thirteenth year, with two more liquidation years likely. The next cycle is likely to expand slowly as herd adjustments continue and will likely not peak during the baseline. Shifts toward larger-framed, higher-grading cattle result in heavier slaughter weights, partly offsetting the need for expanding cattle inventories to previous levels. With additional incentives to produce higher grading cattle, structural adjustment in herd genetics likely will increase over the cycle.

Drawing from a smaller inventory, beef production declines through 2004 as heifers are retained for the breeding herd. Beef output then increases only gradually through the rest of the baseline. Coupled with larger exports and generally declining imports, annual per capita beef consumption moderates toward 62 to 63 pounds (retail weight) from the cyclical liquidation peak of 69 pounds in 2000. The beef production mix continues to shift toward a larger proportion of higher-quality, hotel-restaurant and export-market products as nearly all steers and heifers are fed in feedlots. Calf slaughter will continue at relatively low levels as most are placed on feed.

Feeder cattle will remain on grass longer and will be marketed at heavier weights as inventories increase and feeder cattle supplies begin to rise. Cattle will remain in feedlots for 120 to 140 days to grade Select or low Choice. However, an increasing proportion of cattle will be fed somewhat longer to higher grades with dressed slaughter weights growing slowly during the baseline. Weights will be moderated to some extent as cow slaughter rises toward the end of the period. Heavier placement weights will hold down feed grain use and feed fed per pound of fed beef produced. The strongest prices will be received for cattle that grade Choice or higher for the growing export and domestic hotel-restaurant markets. The price spread between Choice and Select beef is likely to remain wide.

Adequate land resources will remain available to the cattle and crop sectors during the next 10 years. In addition, the 1996 Farm Act further expands the forage base by allowing haying and grazing at any time on land enrolled in production flexibility contracts. Conservation Reserve Program acreage will remain over 30 million acres. Grazing and haying on CRP acreage will continue to be allowed under restricted conditions during emergencies such as drought and floods. This potential availability of forage, combined with a shift toward cow-calf-yearling

operations, allows flexibility in the use of forage and the marketing of feeder cattle. In the event of poor forage conditions, for example, feeder cattle can be marketed early, allowing the cow herd to be maintained.

Veal production falls throughout the period. A larger share of veal production will come from higher-valued, formula-fed calves marketed at heavier weights. Declining dairy cow numbers reduce the supply of dairy calves. High stocker and feeder cattle prices will encourage more of these dairy calves to move into feedlot channels rather than being slaughtered as young calves.

The United States becomes a net beef exporter near the end of the baseline. Beef exports will rise from about 8 to 9 percent of production, reaching 10 to 11 percent. The United States remains the primary source of high-quality fed beef for export, including exports for the hotel-restaurant trade. High-quality beef exports continue to increase through the baseline, primarily to Pacific Rim nations. Australia and New Zealand will also increase exports to Pacific Rim nations, although their beef will be mostly lower quality, grass-fed beef. However, the United States will remain an important market for Oceania, especially early in the projections as U.S. herd expansion keeps beef cow slaughter low. U.S. emphasis on fed beef production will result in relatively high imports of processing beef. Most processing beef will be used in relatively higher-valued hamburger as large supplies of low priced processing-quality poultry and pork are used in lower valued manufactured products.

## **Pork**

Over the next decade, the U.S. pork sector will continue to be characterized by vertical coordination that restructured the industry in the 1990s. Such vertical linkages will continue to develop at accelerating rates between fewer, larger hog producers and pork processors to produce timely, case-ready, processor-differentiated pork products bearing characteristics desired by domestic and foreign consumers.

Restructuring of pork industries in both Canada and the United States will continue to extend across national borders, furthering the development of an integrated North American pork industry. The Canadian industry is likely to specialize further in the production of feeder pigs for export to the United States, allowing the U.S. industry to utilize its relative advantage in hog-finishing in Corn Belt States with the abundance of corn and in hog slaughtering through lower U.S. labor costs.

The assumed absence in the baseline of significant supply or demand shocks during the projections period, combined with a more coordinated/integrated industrial structure and existing environmental constraints on expansion of large operations, serves to dampen the amplitude of the U.S. hog cycle. Consequently, U.S. pork production is projected to increase throughout the baseline period, albeit at a rate that averages only 0.7 percent annually over the 10-year forecast period. By 2011, production is expected to be about 20.2 billion pounds. U.S. per capita pork consumption on a retail-weight basis varies in a narrow range of 50 to 52 pounds per person, with nominal hog prices (national base, live equivalent) increasing slowly.

The United States is an important net pork exporter, although projected gains in the baseline are largely dependent on the outcome of competition with Canada in Asian markets as well as in Mexico. Moreover, Mexico is likely to become important U.S. competitor as the decade proceeds. Longer-term gains in pork exports by the United States and its competitors will be determined by relative costs of pork production and environmental regulation. Such costs tend to be lower in countries with small, but growing pork industries, such as Mexico. Prospects for long-term growth markets for U.S. pork exports remain focused on Pacific Rim nations. Both U.S. pork imports and exports grow moderately over the forecast period. It is likely that the EU will account for a declining share of U.S. imports, supplying frozen ribs during barbecue season, while Canada's share of the U.S. fresh and frozen import market increases year around.

### **Poultry and Eggs**

During the baseline period, overall per capita poultry meat consumption is expected to grow at the expense of beef and pork consumption. Most of the gain in poultry consumption is expected to come from broilers as per capita turkey consumption is forecast to only increase slightly in the first half of the baseline and taper by the end of the baseline. The gain in poultry consumption is expected to come primarily from the relative price advantage poultry has compared to beef and pork products.

To successfully deal with the higher levels of production, poultry processing companies are expected to target both domestic and foreign markets. The focus in foreign markets is expected to be on high volumes of undifferentiated or low-value products. However, processors will constantly be looking to introduce higher valued parts or processed products. The domestic market focus is likely to be on developing partly or fully prepared products for both at-home use and restaurants. The emphasis for turkey processors is expected to be on the food service market and exports of turkey meat.

Production increases for poultry and eggs through the baseline period are expected to gradually slow to rates slightly above the rate of population increase. Poultry export markets are expected to continue to expand, but at a slower rate due to both the current general sluggishness in the world economy and the competitiveness of poultry exports from other countries.

Domestic per capita broiler consumption was flat between 1999 and 2001, but is projected to resume growth over the next decade, although at a slower pace than during the past 2 decades. Nonetheless, per capita broiler consumption increases to 84 pounds (retail-weight basis) by 2011, with broiler products gaining market share as per capita consumption of beef and pork decline.

After large increases in both 2000 and 2001, broiler export growth is expected to slow in 2002 and the following years, due to slower growth in personal incomes in the major importing countries and the strength of the dollar against many major currencies. In the longer term, domestic processors will also be faced with strong competition from other major broiler exporting countries, particularly Brazil. Exports to Asia are projected to expand through the baseline period, even with growing competition in most markets. While Russian imports are also expected to increase, the rate of growth is likely to be considerably lower than in the last several years.

Table egg production is forecast to expand between 1.3 and 1.5 percent per year during the baseline period, leaving per capita consumption to increase slightly each year. Production of hatching eggs for the laying and broiler breeder flocks is expected to increase at a slightly faster rate than overall egg production as broiler production continues to expand.

Per capita egg consumption is forecast to increase to about 277 eggs a year by the end of the baseline period. This is an increase of about 17 eggs from the estimate for 2001 and is a continuation of a trend, although at a slower rate, that saw per capita egg consumption growing by 20 eggs per person per year from 1997 to 2001. Processed egg products are forecast to be an increasing part of the egg market, in part due to fast food establishments expanding breakfast items which often incorporate egg products.

Wholesale shell egg prices are forecast to increase slowly during the baseline period, but remain basically flat after 2002 on a real basis.

### **Dairy**

Structural changes are expected to dominate milk production during coming years. Dairy farms are split into two rather distinct groups: traditional operations and large operations organized along industrial lines with labor divided into highly specialized tasks. The industrialized farms have been increasing in number and size at a fairly rapid rate, while many of the traditional farms have struggled to generate enough income for family living expenses.

Relatively high milk prices during most of 1996-2001 provided substantial cash reserves for families looking to expand or construct industrial-style dairy farms. Expansion by such units has been pronounced in western regions. However, development also has been brisk in certain parts of the Northeast and the Midwest. Long-run development of such farms will provide much of the upward trend in milk production.

Traditional dairy farms, particularly those with fewer than 75 cows, will remain under income stress, despite recent higher returns and direct Government support payments for milk and grain. These farmers will be faced with the choice of expanding, reducing their cost structures, or leaving dairying. Most of these farms will eventually exit the industry, continuing a long-term trend.

Better management, greater genetic potential, and inexpensive concentrate feeds will result in continued strong growth in milk per cow. However, the trend may not quite match the rate that similar milk-feed price ratios would have generated in the past. Producers today do not have as much flexibility to boost milk per cow with heavier grain feeding because of past increases in the starch content of rations and changes in feeding practices. In addition, differences between the milk per cow levels of expanding and exiting producers may be narrower than in the past.

A number of emerging or intensifying factors might affect changes in milk production. The size of the western dairy industry is expected to strain western alfalfa hay supplies to a greater extent than in the past. This may have implications for both farm expansion and milk per cow. On the

other hand, current tightness in replacement heifer supplies probably will ease as some management practices are adjusted in response to high heifer prices.

The process of building a new dairy farm or (to a lesser extent) expanding an existing unit is likely to become slower and more difficult. Environmental requirements have become much more stringent for all regions and sizes. In addition, rural and exurban neighbors have become much more aggressive about challenging large, particularly clusters of such, dairy farms on the basis of potential impacts on factors related to quality of life.

Domestic dairy demand is expected to grow slowly. Demand for cheese is projected to rise, although percentage increases in use may not be as large as those of the past. Cheese sales will benefit from the likely increased away-from-home eating and prepared foods. These trends will also help butter demand. Per capita consumption of fluid milk is projected to shrink slowly. Use of skim solids in processed foods will recover eventually as lower prices and demand for high quality products encourage use. In total, commercial use of dairy products is projected to rise slightly faster than the increase in population. But, slight declines in real prices probably will be needed in most years for commercial use to keep pace with production increases.

At some stage, the market for cheese is likely to begin maturing. Little or no growth in cheese sales would mark a major change in overall dairy product demand because of the very large share of the total that cheese now represents. However, there are yet to be any signs that such maturing has begun. Also, accelerated growth in the Hispanic American population should be generally positive for dairy demand.

This year's relatively strong international prices for nonfat dry milk are expected to ease slightly during the next couple of years, as European supplies become more available again. However, prices in the longer term are expected to trend upward as demand grows in Asia and Latin America. Demand growth in international butter markets is expected to be less than for milk powders, with prices rising only very slowly.

The United States is not projected to export substantial amounts of dairy products without subsidy, and levels of subsidized exports will be quite limited by WTO commitments. The gap between domestic and international prices probably will rule out sizable commercial exports except for brief periods. Even so, exports of whey products probably will grow, and niche markets may well continue to be developed successfully. Imports probably will be largely limited to amounts within TRQ's, as periods when over-TRQ imports are profitable are expected to be limited.

Farm milk prices are expected to be lower during the current and following marketing years because of rapid recovery in milk production and a somewhat soft economy. Prices are then expected to increase for a few years until a projected longer-run balance is reached. In general, long-run prices are expected to rise slightly less than the general rate of inflation. The price support program has been extended through May 2002.

Table 22. Per capita meat consumption, retail and boneless weight

Item	Units	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Retail weight:</b>													
Total beef	Pounds	69.4	68.1	65.7	64.2	63.4	63.6	63.1	62.7	62.2	62.2	62.2	62.6
Total veal	Pounds	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4
Total pork	Pounds	52.5	50.9	51.6	52.1	52.2	52.0	51.6	51.3	50.9	50.6	50.3	49.9
Lamb and mutton	Pounds	1.1	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0
Total red meat	Pounds	123.7	120.9	119.0	117.9	117.2	117.2	116.3	115.5	114.7	114.2	114.0	113.9
Broilers	Pounds	77.9	76.9	77.6	77.9	78.6	79.7	80.8	81.7	82.3	82.9	83.3	83.6
Other chicken	Pounds	1.1	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6
Turkeys	Pounds	17.8	17.8	18.2	18.6	18.9	19.1	19.3	19.4	19.5	19.6	19.6	19.6
Total poultry	Pounds	96.7	96.2	97.3	97.9	98.9	100.3	101.7	102.7	103.4	104.1	104.6	104.8
Red meat & poultry	Pounds	220.4	217.0	216.3	215.9	216.1	217.5	218.0	218.2	218.1	218.3	218.6	218.7
<b>Boneless weight:</b>													
Total beef	Pounds	65.7	64.5	62.2	60.8	60.0	60.3	59.7	59.3	58.9	58.9	58.9	59.3
Total veal	Pounds	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3
Total pork	Pounds	49.3	47.8	48.4	48.9	49.0	48.8	48.5	48.2	47.8	47.5	47.3	46.9
Lamb & mutton	Pounds	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7
Total red meat	Pounds	116.4	113.8	112.0	111.0	110.3	110.3	109.5	108.7	107.9	107.5	107.3	107.2
Broilers	Pounds	55.1	54.4	54.9	55.1	55.6	56.4	57.2	57.8	58.2	58.7	59.0	59.2
Other chicken	Pounds	0.7	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0
Turkeys	Pounds	14.0	14.0	14.4	14.7	14.9	15.1	15.3	15.3	15.4	15.5	15.5	15.5
Total poultry	Pounds	69.8	69.4	70.2	70.7	71.4	72.4	73.4	74.1	74.6	75.1	75.5	75.6
Red meat and poultry	Pounds	186.2	183.1	182.2	181.7	181.7	182.8	182.9	182.8	182.6	182.7	182.8	182.9

Table 23. Consumer expenditures for meats

Item	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Beef, dollars per person	212.97	229.53	223.90	219.91	221.82	222.49	224.01	226.22	228.46	230.80	232.98	235.67
Percent of income	0.83	0.86	0.82	0.77	0.74	0.71	0.68	0.66	0.64	0.61	0.59	0.57
Percent of meat expenditures	43.67	45.30	44.40	43.72	43.57	43.35	43.13	42.98	42.82	42.74	42.68	42.70
Pork, dollars per person	135.41	136.45	138.16	138.35	139.54	139.63	140.56	141.50	142.41	143.08	143.57	143.94
Percent of income	0.53	0.51	0.51	0.48	0.47	0.45	0.43	0.41	0.40	0.38	0.37	0.35
Percent of meat expenditures	27.77	26.93	27.40	27.50	27.41	27.21	27.06	26.88	26.69	26.50	26.30	26.08
Broilers, dollars per person	121.00	121.28	123.39	125.70	128.36	131.90	135.54	139.23	143.17	146.67	149.96	153.01
Percent of income	0.47	0.46	0.45	0.44	0.43	0.42	0.41	0.41	0.40	0.39	0.38	0.37
Percent of meat expenditures	24.81	23.94	24.47	24.99	25.21	25.70	26.10	26.45	26.83	27.16	27.47	27.72
Turkeys, dollars per person	18.30	19.38	18.84	19.09	19.35	19.18	19.28	19.39	19.49	19.49	19.43	19.32
Percent of income	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05
Percent of meat expenditures	3.75	3.83	3.74	3.79	3.80	3.74	3.71	3.68	3.65	3.61	3.56	3.50
Total meat, dollars per person	487.67	506.65	504.29	503.05	509.08	513.20	519.39	526.34	533.54	540.04	545.94	551.94
Percent of income	1.91	1.91	1.85	1.76	1.70	1.64	1.58	1.53	1.49	1.44	1.39	1.35



Table 24. Beef baseline

Item	Units	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Beginning stocks	Mil. lbs.	411	525	480	385	385	385	385	385	385	385	385	385
Commercial production	Mil. lbs.	26,777	26,048	25,325	24,959	24,829	25,152	25,450	25,732	25,962	26,336	26,799	27,307
Change from previous year	Percent	1.5	-2.7	-2.8	-1.4	-0.5	1.3	1.2	1.1	0.9	1.4	1.8	1.9
Farm production	Mil. lbs.	111	106	106	106	106	106	106	106	106	106	106	106
Total production	Mil. lbs.	26,888	26,154	25,431	25,065	24,935	25,258	25,556	25,838	26,068	26,442	26,905	27,413
Imports	Mil. lbs.	3,032	3,089	3,125	3,300	3,400	3,500	3,300	3,100	3,000	2,900	2,800	2,700
Total supply	Mil. lbs.	30,331	29,768	29,036	28,750	28,720	29,143	29,241	29,323	29,453	29,727	30,090	30,498
Exports	Mil. lbs.	2,516	2,248	2,340	2,425	2,525	2,625	2,725	2,800	2,875	2,975	3,075	3,125
Ending stocks	Mil. lbs.	525	480	385	385	385	385	385	385	385	385	385	385
Total consumption	Mil. lbs.	27,290	27,040	26,311	25,940	25,810	26,133	26,131	26,138	26,193	26,367	26,630	26,988
Per capita, carcass weight	Pounds	99.1	97.3	93.8	91.7	90.5	90.9	90.1	89.5	88.9	88.8	88.9	89.4
Per capita, retail weight	Pounds	69.4	68.1	65.7	64.2	63.4	63.6	63.1	62.7	62.2	62.2	62.2	62.6
Change from previous year	Percent	0.4	-1.8	-3.6	-2.2	-1.3	0.4	-0.9	-0.7	-0.7	-0.1	0.1	0.6

## Prices:

Beef cattle, farm	\$/cwt	68.37	71.63	76.48	76.63	78.10	78.74	80.40	82.04	83.82	85.19	86.40	87.43
Calves, farm	\$/cwt	105.67	107.53	110.11	103.72	101.99	103.06	103.69	105.93	107.38	108.09	108.20	109.16
Choice steers, Nebraska	\$/cwt	69.65	73.37	78.25	78.40	79.91	80.56	82.26	83.94	85.76	87.17	88.40	89.46
Deflated price	\$/cwt	40.45	41.36	43.21	42.29	41.99	41.27	41.07	40.85	40.68	40.30	39.84	39.29
Yearling steers, Okla. City	\$/cwt	86.17	88.86	91.00	85.72	84.29	85.17	85.69	87.55	88.74	89.33	89.42	90.22
Deflated price	\$/cwt	50.04	50.09	50.25	46.23	44.29	43.63	42.78	42.60	42.10	41.30	40.30	39.62
Retail: Beef and veal	1982-84=100	148.1	160.5	164.5	165.3	168.9	168.7	171.3	174.2	177.1	179.1	180.6	181.7
Retail: Other meats	1982-84=100	152.0	155.9	159.0	159.7	163.3	163.0	165.6	168.4	171.2	173.1	174.6	175.6
ERS retail beef	\$/lb.	3.07	3.37	3.41	3.43	3.50	3.50	3.55	3.61	3.67	3.71	3.74	3.77

## Costs and returns, cow-calf enterprise:

Variable expenses	\$/cow	194.98	201.57	210.12	213.99	219.30	224.20	230.16	235.24	242.55	248.10	255.25	259.77
Fixed expenses	\$/cow	121.92	124.71	120.98	120.42	129.02	135.23	138.12	141.19	144.45	147.84	151.38	154.95
Total cash expenses	\$/cow	316.90	326.29	331.09	334.40	348.32	359.43	368.28	376.43	387.00	395.94	406.62	414.71
Returns above cash costs	\$/cow	72.20	82.14	95.41	74.64	61.26	59.23	58.97	65.87	67.55	68.02	64.36	66.69
Cattle inventory	1,000 head	98,198	97,309	96,551	95,847	95,875	96,811	97,762	98,715	99,716	101,127	102,696	104,363
Beef cow inventory	1,000 head	33,569	33,400	33,110	33,029	32,946	33,597	34,181	34,786	35,460	36,250	37,091	37,950
Total cow inventory	1,000 head	42,759	42,603	42,175	42,019	41,856	42,427	42,941	43,466	44,070	44,790	45,551	46,340

Table 25. Pork baseline

Item	Units	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Beginning stocks	Mil. lbs.	489	477	450	500	500	500	500	500	500	500	500	500
Commercial production	Mil. lbs.	18,928	18,809	19,125	19,446	19,665	19,775	19,836	19,884	19,967	20,039	20,124	20,183
Change from previous year	Percent	-1.8	-0.6	1.7	1.7	1.1	0.6	0.3	0.2	0.4	0.4	0.4	0.3
Farm production	Mil. lbs.	24	30	30	30	30	30	30	30	30	30	30	30
Total production	Mil. lbs.	18,952	18,839	19,155	19,476	19,695	19,805	19,866	19,914	19,997	20,069	20,154	20,213
Imports	Mil. lbs.	967	915	960	985	1,010	1,030	1,050	1,070	1,085	1,100	1,110	1,120
Total supply	Mil. lbs.	20,408	20,231	20,565	20,961	21,205	21,335	21,416	21,484	21,582	21,669	21,764	21,833
Exports	Mil. lbs.	1,305	1,541	1,430	1,475	1,525	1,575	1,625	1,675	1,750	1,800	1,850	1,925
Ending stocks	Mil. lbs.	477	450	500	500	500	500	500	500	500	500	500	500
Total consumption	Mil. lbs.	18,626	18,240	18,635	18,986	19,180	19,260	19,291	19,309	19,332	19,369	19,414	19,408
Per capita, carcass weight	Pounds	67.6	65.6	66.4	67.1	67.2	67.0	66.5	66.1	65.6	65.2	64.8	64.3
Per capita, retail weight	Pounds	52.5	50.9	51.6	52.1	52.2	52.0	51.6	51.3	50.9	50.6	50.3	49.9
Change from previous year	Percent	-2.6	-3.0	1.3	1.0	0.2	-0.4	-0.6	-0.7	-0.7	-0.6	-0.6	-0.8

## Prices:

Hogs, farm	\$/cwt	42.86	45.40	42.76	42.74	42.79	43.01	43.79	44.66	45.44	46.12	46.69	47.42
National base, live equivalent	\$/cwt	44.70	47.23	44.50	45.47	45.52	45.76	46.59	47.51	48.34	49.07	49.67	50.45
Deflated price	\$/cwt	25.96	26.62	24.57	24.52	23.92	23.44	23.26	23.12	22.93	22.69	22.38	22.16
Retail: pork	1982-84=100	156.5	162.2	163.3	161.9	163.0	163.7	165.9	168.1	170.4	172.3	173.9	175.8
ERS retail pork	\$/lb.	2.58	2.68	2.68	2.66	2.67	2.69	2.72	2.76	2.80	2.83	2.85	2.88

## Costs and returns, farrow to finish:

Variable expenses	\$/cwt	29.39	28.61	29.05	28.86	29.21	29.49	30.12	30.49	31.50	31.92	32.82	32.87
Fixed expenses	\$/cwt	5.26	5.25	5.04	4.99	5.32	5.56	5.67	5.78	5.90	6.02	6.16	6.31
Total cash expenses	\$/cwt	34.65	33.86	34.09	33.84	34.54	35.05	35.79	36.27	37.40	37.94	38.99	39.18
Returns above cash costs	\$/cwt	10.05	13.37	10.41	11.62	10.98	10.70	10.80	11.24	10.94	11.13	10.68	11.27

## Hog inventory,

Dec. 1, previous year	1,000 head	59,342	59,138	59,400	60,332	60,969	61,289	61,464	61,603	61,846	62,053	62,301	62,473
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Table 26. Young chicken baseline

Item	Units	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Beginning stocks	Mil. lbs.	796	798	675	740	740	740	740	740	740	740	740	740
Federally inspected slaughter	Mil. lbs.	30,495	30,998	31,800	32,167	32,731	33,443	34,188	34,886	35,469	36,008	36,494	36,927
Change from previous year	Percent	2.5	1.6	2.6	1.2	1.8	2.2	2.2	2.0	1.7	1.5	1.3	1.2
Production	Mil. lbs.	30,209	30,673	31,460	31,823	32,381	33,086	33,822	34,513	35,089	35,623	36,104	36,532
Total supply	Mil. lbs.	31,011	31,479	32,143	32,571	33,129	33,834	34,570	35,261	35,837	36,371	36,852	37,280
Change from previous year	Percent	2.7	1.5	2.1	1.3	1.7	2.1	2.2	2.0	1.6	1.5	1.3	1.2
Exports	Mil. lbs.	5,548	6,193	6,350	6,464	6,590	6,715	6,881	7,048	7,191	7,293	7,403	7,509
Ending stocks	Mil. lbs.	798	675	740	740	740	740	740	740	740	740	740	740
Consumption	Mil. lbs.	24,665	24,611	25,053	25,367	25,800	26,379	26,950	27,473	27,906	28,338	28,709	29,031
Per capita, carcass weight	Pounds	89.6	88.5	89.3	89.6	90.4	91.7	93.0	94.0	94.7	95.4	95.9	96.2
Per capita, retail weight	Pounds	77.9	76.9	77.6	77.9	78.6	79.7	80.8	81.7	82.3	82.9	83.3	83.6
Change from previous year	Percent	0.0	-1.2	0.9	0.3	0.9	1.4	1.4	1.1	0.7	0.7	0.5	0.3
Prices:													
Broilers, farm	Cents/lb.	34.3	39.8	40.4	41.0	41.7	42.2	42.5	42.9	43.5	43.9	44.2	44.5
12-city market price	Cents/lb.	56.2	59.0	60.3	61.2	62.3	63.0	63.4	64.0	64.9	65.5	66.0	66.5
Deflated wholesale price	Cents/lb.	32.6	33.3	33.3	33.0	32.7	32.3	31.7	31.1	30.8	30.3	29.7	29.2
Change from previous year	Percent	-6.4	1.9	0.1	-0.9	-0.8	-1.4	-2.0	-1.6	-1.1	-1.7	-1.7	-1.9
Composite retail broiler price	Cents/lb.	155.4	157.7	159.0	161.4	163.4	165.5	167.7	170.4	174.0	176.9	179.9	183.0
Costs and returns:													
Total costs	Cents/lb.	45.99	45.57	47.04	47.51	48.85	49.57	50.83	51.66	53.46	54.33	55.93	56.24
Net returns	Cents/lb.	10.21	13.43	13.26	13.68	13.43	13.45	12.57	12.33	11.48	11.15	10.08	10.22

Table 27. Turkey baseline

Item	Units	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Beginning stocks	Mil. lbs.	254	241	250	275	275	275	275	275	275	275	275	275
Federally inspected slaughter	Mil. lbs.	5,402	5,510	5,700	5,837	5,976	6,109	6,214	6,308	6,395	6,470	6,537	6,589
Change from previous year	Percent	2.0	2.0	3.4	2.4	2.4	2.2	1.7	1.5	1.4	1.2	1.0	0.8
Production	Mil. lbs.	5,333	5,439	5,625	5,760	5,898	6,028	6,132	6,225	6,311	6,385	6,451	6,502
Total supply	Mil. lbs.	5,588	5,681	5,876	6,036	6,174	6,304	6,408	6,501	6,587	6,661	6,727	6,778
Change from previous year	Percent	1.0	1.7	3.4	2.7	2.3	2.1	1.7	1.4	1.3	1.1	1.0	0.8
Exports	Mil. lbs.	458	492	495	505	514	525	536	549	560	569	578	584
Ending stocks	Mil. lbs.	241	250	275	275	275	275	275	275	275	275	275	275
Consumption	Mil. lbs.	4,889	4,939	5,106	5,257	5,385	5,505	5,598	5,677	5,752	5,817	5,874	5,919
Per capita	Pounds	17.8	17.8	18.2	18.6	18.9	19.1	19.3	19.4	19.5	19.6	19.6	19.6
Change from previous year	Percent	-1.1	0.1	2.5	2.0	1.6	1.4	0.9	0.6	0.5	0.3	0.2	0.0
Prices:													
Turkey, farm	Cents/lb.	41.5	39.2	40.1	40.7	40.6	39.7	39.5	39.5	39.5	39.4	39.2	39.0
Hen turkey (whsle.) East	Cents/lb.	70.5	66.7	68.3	67.8	67.7	66.1	65.9	65.9	65.9	65.7	65.4	65.0
Deflated hen turkey	Cents/lb.	40.9	37.6	37.7	36.6	35.6	33.9	32.9	32.0	31.3	30.4	29.5	28.5
Retail frozen turkey	Cents/lb.	103.1	109.1	103.5	102.8	102.5	100.2	99.9	99.8	99.8	99.5	99.0	98.5
Retail: poultry	1982-84=100	159.8	163.9	165.8	167.6	169.2	170.2	171.8	174.1	177.0	179.2	181.5	183.8
Costs and returns:													
Total costs	Cents/lb.	57.91	57.99	58.63	58.84	59.58	60.24	61.00	61.54	62.57	63.11	64.03	64.27
Net returns	Cents/lb.	12.59	8.71	9.67	8.97	8.09	5.89	4.90	4.32	3.31	2.56	1.33	0.73

Table 28. Egg baseline

Item	Units	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Beginning stocks	Mil. doz.	8	11	13	12	11	10	10	10	10	10	10	10
Production	Mil. doz.	7,035	7,151	7,270	7,379	7,490	7,602	7,716	7,824	7,934	8,037	8,141	8,247
Change from previous year	Percent	1.8	1.6	1.7	1.5	1.5	1.5	1.5	1.4	1.4	1.3	1.3	1.3
Imports	Mil. doz.	8	9	8	8	8	8	8	8	8	8	8	8
Total supply	Mil. doz.	7,051	7,172	7,291	7,399	7,509	7,620	7,734	7,842	7,952	8,055	8,159	8,265
Change from previous year	Percent	1.8	1.7	1.7	1.5	1.5	1.5	1.5	1.4	1.4	1.3	1.3	1.3
Hatching use	Mil. doz.	940	952	975	986	1,000	1,016	1,032	1,045	1,057	1,068	1,077	1,086
Exports	Mil. doz.	172	175	165	170	175	180	185	190	195	200	205	210
Ending stocks	Mil. doz.	11	13	12	11	10	10	10	10	10	10	10	10
Consumption	Mil. doz.	5,928	6,031	6,139	6,232	6,323	6,414	6,507	6,597	6,690	6,777	6,867	6,959
Per capita	Number	258.3	260.3	262.6	264.3	266.0	267.6	269.4	270.9	272.5	273.8	275.2	276.7
Change from previous year	Percent	1.0	0.8	0.9	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.5	0.5
Prices:													
Eggs, farm	Cents/doz.	63.8	62.9	61.3	63.2	64.6	66.0	67.9	69.8	71.6	73.9	76.3	78.1
New York, Grade A large	Cents/doz.	68.9	68.9	66.0	68.0	69.5	71.0	73.0	75.0	77.0	79.5	82.0	84.0
Deflated wholesale prices	Cents/doz.	40.0	38.8	36.4	36.7	36.5	36.4	36.4	36.5	36.5	36.8	37.0	36.9
Retail, Grade A, large	Cents/doz.	91	93	91	92	94	96	98	100	103	106	109	112
Retail: Eggs	1982-84=100	131.9	137.0	138.0	141.1	144.9	148.8	153.6	158.5	163.4	169.2	175.2	180.1
Costs and returns:													
Total costs	Cents/doz.	62.03	61.46	63.44	64.08	65.89	67.53	69.92	71.76	74.95	76.87	79.84	81.00
Net returns	Cents/doz.	6.87	7.44	2.56	3.92	3.61	3.47	3.08	3.24	2.05	2.63	2.16	3.00

Table 29. Dairy baseline

Item	Units	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Production data:													
Number of cows	1,000	9,149	9,080	9,015	8,920	8,865	8,805	8,740	8,685	8,620	8,560	8,495	8,430
Milk per cow	Pounds	18,065	18,600	19,050	19,495	19,855	20,255	20,670	21,145	21,500	21,945	22,365	22,840
Milk production	Bil. lbs.	165.3	168.9	171.7	173.9	176.0	178.3	180.7	183.6	185.3	187.8	190.0	192.5
Commercial use:													
Milkfat basis	Bil. lbs.	169.3	172.9	173.8	176.2	178.3	180.9	183.2	186.3	188.0	190.6	192.7	195.3
Skim solids	Bil. lbs.	163.5	169.1	173.8	175.8	177.9	180.2	182.6	185.8	187.4	189.9	192.3	194.7
Net removals:													
Milkfat basis	Bil. lbs.	0.3	0.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Skim solids	Bil. lbs.	6.3	2.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Prices:													
All milk	\$/cwt	14.48	13.40	13.45	13.80	14.10	14.55	14.70	14.95	15.40	15.50	15.95	16.15
Manufactured milk value <sup>1</sup>	\$/cwt	12.85	11.95	12.25	12.65	12.85	13.30	13.40	13.65	14.05	14.15	14.55	14.75
Retail, all dairy products	1982-84=100	164.7	171.0	174.5	178.5	183.0	188.0	192.0	196.0	201.5	205.5	210.5	215.5
Costs and returns:													
Ration value	\$/cwt	7.14	7.35	7.30	7.45	7.60	7.75	7.90	8.15	8.30	8.55	8.60	8.70
Returns above concentrate costs	\$/cwt	11.52	10.35	10.42	10.71	10.95	11.33	11.42	11.57	11.96	11.95	12.38	12.54
Milk-feed ratio	ratio	2.03	1.82	1.84	1.85	1.86	1.88	1.86	1.83	1.86	1.81	1.85	1.86

1/ Estimated value of milk used in manufactured products.

## **Farm Income and Farm Financial Conditions**

Net farm income has been maintained near the average of the 1990s over the past few years largely by sizable direct government payments to the sector that balanced lower cash receipts during this period of generally low crop prices. Government payments are projected to decline in the baseline, leading to an initial drop in farm income, but then as commodity prices and market receipts recover, net farm income rises through the remainder of the projections.

### **Net Farm Income and Government Payments**

Net farm income prospects for the next decade are on par with the decade of the 1990s. With the production, prices, and government payments projected in the baseline, net farm income during 2001-2011 is expected to average \$47.3 billion compared with \$47.0 billion during 1990-2000. Net farm income initially declines in the baseline to a low of \$40.6 billion in 2002 then gradually increases through the rest of the baseline as farm prices strengthen over the decade. By the end of the projections, income exceeds the record of \$54.9 billion set in 1996, a year of both exceptional harvests and market opportunities.

Total cash receipts from farm sales are expected to reach \$204 billion in 2002 for the first time since 1997. But government payments are projected to be considerably less in 2002 and beyond. Total government payments, forecast at \$21.1 billion for 2001, fall to \$10.7 billion in 2002 and \$9.8 billion in 2003, then decline to around \$7 billion throughout the rest of the baseline period. Under existing farm legislation, production flexibility payments were mandated to trend downward according to a declining fixed allocation budgeted for each successive year of the program. Production flexibility contract payments are assumed to continue at their 2002 level through the remainder of the baseline.

Marketing loan benefits (loan deficiency payments and marketing loan gains), which are intended to be countercyclical with commodity prices, are also projected to have reduced importance as a component of government assistance. Lower prices experienced in recent years reduce loan rates for many commodities in 2002 and beyond as the baseline assumes a return to market-price based, formula determination of loan rates for corn, wheat, and soybeans, lowering loan rates for other feed grains and other oilseeds, as well. The combination of lower loan rates and increasing market prices results in smaller per-unit payment rates in the baseline as well as declining overall marketing loan benefits.

Provisions of the Omnibus Consolidated and Emergency Supplemental Appropriations Act for Fiscal Year 1999 and the Agricultural Appropriations Act of 2000 and 2001 provided supplemental assistance in the form of market loss and crop loss payments, adding to gross income in 1998-2001. On a calendar-year basis, these programs added \$2.8 billion to farm revenues in 1998, \$7.8 billion in 1999, \$8.5 billion in 2000, and about \$9.1 billion in 2001. There are no emergency supplemental assistance payments forecast in the baseline.

In total, direct government payments to the farm sector will be down about \$10 billion in 2002 from 2001. Government payments then continue to be a less important component of farm sector income through the rest of the decade.

## **Farm Cash Receipts**

Following a reduction in global trade and U.S. exports at the end of the 1990s, baseline projections indicate exports returning to steady growth through the coming decade. Prices and cash receipts are expected to rise as exports expand. Total cash receipts from sales of farm commodities can be expected to grow at nearly 3 percent per year from 2002 onward. This expected growth will raise projected cash receipts from \$204 billion in 2002 to \$261 billion by 2011.

Overall, total crop output expands through the baseline. Additionally, recovering crop prices will be important to expanding crop receipts over the next decade. By 2011, crop cash receipts are projected to be \$133 billion as compared with the \$98 billion forecast for 2002. After adjusting for inflation, crop receipts (in 1996 dollars) range between \$88 and \$96 billion throughout the baseline, remaining well below the \$109 billion record of 1997.

Livestock receipts, in contrast to crops, are forecast at a near-record level of \$106 billion for 2002 and will likely continue to grow to \$128 billion by 2011. The gain in livestock receipts in the baseline is less than increases expected for crop receipts.

## **Farm Production Expenses**

Farm production expenses are expected to grow modestly over the entire baseline. Total expenses increase only modestly from 2001 to 2002. From 2002 forward, total expenses rise more steadily. In 2011, they are projected to stand \$42 billion higher than in 2001, a 21-percent increase. However, in GDP-deflated dollars, total expenses are projected to be 4.3 percent (\$7.8 billion) lower in 2011 than in 2001. Deflated expenses peaked in 1997 and have been falling since then.

Cash operating margins tighten between 2002 and 2005 as total cash expenses range between 78 and 79 percent of gross cash income. After 2005, they gradually improve, falling to 76 percent in 2011. Throughout the decade, cash operating margins are above or at about the same level as in the early 1980s, the previous high point.

Low commodity prices during the past few years have made operators more conscious of the costs associated with producing their output. Even as commodity prices rise over the period covered by the baseline, farmers will continue to adjust their costs due to more uncertain income prospects. These efforts will be somewhat hampered, however, by price increases for production items.

No individual expense falls during the baseline period in nominal dollars. The largest percentage increases will be in interest expenses, net rent to nonoperators, and other operating expenses (comprised of marketing, storage, and transportation, and miscellaneous expenses). These expenses each increase more than the general inflation rate.

Feed purchases began to move upward again in 2001 after retreating from a peak in 1997. In both 2001 and 2002, they are forecast to increase more than 7 percent in each year. In the years following 2002, the percentage increases are steady but more modest. In 2011, feed expenses are projected to be \$6.6 billion higher than their low point in 2000. These increases will occur as the cattle cycle is projected to move into its expansion phase in 2003-2004, the production of other animal products increase, and feed crop prices rise.

Fuel and oil expenses in the near term are lower than the recent peak in 2000 as oil prices have fallen over the past year. Overall costs of fuel and oil are expected to increase over the decade due to rising oil prices and expanded planted acreage. Larger equipment and machinery-saving field crop practices such as no-till cultivation will restrain these cost increases somewhat.

All crop-related expenses (seeds, fertilizer, and pesticides) will increase during the baseline period, reflecting higher prices and recovery in area planted. Pesticide expenses will increase the most, \$2.2 billion (26 percent). Even so, deflated pesticide expenses will be almost the same in 2011 as they were in 2001. One of the factors driving pesticide expenditures is the wider adoption of no-till cultivation, which requires a greater use of herbicides. Other changes in technology and in cropping practices will also affect quantities purchased of agricultural inputs.

Labor expenses, which constitute about 11 percent of total production costs, are expected to be \$5.6 billion (26.6 percent) higher in 2011 than in 2001. They are slated to increase between 2 and 3 percent annually, due primarily to a consistent rise in farm wage rates.

Interest expenses are projected to rise more than any other expense from 2001 to 2011. The 34-percent (\$5.0 billion) increase will be the result of higher real estate interest rates and greater overall borrowing. Current low prices and expected receipts have prompted farmers to manage debt more carefully and lenders to be cautious in offering credit. Even so, improvements in returns over the next decade will produce lower debt/asset and debt/equity ratios and result in heavier borrowing throughout the period. Total debt is expected to increase about 2 percent per year. Interest expenses will actually fall in 2002 and 2003 as a result of lower interest rates before rising in 2004 and 2005 as a result of an anticipated jump in interest rates in those years. After 2005, interest expenses increase around 2 percent each year, almost entirely due to higher debt levels. As a share of production costs, interest payments, which averaged 13 percent in the 1980s and 7.1 percent in the 1990s, are expected to increase to 7.7 percent over the next decade.

A decline in net rent to nonoperators in 2002 is largely due to the reduction in government payments included in the baseline, mostly reflecting the assumption of no additional ad hoc assistance. With slowly declining government payments projected after 2002 and increasing crop receipts and planted acreage, net rent rebounds in 2003 and increases an average of 4.1 percent per year through 2011. Between 2001 and 2011, net rent rises 33.4 percent (\$5.4 billion), the second largest increase in expenses during the period.

## **Farm Balance Sheet**

With reduced farm income and cash flow over the next few years, debt management will be crucial to the financial condition of the agricultural sector. Even with the near-term cash flow difficulties facing the sector, a strong basic financial position achieved during the 1990s will help farmers. In the longer run, increasing farm incomes and relatively low interest rates will contribute to asset accumulation and assist in debt management, thus leading to an improving balance sheet.

The value of farm real estate, the largest component of farm assets, is expected to increase more slowly in the next few years as lower potential government payments keep increases in land values low. Average farmland values per acre are forecast to rise modestly on a nationwide basis despite near-term projected declines in farm income. In the past, the value of farmland has been slow to respond to decreases in farm income. Further, pressures from non-agricultural sources such as housing and recreational uses also affect farmland values.

Farm business debt is projected to rise 1.9 percent in 2002, following a 4.8-percent increase in 2001. Thereafter, with farm incomes reflecting greater dependence on market forces and less reliance on government payments, debt growth is expected to average between 1.5 and 2.5 percent through 2011.

The projected gains in farmland value and agricultural assets combined with the moderate growth projected for farm business debt suggest that the financial balance sheet of the aggregate farm sector should weather the near-term projected decline in net cash income and end the baseline period in a strong position. The debt-to-asset ratio for the sector improves from 16.0 percent in 2002 to 14.9 percent in 2011.

Table 30. Farm receipts, expenses, and incomes in nominal dollars

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<i>Billion dollars</i>												
Cash receipts:												
Crops	94.1	95.8	97.9	102.1	105.4	109.0	113.0	117.6	122.1	126.2	130.0	133.4
Livestock and products	99.5	106.1	106.4	106.4	107.9	109.7	112.9	115.8	118.8	122.0	124.6	127.6
All commodities	193.6	201.9	204.3	208.5	213.3	218.7	225.9	233.4	240.9	248.2	254.6	261.0
Farm-related income	13.6	13.7	13.6	13.8	14.0	14.3	14.5	14.8	15.0	15.3	15.5	15.8
Government payments	22.9	21.1	10.7	9.8	8.7	7.6	7.1	7.0	7.0	6.9	6.9	6.8
Gross cash income	230.1	236.7	228.6	232.0	236.0	240.6	247.5	255.1	262.9	270.4	277.0	283.6
Cash expenses	172.6	177.2	177.6	179.5	184.7	189.5	193.7	197.9	202.8	207.3	212.1	216.7
Net cash income	57.5	59.5	50.9	52.5	51.3	51.1	53.8	57.2	60.1	63.1	64.9	66.8
Value of inventory change	0.5	0.9	0.9	0.3	1.3	1.3	1.3	1.1	1.4	1.6	1.6	1.6
Non-money income	11.0	11.1	11.2	11.3	11.5	11.8	12.0	12.3	12.5	12.8	13.1	13.4
Gross farm income	241.5	248.6	240.6	243.6	248.8	253.6	260.8	268.5	276.9	284.8	291.7	298.5
Noncash expenses	16.6	16.3	16.4	16.6	16.7	16.9	17.0	17.2	17.4	17.5	17.7	17.9
Operator dwelling expenses	5.8	5.9	6.0	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8
Total production expenses	195.1	199.4	200.0	202.2	207.6	212.6	217.0	221.5	226.7	231.4	236.5	241.4
Net farm income	46.4	49.3	40.6	41.4	41.2	41.0	43.8	47.0	50.2	53.4	55.2	57.2
Farm assets	1,188.3	1,216.6	1,228.1	1,247.7	1,284.0	1,314.2	1,347.0	1,385.7	1,430.8	1,478.8	1,527.4	1,577.1
Farm debt	184.0	192.8	196.5	199.5	202.5	205.5	209.6	213.8	218.1	223.6	229.1	234.9
Farm equity	1,004.3	1,023.8	1,031.6	1,048.2	1,081.5	1,108.6	1,137.4	1,171.9	1,212.7	1,255.2	1,298.2	1,342.2
<i>Percent</i>												
Debt/equity ratio	18.3	18.8	19.1	19.0	18.7	18.5	18.4	18.2	18.0	17.8	17.7	17.5
Debt/assets ratio	15.5	15.8	16.0	16.0	15.8	15.6	15.6	15.4	15.2	15.1	15.0	14.9

Table 31. Farm receipts, expenses, and incomes in 1996 dollars

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<i>Billion 1996 dollars<sup>1</sup></i>												
Cash receipts:												
Crops	87.9	87.6	87.9	89.9	90.5	91.3	92.4	93.8	95.0	95.8	96.3	96.4
Livestock and products	92.9	97.0	95.6	93.6	92.6	92.0	92.3	92.4	92.5	92.6	92.3	92.2
All commodities	180.9	184.5	183.4	183.5	183.2	183.3	184.7	186.1	187.5	188.4	188.6	188.6
Farm-related income	12.7	12.5	12.2	12.1	12.0	11.9	11.9	11.8	11.7	11.6	11.5	11.4
Government payments	21.4	19.3	9.6	8.6	7.5	6.4	5.8	5.6	5.4	5.3	5.1	4.9
Gross cash income	215.0	216.4	205.2	204.2	202.7	201.6	202.3	203.5	204.6	205.2	205.2	204.9
Cash expenses	161.3	162.0	159.5	158.1	158.6	158.8	158.3	157.9	157.8	157.3	157.1	156.6
Net cash income	53.7	54.4	45.8	46.2	44.0	42.8	44.0	45.6	46.8	47.9	48.1	48.3
Value of inventory change	0.4	0.8	0.8	0.3	1.1	1.1	1.1	0.9	1.1	1.2	1.2	1.2
Non-money income	10.2	10.1	10.0	9.9	9.9	9.9	9.8	9.8	9.7	9.7	9.7	9.7
Gross farm income	225.7	227.3	216.1	214.5	213.7	212.5	213.2	214.1	215.4	216.2	216.1	215.7
Noncash expenses	15.6	14.9	14.8	14.6	14.4	14.1	13.9	13.7	13.5	13.3	13.1	12.9
Operator dwelling expenses	5.4	5.4	5.4	5.3	5.3	5.2	5.2	5.1	5.1	5.0	5.0	4.9
Total production expenses	182.3	182.3	179.6	178.0	178.3	178.2	177.4	176.7	176.4	175.6	175.2	174.4
Net farm income	43.4	45.0	36.5	36.5	35.4	34.4	35.8	37.5	39.0	40.6	40.9	41.3
Farm assets	1,110.1	1,112.2	1,102.8	1,098.4	1,102.8	1,101.2	1,101.1	1,105.2	1,113.3	1,122.6	1,131.2	1,139.5
Farm debt	171.9	176.3	176.5	175.6	173.9	172.2	171.4	170.5	169.7	169.7	169.7	169.7
Farm equity	938.2	935.9	926.3	922.8	928.9	929.0	929.8	934.7	943.6	952.9	961.5	969.8

1/ Nominal dollar values divided by the GDP chain-type price index.



## **Food Prices and Expenditures**

The Consumer Price Index (CPI) for food is projected to rise moderately in the baseline, increasing at an average rate of about 2.1 percent from 2001 to 2011. This compares to a 2.5-percent average rise expected in the CPI for all items, continuing a long-term trend of food prices increasing at slightly less than the general inflation rate. Moderate but steady economic growth with sustained increases in disposable personal income will have a positive impact on consumer demand for food.

Increases in prices for food away from home, which contain a large service component, are being held down by competition in the food industry. As a result, away-from-home prices rise at a moderate annual average rate of about 2.2 percent from 2001 to 2011. Prices for food at home increase about 2.1 percent per year. For foods purchased for consumption at home, the strongest price increases generally occur among the more highly processed foods such as cereals and bakery products. Prices for these foods are related more to the costs of processing and marketing than to the costs of farm commodities and, therefore, rise at a rate closer to the general inflation rate.

Total food expenditures rise at a 3.7-percent average annual rate in the baseline. Expenditures for meals eaten away from home account for a growing share of food spending, reaching nearly 50 percent of total food expenditures by 2011. Growth in expenditures for food eaten away from home will average 4.2 percent a year while expenditures for food at home will rise 3.3 percent annually.

Table 32. Consumer food price indexes and food expenditures baseline

CPI category	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Consumer price indexes:</b>													
	<i>1982-84=100</i>												
All food	164.1	167.9	173.4	177.5	180.7	184.7	188.3	192.5	196.8	201.1	205.5	209.8	214.3
Food away from home	165.1	169.0	173.9	179.3	182.7	186.6	190.4	194.4	198.4	202.5	206.7	211.0	215.4
Food at home	164.2	167.9	173.8	177.0	180.1	184.2	187.7	192.1	196.5	201.1	205.6	209.9	214.4
Meats	142.3	150.7	159.4	162.4	162.6	165.4	165.5	168.0	170.6	173.3	175.3	176.8	178.1
Beef and veal	139.2	148.1	160.5	164.5	165.3	168.9	168.7	171.3	174.2	177.1	179.1	180.6	181.7
Pork	145.9	156.5	162.2	163.3	161.9	163.0	163.7	165.9	168.1	170.4	172.3	173.9	175.8
Other meats	148.2	152.0	155.9	159.0	159.7	163.3	163.0	165.6	168.4	171.2	173.1	174.6	175.6
Poultry	157.9	159.8	163.9	165.8	167.6	169.2	170.2	171.8	174.1	177.0	179.2	181.5	183.8
Fish and seafood	185.3	190.4	191.0	195.8	200.7	205.7	210.8	216.1	221.5	227.0	232.7	238.5	244.5
Eggs	128.1	131.9	137.0	138.0	141.1	144.9	148.8	153.6	158.5	163.4	169.2	175.2	180.1
Dairy products	159.6	160.7	167.0	171.5	175.5	179.5	184.0	189.0	193.0	197.5	202.5	206.5	212.0
Fats and oils	148.3	147.5	156.0	159.6	163.4	167.5	171.8	176.3	180.6	185.1	189.9	194.5	199.6
Fruits and vegetables	203.1	204.6	212.0	215.7	220.0	225.8	231.7	237.8	243.8	249.9	256.0	262.2	268.5
Sugar and sweets	152.3	154.0	155.9	158.7	162.3	163.8	166.4	169.8	173.7	178.8	181.6	186.4	190.9
Cereals and bakery products	185.0	188.3	193.8	197.9	202.0	207.2	211.9	217.5	224.1	230.1	236.2	242.3	248.6
Nonalcoholic beverages	134.3	137.8	139.3	139.7	143.2	146.8	150.5	154.3	158.2	162.2	166.3	170.5	174.8
Other foods	168.9	172.2	176.1	179.6	183.7	188.4	193.1	198.0	202.9	207.9	213.1	218.4	223.9
<b>Food expenditures:</b>													
	<i>Billion dollars</i>												
All food	779.0	821.9	855.1	888.6	918.0	953.0	988.5	1,026.1	1,065.1	1,105.3	1,146.0	1,188.3	1,232.6
Food at home	414.8	436.5	450.6	463.4	476.3	493.0	509.9	527.9	546.7	565.8	584.5	603.9	624.3
Food away from home	364.2	385.4	404.5	425.2	441.7	460.0	478.6	498.2	518.4	539.5	561.5	584.4	608.3

Table 33. Changes in consumer food prices, baseline

CPI category	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
	<i>Percent</i>												
All food	2.1	2.3	3.3	2.4	1.8	2.2	1.9	2.2	2.2	2.2	2.2	2.1	2.1
Food away from home	2.5	2.4	2.9	3.1	1.9	2.1	2.0	2.1	2.1	2.1	2.1	2.1	2.1
Food at home	1.9	2.3	3.5	1.8	1.8	2.3	1.9	2.3	2.3	2.3	2.2	2.1	2.1
Meats	0.5	5.9	5.8	1.9	0.1	1.7	0.1	1.5	1.5	1.6	1.2	0.9	0.7
Beef and veal	2.0	6.4	8.4	2.5	0.5	2.2	-0.1	1.5	1.7	1.7	1.1	0.8	0.6
Pork	-1.8	7.3	3.6	0.7	-0.9	0.7	0.4	1.3	1.3	1.4	1.1	0.9	1.1
Other meats	1.0	2.6	2.6	2.0	0.4	2.3	-0.2	1.6	1.7	1.7	1.1	0.9	0.6
Poultry	0.5	1.2	2.6	1.2	1.1	1.0	0.6	0.9	1.3	1.7	1.2	1.3	1.3
Fish and seafood	2.0	2.8	0.3	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Eggs	-5.4	3.0	3.9	0.7	2.2	2.7	2.7	3.2	3.2	3.1	3.5	3.5	2.8
Dairy products	5.8	0.7	3.9	2.7	2.3	2.3	2.5	2.7	2.1	2.3	2.5	2.0	2.7
Fats and oils	1.0	-0.5	5.8	2.3	2.4	2.5	2.6	2.6	2.4	2.5	2.6	2.4	2.6
Fruits and vegetables	2.5	0.7	3.6	1.7	2.0	2.6	2.6	2.6	2.5	2.5	2.4	2.4	2.4
Sugar and sweets	1.4	1.1	1.2	1.8	2.3	0.9	1.6	2.0	2.3	2.9	1.6	2.6	2.4
Cereals and bakery products	2.2	1.8	2.9	2.1	2.1	2.6	2.3	2.6	3.0	2.7	2.7	2.6	2.6
Nonalcoholic beverages	1.0	2.6	1.1	0.3	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Other foods	2.1	2.0	2.3	2.0	2.3	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5

## **Agricultural Trade**

Growth in the volume of global and U.S. agricultural trade is projected during the next 10 years, aided by ample global supplies and steady demand growth. Long-run demand prospects are improved by widespread economic recovery starting in 2003. The outlook calls for healthy economic growth in most of Asia, Latin America, Africa, the Middle East, and the former Soviet Union, moderate gains in developed countries, and continued progress toward freer trade through ongoing unilateral policy reforms and existing multilateral agreements.

Global and U.S. commodity prices and trade value have been weak in recent years because of large stocks resulting from weakened global demand and large production in the late 1990s. Even with continued output and productivity gains in exporting countries, commodity prices and export earnings are projected to strengthen in the baseline because of steady growth in import demand and reduced U.S. and foreign stocks.

Future trends in China's agricultural trade are key in the global outlook for commodity trade and prices. However, policy other than market forces determines much of China's trade in agricultural commodities and significant uncertainties exist regarding future policies in China. China's agricultural marketing and trade system is assumed to continue a gradual long-term trend of liberalization. The baseline projections assume that China is not a member of WTO during the projections period (see box, "China WTO Accession: Implications for Agricultural Trade"), although trade liberalization is assumed to continue. The baseline includes steady growth in China's imports of most commodities.

The baseline shows improved trade growth for several bulk commodities during 2002-2011, compared with the 1980s and 1990s. Projected growth in wheat and coarse grains trade is particularly strong compared with recent performance, and cotton trade is projected to improve from the contraction of the 1990s. The expansion of grain trade is broad based, driven by rising incomes in developing regions, diet diversification, and increased demand for livestock products and feeds. The phase out of the Multi-Fiber Arrangement (MFA) by 2005 is expected to boost demand for raw cotton in developing countries, while gradually shifting demand in developed countries from raw cotton to processed cotton products (textiles and apparel).

Global trade in soybeans and products is projected to continue growing, but at a slower rate than the rapid growth of the 1990s. Continued strong gains in developing-country demand for feed protein is projected to be partly offset by reduced demand in the EU that results from slowed livestock output and increased substitution of grain for protein feeds following Agenda 2000 reforms. Growth in soybean oil trade is projected to be slower than the very high rate achieved in the 1990s due to increased crushing in developing countries and competition from other oils, particularly palm oil.

U.S. export volume is projected to increase for wheat, coarse grains, and soybeans and soybean products, but decline for rice and raw cotton. For wheat, continued competition holds the U.S. trade share below levels of the late 1990s. For coarse grains and soybean and soybean products, U.S. exports expand more slowly than world trade, due in part to strong competition in these markets. U.S. wheat and coarse grain exports compete with unsubsidized EU wheat and barley

Table 34. International trade summary, by decade or indicated period 1/

Years	Wheat	Rice	Coarse grains	Soybeans	Soybean meal	Soybean oil	Cotton
World trade growth, annual percent <sup>2</sup>							
1960 to 1970 <sup>3</sup>	1.1	2.2	4.9	11.4	14.4	11.3	0.8
1970 to 1980	4.7	4.9	8.7	8.2	11.7	12.8	1.2
1980 to 1990	-0.3	0.6	-1.0	-0.4	2.9	0.5	2.5
1990 to 2000	0.1	7.2	1.1	7.3	4.7	8.3	-0.9
2000 to 2010	2.5	3.0	2.0	3.4	2.3	3.7	1.8
U.S. export growth, annual percent							
1960 to 1970 <sup>3</sup>	-0.8	6.3	3.8	12.6	13.0	5.3	-5.4
1970 to 1980	6.4	6.8	12.7	7.2	5.8	5.4	6.1
1980 to 1990	-3.3	-0.5	-0.7	-3.7	-1.8	-5.5	2.3
1990 to 2000	-1.7	1.9	1.1	4.9	3.1	4.4	-1.2
2000 to 2010	2.4	-0.5	2.0	1.2	1.4	3.7	2.0
U.S. share of world trade, average percent <sup>2</sup>							
1960 to 1970 <sup>3</sup>	37.6	19.0	50.0	90.6	65.6	66.6	18.3
1970 to 1980	43.0	22.1	59.4	82.6	43.5	37.5	19.8
1980 to 1990	37.3	20.2	59.4	72.6	23.7	19.3	21.5
1990 to 2000	29.7	14.0	56.1	62.3	18.4	13.3	25.3
2000 to 2010	25.5	10.3	55.5	44.3	15.6	11.9	32.7

1/ Years refer to the first year of the commodity marketing year.

2/ Trade and trade shares include intra-FSU trade for periods starting in 1990 and later; intra-FSU trade for cotton also is included in the 1980 to 1990 and the 1970 to 1980 periods.

3/ Data for soybeans, soybean meal, and soybean oil begin in 1964.

throughout the projection period. Argentina is expected to remain a strong competitor for coarse grain market share. Eastern Europe also begins to make its presence felt as an exporter in world corn markets early in the projection period.

U.S. raw cotton export volumes remain strong through the baseline, but decline gradually in the second half of the decade due to tighter U.S. exportable supplies and rising foreign production. U.S. rice exports are expected to fall over the baseline period as domestic demand outpaces U.S. production. U.S. exports of soybeans and products grow at a slower pace compared with the 1990s, reflecting projected slower growth in world trade and increasing competition from Argentina and Brazil.

Global meat trade and U.S. meat exports are projected to grow only moderately in the near term as a result of generally slower world economic growth. In Japan, there is expected to be some shift in 2002 away from beef and towards pork and poultry until concerns about the safety of beef subside. All meats benefit from a resumption of world economic growth after 2002. Japan, Mexico, and Russia show large increases in meat imports over the projection period.

Table 35. U.S. agricultural trade values, baseline projections, fiscal years (October 1 - September 30)

	1999	2000	2001	2002 1/	2003	2004	2005	2006	2007	2008	2009	2010	2011	2001-2011 growth rate
	<i>Billion dollars</i>													<i>Percent</i>
<b>Agricultural exports:</b>														
Animals and products	10.1	11.8	12.6	12.4	12.9	13.6	14.2	14.8	15.4	16.0	16.6	17.3	17.8	3.6
Grains, feeds, and products	14.4	13.9	13.9	15.5	14.9	15.5	16.3	17.1	17.6	18.8	19.8	20.8	21.4	4.4
Oilseeds and products	8.7	8.5	8.8	8.8	9.2	9.8	10.4	11.1	11.8	12.5	12.9	13.4	13.7	4.5
Horticultural products	10.3	10.5	11.1	11.3	11.6	12.0	12.4	12.8	13.2	13.6	14.0	14.4	14.8	3.0
Tobacco, unmanufactured	1.4	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.2	1.2	1.2	1.2	0.0
Cotton and linters	1.3	1.8	2.1	2.1	2.9	3.3	3.2	3.3	3.4	3.5	3.5	3.5	3.5	5.3
Other exports	2.9	3.1	3.3	3.2	3.4	3.5	3.6	3.7	3.8	3.9	4.1	4.2	4.3	2.6
<b>Total agricultural exports</b>	<b>49.2</b>	<b>50.9</b>	<b>53.0</b>	<b>54.5</b>	<b>56.1</b>	<b>58.9</b>	<b>61.3</b>	<b>64.0</b>	<b>66.4</b>	<b>69.5</b>	<b>72.1</b>	<b>74.8</b>	<b>76.7</b>	<b>3.8</b>
Bulk commodities exports	17.8	17.8	17.6	19.0	18.9	20.1	21.0	22.0	22.9	24.5	25.6	26.7	27.3	4.5
High-value product exports	31.4	33.1	35.3	35.5	37.2	38.8	40.4	42.0	43.5	45.0	46.5	48.0	49.4	3.4
High-value product share	63.8%	65.1%	66.7%	65.1%	66.4%	65.9%	65.8%	65.6%	65.5%	64.8%	64.5%	64.2%	64.4%	
<b>Agricultural imports:</b>														
Animals and products	7.0	8.1	9.0	9.0	9.3	9.7	10.0	10.0	10.0	10.1	10.3	10.4	10.4	1.5
Grains, feeds, and products	2.9	3.1	3.2	3.2	3.3	3.5	3.6	3.7	3.8	3.9	4.0	4.2	4.3	3.0
Oilseeds and products	1.9	1.9	1.7	1.9	2.1	2.2	2.4	2.5	2.7	2.8	2.9	3.1	3.1	6.4
Horticultural products	15.3	15.8	16.4	16.7	17.2	17.8	18.5	19.2	19.9	20.6	21.4	22.2	23.0	3.4
Tobacco, unmanufactured	0.7	0.7	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0	1.0	1.1	1.1	5.4
Sugar and related products	1.6	1.5	1.6	1.6	2.2	2.1	2.0	2.1	2.1	2.3	2.7	2.7	2.9	5.8
Coffee, cocoa, and rubber	5.2	5.2	3.8	3.5	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	1.2
Other imports	2.6	2.6	2.6	2.5	2.7	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	2.7
<b>Total agricultural imports</b>	<b>37.3</b>	<b>38.9</b>	<b>39.0</b>	<b>39.0</b>	<b>41.1</b>	<b>42.4</b>	<b>43.8</b>	<b>45.0</b>	<b>46.3</b>	<b>47.9</b>	<b>49.6</b>	<b>51.0</b>	<b>52.5</b>	<b>3.0</b>
<b>Net agricultural trade balance</b>	<b>11.9</b>	<b>12.0</b>	<b>13.9</b>	<b>15.5</b>	<b>15.0</b>	<b>16.5</b>	<b>17.5</b>	<b>18.9</b>	<b>20.1</b>	<b>21.6</b>	<b>22.5</b>	<b>23.8</b>	<b>24.2</b>	<b>5.7</b>
	<i>Million metric tons</i>													
<b>Agricultural exports (volume):</b>														
Bulk commodity exports	113.8	115.4	112.0	119.0	115.4	117.9	120.8	123.5	125.9	129.5	133.6	135.9	138.2	2.1

1/ The projections were completed in November 2001 based on policy decisions and other information known at that time. For updates of the nearby year forecasts, see USDA's *Outlook for U.S. Agricultural Trade* report, published in February, May, August, and December.

Note: Other exports consists of seeds, sugar and tropical products, and beverages and preparations. Essential oils are included in horticultural products. Bulk commodities include wheat, rice, feed grains, soybeans, cotton, and tobacco. The high-value products (HVP's) export value is calculated as total exports less the bulk commodities. HVP's include semi-processed and processed grains and oilseeds, animals and products, horticultural products, and sugar and tropical products. Other imports includes seeds, beverages except beer and wine, and miscellaneous commodities.

## U.S. Agricultural Trade Value

Total U.S. agricultural export value is projected up an average of 3.8 percent annually between 2001 and 2011, reaching \$76.7 billion in 2011, compared with \$53 billion in 2001. U.S. agricultural imports in 2011 are projected at \$52.5 billion after an average gain of 3 percent per year from the \$39 billion of 2001. The resulting agricultural trade surplus of \$24.2 billion in fiscal 2011, although up annually 5.7 percent on average from 2001, is still below the fiscal 1996 record export surplus.

Fiscal year 2001 U.S. agricultural exports equaled \$53 billion, a 4-percent gain from the \$50.9 billion export value in fiscal 2000. Gains in the value of high-value product (HVP) exports offset a slight decline in the value of bulk exports. Continued low bulk commodity prices and reduced bulk export volumes reflected large world supplies, a strong U.S. dollar which reduced U.S. export competitiveness, and a general weakening of global economic growth during the year. Total export value in fiscal 2002 is projected to increase to \$54.5 billion, a smaller annual gain than in 2001, reflecting large global supplies, slowing demand due to the world economic slowdown, and the continued strong U.S. dollar. Bulk commodity exports show greater gains in both value and volume than HVP exports, with the HVP share of total agricultural exports dropping back to 65 percent.

In the decade from 2001 to 2011, both bulk and HVP exports are expected to show growth, while their shares in total U.S. exports remain about stable. HVP exports account for 64 to 66.5 percent of total agricultural exports through the projections. HVP agricultural export value is projected up 3.4 percent per year on average, continuing a long-term upward trend. The largest

gains projected for HVP exports are for dairy, beef, and animal feeds. Bulk product values rise 4.5 percent annually, thereby lending strength to total export earnings, in contrast to the very small growth of bulk exports in the 1980s and declines in the 1990s. Bulk product growth--primarily corn, soybeans, and wheat--reflects both a recovery of bulk prices and a 2-percent annual average growth in bulk volume. The major categories containing bulk commodities--grains and feeds, oilseeds and products, and cotton and linters--show stronger annual growth rates in the coming decade than in the previous decade.

U.S. agricultural imports are expected to increase an average 3 percent per year in 2001-2011, compared with an average 5.1 percent from 1990 to 2001. Slower commodity price inflation in the coming decade is largely behind this moderate import growth forecast. Imports that are projected to grow more than 3 percent include oilseeds and products, horticultural products, sugar and related products, and tobacco. Among imports forecast to grow less than 3 percent are animals and products, coffee, cocoa, and rubber.

### **Foreign Agricultural Policy Assumptions and Projection Highlights**

Policy assumptions underlying both U.S. and foreign projections are based on full compliance with all bilateral and multilateral agreements affecting agriculture and agricultural trade as of October 2001, including the Uruguay Round Agreement on Agriculture and the North American Free Trade Agreement. In contrast, no compliance is assumed for any agreements not formally ratified by October 2001. Several potential multilateral agreements that could have significant impacts on agricultural trade during the projection period are not reflected in the baseline. These potential agreements include:

- Accession to the World Trade Organization (WTO) by China, Taiwan, or any other country not formally admitted as of October 2001;
- Enlargement of the EU-15 to add one or more Central or East European countries;
- Implementation of more liberalized trade among the Asia-Pacific Economic Cooperation (APEC) countries;
- Expansion of NAFTA to include additional countries; and
- Implementation of any reforms under consideration in the current round of WTO negotiations.

Domestic agricultural and trade policies in individual foreign countries are assumed to continue to evolve along their current path, based on the consensus judgment of USDA's regional and commodity analysts. In particular, economic and trade reform underway in many developing countries is assumed to continue. Similarly, the development and use of agricultural technology and changes in consumer preferences are assumed to continue to evolve based on past performance and analyst judgment regarding future developments. Key assumptions underlying the projections for major foreign countries are summarized below.

## **European Union**

The EU is one of the world's largest and wealthiest trading blocks. Because of its diverse cultures, economies, and agro-climatic settings, the EU is both an importer and exporter of most major bulk commodities. The EU is the world's leading exporter of barley and pork, and ranks among the top exporters of wheat, beef, poultry, rye, and oats. At the same time, the EU has been the world's leading importer of soybeans and soybean meal for the past several decades, with a global import share (in soybean equivalents) in excess of 40 percent. The EU also is a significant importer of cotton, corn, rice, and meat products. As a result, projected trade for the EU does much to shape the global outlook, so assumptions underlying the EU projections are crucial. Key assumptions and their expected effects are discussed below.

**WTO/Uruguay Round Agreement Commitments.** The EU adheres to commitments made under the Uruguay Round Agreement that limit both domestic support and subsidized exports, and that improve access to the EU market. The baseline projections assume that the EU's Uruguay Round commitment to reduce domestic support is not a binding constraint, since many EU domestic support policies meet WTO "production limiting" criteria and are thereby exempt from reduction commitments. In addition, continued high levels of import protection mean that price transmission from the world market will be negligible for many baseline commodities except wheat, barley, and oilseeds and products. The most important Uruguay Round commitments for the baseline are the limits on subsidized exports and the minimum import levels agreed to under the market access provisions. Although binding for beef, the export subsidy constraints are not binding for most grain exports due to reforms enacted under Agenda 2000 and strengthening international market prices.

**EU Enlargement.** Impacts of the anticipated accession of the Central and Eastern European (CEE) countries to the EU are not included in the projections. Accession of the large agricultural-producing CEE countries could cause serious problems for the CAP in its current form, providing an impetus for policies to further reduce levels of price and budget support below those implied by the current projections. Despite these likely implications for agriculture, enlargement is not incorporated into the baseline because of the high degree of uncertainty regarding the final terms and timing of enlargement. Pre-accession negotiations have yet to be completed and it is still undecided whether agricultural policies will be phased in or adopted immediately. In addition, most potential new members are well behind in meeting their scheduled commitments for internal reform prior to joining the EU, thereby increasing the likelihood of delays.

**Exchange Rate.** The euro is assumed to strengthen slightly against the dollar in 2002 through 2004, and then to weaken somewhat through the remainder of the projections.

**Agenda 2000.** Adopted in early 1999, the Agenda 2000 financial and agricultural policy reforms affect the grains, oilseeds, dairy, and beef sectors for the period 2000-2006. Many of the principal reforms affecting the baseline have already been implemented, while others are scheduled to begin during the baseline period. Key features and their consequences include:

- **Shift intervention from price supports to direct payments:** The cereal intervention price is reduced by 15 percent over 2 years (2000-2001), the beef support price by 20 percent over 3 years (2000-2002), and dairy support prices by 15 percent to be phased in over 3 years starting in 2005. To compensate for half of the drop in the intervention price, direct payments to cereal producers are increased by 9 euros/ton. Direct payments for oilseeds are aligned to cereal aid in 3 annual steps by 2002 (for a total drop of 33 percent). Per-animal beef payments are increased, and a new payment per quantity of milk produced is to be started in 2005.

Growing wheat is more profitable than growing oilseeds under a situation of equal compensatory payments, thus some acreage shifts out of oilseeds and into wheat. Due to the declines in intervention prices and the weak euro, projected domestic and world prices indicate that EU wheat and barley can be exported without subsidy throughout the baseline period. Exports of other coarse grains—predominantly rye and oats—continue to require subsidies for exports. However, they are less constrained by the Uruguay Round subsidized export limits because barley exports—which also fall under the WTO limits for coarse grains—are unsubsidized, thereby freeing greater subsidies for use on the other coarse grains. (Note, the WTO-mandated limit on coarse grain’s export subsidies is applied to the aggregate, and not individual coarse grains.)

- **Reduced land set-aside rate:** A mandatory land set-aside is required for eligibility for compensatory payments. The default rate was initially set at 10 percent. However, with no budgetary pressure (from costly export subsidies) to force the political consensus necessary to restrain area expansion, it is assumed the EU Commission will respond to pressure from EU grain farmers to lower the set-aside rate. As a result, the set-aside rate is assumed in the baseline to be reduced to 7.5 percent in 2003, then to 5 percent in 2005.

Set-aside reductions are expected to allow production and exports of wheat and barley to increase as area expands. The world price remains above the EU intervention price in spite of the increase in EU exports, hence WTO limits on subsidized exports do not constrain EU wheat and barley exports. Unsubsidized wheat exports exceed the WTO volume limit on subsidized exports by 2003 and continue to increase annually throughout the period, reaching 28 million metric tons in 2011.

Unsubsidized barley exports allow EU coarse grain exports to move slightly above the WTO volume constraint on export subsidies in 2005 and remain slightly above or very near the WTO constraint until 2011. Barley exports account for about 85 to 90 percent of EU coarse grain exports. Most of the barley exports in the past have gone to countries of the Middle East with high population growth and petroleum-generated income. Although world barley demand grows about 2 percent per year, increased competition from CEE and FSU regions limits the EU’s ability to push its barley surplus into world markets. EU exports of other coarse grains, notably rye and oats, are limited by strong competition from Canada and by low global import demand growth.

- **Maintaining the Milk Quota:** Dairy quotas are retained for the duration of Agenda 2000 and increased by 2.4 percent. Half of the quota increase is allocated to “deficit” regions from 2000-2001, and the other 1.2-percent increase will be spread over the remaining regions from 2005 to 2008.



Beef reforms (i.e., lower intervention price and higher headage payment) were designed to reduce excessive beef stocks. However, due to the lower feed cost from cheaper grain, and increases in the dairy quota and direct payments, beef production will decline only slightly since nearly 80 percent of EU beef is a byproduct of the dairy herd. Because the EU intervention price for beef (even with the 20-percent cut) remains so far above world market prices, all beef exports must still be subsidized. As a result, beef exports reach the WTO limit of 817,000 tons by 2005 and remain there through 2011. Subsidized exports of pork and poultry are dictated by WTO commitments, while unsubsidized exports are projected to increase slightly.

Baseline projections reflect EU consumer response to food safety concerns associated with the recent outbreaks of bovine spongiform encephalopathy (BSE) and food and mouth disease (FMD). In addition, projections include estimates of shifts in protein meal consumption stemming from the EU's recent ban on use of meat and bone meal as a feed additive. The ban is assumed through the baseline (see box, "EU Agricultural Sector Impacts of BSE and FMD" for more details). Several emergency beef market measures that go beyond Agenda 2000 reforms were passed in July of 2001 but are not included in these projections. Such measures include reductions in stocking density, new headage limits, reductions in national ceilings for special premia, new suckler cow premium limits, and possible suspension of reallocating premium rights.

Even with the Agenda 2000 reforms, there is uncertainty about the measures the EU will use to meet the WTO commitments. Any commodity supplies in excess of intervention purchases and on-farm use that cannot be exported are assumed to build stocks and depress internal market prices to clear domestic markets. However, it is assumed that the EU will use existing policy mechanisms to comply with WTO commitments without excessive stock accumulation.

Despite the anticipated ability to export wheat and barley without subsidies throughout the projection period, increased production, abundant grain stocks, and falling internal grain prices—via Agenda 2000 reforms—combine to reduce the relative cost of feeding grains versus soybean meal. As a result, increases in grain feeding, partly from stocks, are expected to cut EU soybean meal consumption. Consequently, EU imports of soybeans and soybean meal are expected to stagnate early in the projection period before declining slightly in the latter years. The EU's combined global import share of soybeans and soybean meal (in soybean equivalents) declines from about 41 percent in 2001 to under 30 percent by 2011.

Imports of coarse grains reflect the EU's market access commitments for corn, while imports of other coarse grains are minimal. Under the projected scenario for world wheat prices and the low EU intervention price for grains it is expected that some high-quality wheat imports by the EU will occur. The maximum duty paid price for grains is 152 percent of the intervention price. Under Agenda 2000 reform the intervention price has fallen to 101.31 euro per ton in 2001. Thus, the maximum duty paid price would be 154 euro. At the assumed exchange rate of 1.13 euro/dollar in 2002, this is about \$136 a ton, well above projections for high-quality wheat (e.g., Hard Red Winter, Gulf Ports). As a result, some high-quality wheat (possibly Canadian, as the strong dollar makes U.S. wheat relatively expensive) is expected to enter the EU.

### **EU Agricultural Sector Impacts of BSE and FMD**

The discovery of both Bovine Spongiform Encephalopathy (BSE) and Foot and Mouth Disease (FMD) in several member countries in 2000 and 2001 seriously affected the livestock industry in the European Union (EU), especially in the U.K. The most recent BSE crisis started in October of 2000 and was the third such crisis to hit the EU over the last 12 years (other BSE crises occurred in 1988 and 1996). In February of 2001, a large outbreak of FMD originated in the U.K.

BSE, also called mad cow disease, is a neurological disease in cattle first discovered in Britain in 1986. Although initially an animal health concern affecting cattle supplies, it became a human health/food safety issue in 1996 when the British government announced a possible link between BSE and a new human variant of Creutzfeldt-Jacob Disease (vCJD). Both BSE and its human form, vCJD, are always fatal. The human version of BSE is thought to be contracted by consuming beef or other products from infected cattle. Because vCJD appears to have a long incubation period spanning several years, it is not known whether its incidence has peaked in humans.

In response to the BSE crisis, the European Commission (EC) imposed a series of measures to ensure the safety of the beef supply in the EU, including the destruction of all cattle over thirty months of age not tested for BSE. An estimated 1 million cattle (only slightly more than 1 percent of EU herds) were slaughtered due to this criteria. As a result, estimated beef production declined by more than 500,000 tons between 2000 and 2001, but is expected to recover slightly later in the period. The EU also imposed a ban on feeding of meat and bone meal to all livestock, which will likely be replaced in animal feeds by an additional 1.5 million tons of soymeal.

While there was a sharp decrease in beef consumption in 2000 and 2001 in some EU member states as a result of the BSE and later FMD crisis, consumption has been recovering and will likely recover even more in subsequent years, approaching its long-term declining trend (fig. 4). Such a pattern of rebounding consumption was observed after previous BSE incidents in the EU.

FMD is a highly contagious, viral disease primarily affecting cloven-hoofed animals such as cattle, hogs, and sheep. FMD can significantly reduce meat and milk production. Unlike BSE, FMD is not usually fatal to livestock and it is not considered a food safety issue. However, FMD does affect food supplies and trade status. Infected or exposed livestock are quarantined, depopulated, and not allowed for consumption, reducing total supplies of livestock products.

About 4 million animals have been slaughtered in the U.K. as a result of the FMD outbreak and about 80 percent of the slaughtered animals have been sheep. These represent a small portion of the total livestock herd in the EU, so it is anticipated that total EU livestock production will not be significantly impacted. However, temporary bans on EU meat exports caused a sharp decline

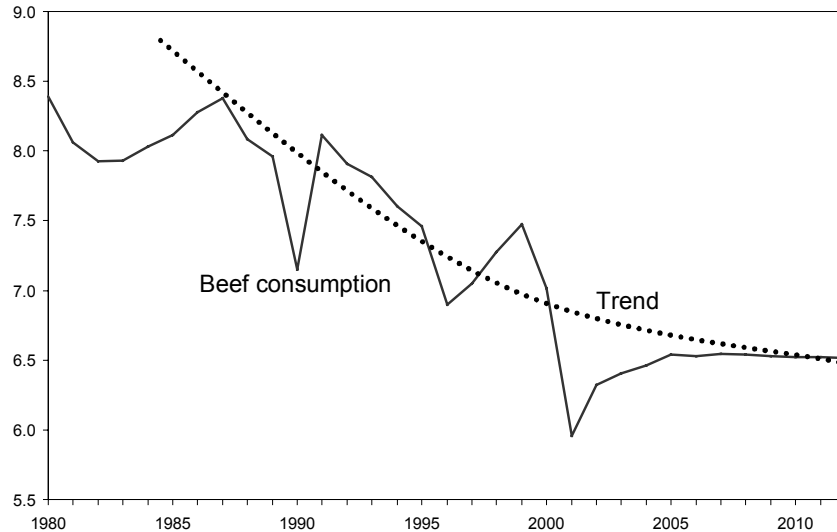
**--continued**

## EU Agricultural Sector Impacts of BSE and FMD--continued

Figure 4

**EU beef consumption is on a downward trend, punctuated by lagged declines related to the three BSE crises of 1988, 1996, and 2000\***

Million metric tons



\* USDA PSD database, 1980-2001; baseline projections, 2002-2011.

in EU exports of both beef and pork in 2001. Exports are expected to return to their long-term trend during the projection period. However, future exports are contingent upon the ability of the EU to prevent further FMD outbreaks and the relaxing of import restrictions and safeguard measures from major EU meat importers such as Russia, Egypt, and Japan.

## Asia and Oceania

**Australia.** Production for export dominates Australian agriculture. Australia ranks among the world's leading exporters of wheat, barley, rice, rapeseed, cotton, sugar, and wool. Australian producers are expected to continue to adjust cropping patterns, and to switch between crop and livestock enterprises, to maximize returns. With rising global populations and world GDP growth forecast to recover starting in 2003, Australia's production and exports of most major commodities are projected to continue to expand. Key issues in the outlook for production are the response of producers to uncertainties regarding price variability and the availability of water. Until more irrigated area is available, area expansion will be slow for some crops.

Cotton is expected to continue providing higher returns than competing field crops. Production and export growth are projected to show moderate gains, but remain heavily dependent on the availability of irrigation water. Australia's cotton exports are projected to grow over 3 percent per annum reaching 4.2 million bales in 2011. Stagnant wheat area and only modest yield gains are projected to produce modest growth in production. However, increased domestic feeding of

wheat is expected to slow growth of wheat exports to about 1 percent through 2011. Growth in Australia's rice exports will be very limited due to water-related constraints on increasing both yield and irrigated area. Barley output is expected to show only incremental growth as declining area partially offsets slight yield gains. However, the share of barley area and exports devoted to malting barley continues to rise, and malt barley gains an increasing share of Australia's barley exports. Low prices and more favorable returns for other enterprises result in projected flat growth of the cattle herd, and subsequently for beef production. Growth in domestic beef consumption is expected to result in slight declines in beef exports through 2011.

**China.** Because of its enormous size, both in terms of supply (China is among the world's leading producers of rice, wheat, corn, soybeans, hogs, beef, poultry, and cotton) and demand (imports are often needed to satisfy growing demand from an increasingly urbanized population of 1.2 billion), China is often a major influence in international commodity markets. China's long-term food supply and demand prospects are for rising agricultural production, and also sustained growth in income-driven demand for meats and edible oils and derived demand for feed grains. China's future per capita consumption of staple food grains is projected to decline due to low urban demand for wheat and rice together with increasing urbanization. Meanwhile, China's per-capita consumption of pork, poultry, and high-valued fruits and vegetables has not caught up with its wealthier neighbors and is expected to continue rising as incomes and the urban population grow. Despite important market reforms over the past decade, government policy remains a key determinant of China's agricultural production and trade levels.

**Policy and economic reforms to continue:** China's agricultural marketing and trade system is assumed to continue a gradual long-term trend of liberalization. The baseline projections assume that China is not a member of the WTO during the projections period (see box, "China WTO Accession: Implications for Agricultural Trade"), although trade liberalization is assumed to continue.

Government agricultural policy has tried to maintain stable domestic food prices while striving for rising rural incomes. In the past, China's agricultural policy has been centered on the food grain sector and on maintaining domestic self-sufficiency for most commodities, generally restricting imports to less than 5 percent of consumption. The principal mechanism that the government used to promote cereal production was fixed quota purchases. Reliance on state-managed agricultural trade via state trading companies and unannounced import (and export) quotas for wheat, rice, corn, and cotton have been the primary factors governing China's major bulk agricultural commodity trade. To a lesser extent, trade in other agricultural commodities, such as soybeans and soybean products, has also been influenced by government policy, but through licenses, export taxes, value-added taxes, tariffs, and other mechanisms rather than through quotas or state trading.

In the baseline period, the domestic marketing system remains dominated by government administrative and financial support. However, it is slowly liberalizing as the government attempts to reduce swelling financial outlays supporting the inefficient government-owned agricultural marketing and distribution system. In the last two years, several provinces have announced that they will no longer enforce grain quota deliveries (particularly for low-quality wheat and rice), a significant step in the reform of grain policy. The share of domestic grain

trade handled by private, quasi-private, or even joint public-private trade companies is expected to expand significantly.

Reduced government purchases and elimination of low-quality purchases represent immediate cutbacks in demand, diminish planting incentives, and ultimately reduce supply. In the near term, large stocks are believed to be sufficient to forestall the need to significantly increase grain imports. In the longer run, reduced grain supply implies higher domestic free market prices, greater incentive to produce higher quality grains, and larger imports.

**Strong economic growth:** An important key to the development of China's international trade projections is strong growth in domestic demand triggered by expected solid economic growth throughout the period. China's economic growth has consistently been the strongest in Asia for some time, and this will not change in the forecast period, but the rate will average 7.8 percent over the next decade compared with the double-digit rate of the early and mid 1990s. With projected population growth averaging 0.6 percent per year, per capita GDP gains will average about 7 percent annually. These gains will begin to penetrate China's poor inner provinces as transportation infrastructure and labor markets improve. General economic growth is also expected to facilitate the development of more modern food processing facilities as wealthy urban consumers increase the demand for processed foods.

**Continued investment in agriculture:** China will continue to increase state investment into agriculture. More government investment in agricultural research and development and in agriculture infrastructure, such as irrigation and flood control, will be a driving force in reducing costs and increasing returns to farmers. Findings that show investment in agricultural research and infrastructure to be the most important determinant of productivity increases over the last two decades have motivated leaders to increase these investments in order to maintain food self-sufficiency. These investments will improve productivity and facilitate the transition to more capital-intensive farming as labor moves out of agriculture.

Domestic crop production is projected to increase, primarily via yield growth boosted by greater use of improved varieties and complementary inputs. Potential water constraints for northern-tier crops, particularly wheat, are a major long-run uncertainty. The quality of grain output will increase to match the quality demanded by millers. This change is already underway as recent policy initiatives have reduced incentives to produce low-quality grain. Although grain and cotton area are expected to decline in the short term, over the longer term area and yield gains and production growth are expected to be modest but steady.

**Trade outlook is for most commodity imports to increase in volume, but only modestly as a share of domestic consumption:** The net result of recent agricultural and trade policy changes, combined with strong growth in domestic demand and only moderate yield gains, is a projection of robust growth in imports of key agricultural commodities. Imports of wheat and soybeans are expected to grow rapidly through the projection period, while imports of corn, barley, soy oil, soy meal, palm oil, and cotton grow slowly in the early years with increased strength in the later years. China's agricultural commodity imports are not expected to tax the supply capacity of world markets.

### **China WTO Accession: Implications for Agricultural Trade**

On December 11, 2001, China was formally admitted into the WTO. However, because China's WTO commitments had not been finalized when the baseline analysis was conducted (July-October of 2001), the baseline projections do not include China as a formal WTO member. Most details concerning the implementation of China's WTO commitments were unknown, since China was still engaged in multilateral negotiations to finalize its WTO commitments. Even after entry, specifics are lacking and implementation rules remain vague. How the regulations are implemented, particularly with regard to the allocation of import quotas to nonstate trading entities, will have important implications for China's agricultural trade.

There is little doubt that China's WTO accession will have significant impacts on global agricultural trade. Here, a qualitative discussion of potential agricultural trade impacts of China's WTO accession is provided. The analysis is based on China's WTO commitments to establish fixed tariff-rate quotas for major commodities, extend trading rights to private and other nonstate entities, and eliminate export subsidies. The WTO commitments differ in some details and cover a wider variety of commodities, but are in general similar to those in the U.S.-China accord of November 1999. (A further discussion of impacts of China's WTO accession is provided in a paper presented at the February 2002 USDA Outlook Forum.)

#### **Overview of Terms of Accession**

**Tariff Bindings.** China commits to elimination of all non-tariff barriers, leaving tariffs as the only measure affecting imports. Other measures, such as inspection, testing, and domestic taxes will comply with WTO rules. All tariffs are bound at current levels, with reduced tariffs for many products. There will be annual tariff reductions starting in 2002 and continuing, for most commodities, through 2004, when the average agricultural tariff will fall to 17 percent.

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As in the past, nearly all of China's future food needs will be met through domestic production. However, the import share of domestic consumption is expected to grow slightly for most commodities. For example, for grains the import share of total consumption rises from a projected 2.6 percent in 2002/03 to 4.6 percent in 2011/12. Import shares for cotton and oilseeds grow at a faster rate, while meat import shares of domestic consumption decline.

China's domestic wheat production is expected to undergo significant adjustment towards higher quality (but often lower yielding) varieties. Despite these internal adjustments, strong demand for high-quality milling wheat is expected to push wheat imports from 2.6 million tons in 2002/03 to 9.1 million tons in 2011/12. China is expected to remain an important net exporter of 3 to 4 million tons of rice through the baseline period in response to rising international demand, particularly for lower-cost supplies. Large exports of short-grain japonica and low-quality long-grain indica rice easily exceed its growing imports of high-quality long-grain indica rice.

### **China WTO Accession: Implications for Agricultural Trade--continued**

**Tariff Rate Quota Administration.** Tariff-rate quotas (TRQs) are established for major bulk commodities, including wheat, corn, rice, cotton, vegetable oils (soybean, palm and rapeseed), sugar, and wool. For each of these goods, a specified quantity of imports will enter at a low tariff ranging from 1 to 10 percent (initially 20 percent for sugar), with additional imports assessed a higher duty. The TRQ quantities have been set for 2002, 2003, and 2004 (and 2005 for vegetable oils). The TRQ amounts increase annually. Vegetable oil TRQs are scheduled to end after 2005. For other commodities, new TRQs will be negotiated at the end of this implementation period. In the absence of a new agreement, the 2004 TRQ amounts will remain in place. China will not be required to purchase the entire TRQ for a commodity, but the TRQ regime will require that imports be based on market conditions rather than policy or economic planning considerations. A share of each TRQ will be available for import by non-state trading enterprises.

**Trading Rights.** For several major commodities, the right to import will, for the first time, be extended to any end-user. Previously, government state trading enterprises (STEs) controlled all trade in wheat, corn, rice, cotton, and soybean oil, but China has committed to set aside minimum shares of import quotas for non-STEs. For 2002, the non-STE shares range from 67 percent for cotton to 10 percent for wheat and long-grain rice. Trade in wheat, corn, and rice, will continue to be channeled primarily through STEs, but they will no longer have a full monopoly.

**Export Subsidies.** China commits not to use export subsidies for farm products.

**Domestic Support.** China commits to cap potentially trade-distorting domestic subsidies at 8.5 percent of the value of agricultural production.

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In September of 1999, China ended the long-standing state-monopolized cotton purchase and sale system. In addition, China's cotton crop has been grown with no official cotton procurement price since 1999, instead letting market conditions determine prices. The government also auctioned more than 10 million bales of cotton from government stocks to the domestic textile industry, resulting in lower domestic cotton prices, increased competitiveness of textile exports, and lower cotton imports. Lower prices also increased domestic consumption, as lower costs helped cotton to compete with synthetic fiber. As a result, the domestic textile sector has worked through significant stocks in recent years. China's net cotton imports are expected to start growing early in the baseline period. China's huge comparative advantage in low-cost labor is expected to allow the country to capture a growing share of world trade in textiles and apparel. As a result, China's cotton imports are projected to rise strongly after 2004 when the MFA is phased out. Cotton imports are projected at 4.6 million bales by 2011, while China's cotton exports decline to only 0.3 million bales.

## **China WTO Accession: Implications for Agricultural Trade--continued**

### **Implications for Agricultural Trade**

The agreed TRQ levels for wheat, rice, corn, cotton, and soybean oil are significantly higher than the baseline projections. The gap between current projections and the TRQ amounts may be viewed as an upper bound on the potential increase in China's imports. High over-quota tariffs of 40-80 percent make imports above the TRQ level unlikely, but China can unilaterally lower over-quota tariffs if additional imports are needed.

**Wheat.** The TRQ amount is 8.5 million tons in 2002, rising to 9.6 million tons in 2004. However, several factors suggest actual trade gains will be below the TRQ amount. Key factors are high current Chinese wheat stocks that are likely to depress domestic prices and dampen import demand, continued regional price support programs for wheat producers, and slowing growth in domestic wheat use.

**Rice.** The TRQ amount is 4 million tons in 2002, rising to 5.3 million tons in 2004, with the quota split evenly between short- and long-grain rice. However, the potential for short-grain rice imports is very limited because of large stocks. There is more scope for imports of long-grain rice, but high stocks and government incentives for producers should constrain imports to well below the TRQ level.

**Corn.** The TRQ amount is 5.85 million tons in 2002, rising to 7.2 million in 2004. In the near term, imports may not reach the TRQ level because high stocks are likely to reduce import demand. Also, farmers in Northeast China, the most important corn-producing region, are unlikely to reduce production significantly in the foreseeable future.

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China's projected barley imports grow steadily from about 2.6 million tons in 2002/03 to 3.3 million in 2011/12, reflecting demand growth for beer and other alcoholic beverages.

Significant growth is projected for China's domestic livestock sectors, as rising population and income result in higher meat demand. Expansion in domestic meat production and increased use of commercial feeds are expected to result in rising domestic corn consumption to feed the growing livestock numbers. Part of this growth in corn consumption will be met by imports. In 2002/03, China is still projected as a major corn net exporter (of 3.8 million tons) to East and Southeast Asia destinations. However, China is projected to shift from being a net corn exporter to a net importer roughly midway through the projection period. China's corn exports decline steadily through the period to about 1 million tons, compared with corn imports which grow to 7.8 million tons in 2011.

Perhaps the most significant impact on global markets is the projection for growth in China's import demand for soybeans and soybean products, and the role of government policy in influencing soy complex trade patterns. Strengthening internal demand for protein meal by livestock feeders and vegetable oil by a rapidly growing urban population underlie large



### **China WTO Accession: Implications for Agricultural Trade--continued**

**Vegetable oils.** The TRQ commitment for soybean oil is 2.5 million tons in the year 2002, rising to 3.6 million in 2005. For palm oil the TRQ rises from 2.4 million tons in 2002 to 3.2 million tons in 2005, and for rapeseed oil the TRQ rises from 878,900 tons in 2002 to 1.2 million tons in 2005. TRQs for vegetable oils will be eliminated after 2005 and converted to bound tariffs. There is significant potential for greater soybean oil imports under the new trading rules and tariffs because of strong domestic demand and high internal prices relative to world prices.

Beginning January 1, 2006, trade in vegetable oils will be conducted with a bound tariff, with trading rights granted to all individuals and enterprises.

**Soybeans and meal.** No TRQ is established for soybeans or soybean meal. Both goods can be imported freely under relatively low tariffs, but soybean imports are subject to China's domestic value-added tax.

**Cotton.** The TRQ amount is 818,500 tons (3.8 million bales) in the year 2002, rising to 894,000 tons (4.1 million bales) in 2004. Imports may remain below the quota due to several factors, including a shrinking gap between domestic and world prices and the potential release of large domestic stocks into the market. In the longer term, once stocks have adjusted, imports may be driven upward by a growing gap between consumption and production.

**Wool.** The TRQ amount rises from 264,500 tons in 2002 to 287,000 tons in 2004.

**Sugar.** The TRQ amount rises from 1.764 million tons in 2002 to 1.945 million tons in 2004.

**Meats.** No TRQs are established, but China commits to significant cuts in many of its highest meat tariffs. Tariff reductions are likely to increase meat imports from current low levels. The agreement also lifts current bans on imports, assures acceptance of products certified by USDA's Food Safety and Inspection Service, and liberalizes distribution services for farm products, including meats. It is difficult to assess the impact of these regulatory changes, but they are likely to boost imports for urban consumption over the longer term.

projected increases in use and trade of soybeans and soybean products. China's non-WTO tariff structure favors imports of soybeans over soybean meal and soybean oil, reflecting a policy change made in 1999. China's government adopted a policy to maximize domestic oilseed crushing capacity instead of importing protein meal and vegetable oil. The government implemented border measures to support this policy and invested heavily in crushing facilities. As a result, China's soy complex trade has seen a dramatic swing from large state-sanctioned imports of soybean meal and soybean oil to importing enormous quantities of soybeans. Soybean imports jumped from only 3.9 million tons in 1998/99 to a record 10.1 million tons in 1999/2000.

A continuation of these forces is expected to result in large increases in China's soybean imports in the baseline, growing nearly 8 percent per year from 15.7 million tons in 2002/03 to about 31 million tons in 2011/12. Even with such rapid growth in soybean imports and domestic crushing, increased imports of both soybean meal and soybean oil are also projected to meet the growth in demand, particularly in the latter half of the projection period.

Government policy favors domestic meat production over meat imports, accomplished through high meat import tariffs and a restrictive import-licensing regime. As a result, China is not projected to be a significant importer of beef and pork over the next decade despite strong income growth and subsequent meat demand growth. However, China's poultry imports are projected to grow steadily through 2011.

**East Asia.** This region's trade outlook is dominated by a major shift from importing feedstuffs to importing meat and other livestock products. Although consumption of livestock products grows modestly at about 1 percent per year through 2011, meat imports grow at a much faster 2-percent annual rate as they satisfy all new demand for meat, as well as gradually replace declining domestic production.

Agricultural trade in this region remains heavily dependent on feed-livestock interactions and each country's willingness (or lack thereof) to look to international markets to help meet demand. International trade commitments dictated by the Uruguay Round agreement play a major role in determining agricultural trade levels in Japan, South Korea, and Taiwan. Without these trade commitments, agricultural imports would be significantly smaller as all three countries retain trade barriers that are highly protective of their domestic agricultural sectors.

International trade commitments have lowered the barriers to meat imports. Japan's reductions in import barriers under the Uruguay Round ended in 2000, and no further changes are projected through 2011. However, if a new multilateral agreement on agriculture emerges, the barriers—the gate price system for pork (which acts as a variable levy on imports) and high tariffs on beef—are likely to fall further. Minor reductions in South Korea's import tariffs continue to take effect through 2004, but a major milestone was reached at the beginning of 2001, when the last of the meat quotas (on beef) was eliminated. Subsequent trade litigation before the WTO obliged South Korea to level the playing field for retail sales of imported beef, and much freer marketing of imported beef in the projection period from 2002 on should raise import volumes. Taiwan was voted into the WTO in November 2001, after the projections were made, and its WTO commitments are thus not reflected in the projections. However, Taiwan had already reduced barriers on some livestock product trade in advance of its WTO entry.

Japan, the world's largest import market for meats by value, will continue to show modest growth in meat imports at about 1.3 percent a year. Income growth is expected to resume after 2002, at 1.9 percent per year. As this happens, meat consumption will grow slightly. Production of all meats is expected to continue to decline, accounting for some of the growth in imports. Discovery of BSE disease in Japan has shaken consumer confidence and led to a sudden drop in beef consumption. The projection assumes that this will be temporary, and anticipates growth of over 1 kilogram per person per year in beef consumption over the projection period. The renewed use by Japan in 2001 of safeguard mechanisms that raise the gate price of imported pork

is not assumed to alter annual pork supply and demand in a significant way, but will push trade in frozen pork into the second quarter of each new year (i.e., the first quarter of Japan's March-February fiscal year) when the safeguard is not in effect.

South Korea's pork industry has largely worked through the consequences of the 2000 outbreak of foot-and-mouth disease, and hopes to resume exports to Japan in 2002. Korea is expected to both import and export pork in the next decade. Strong demand for pork bellies and certain other cuts in Korea is being met by imported pork. The newly-liberalized beef import market should promote greater imports from the United States and Australia. Strong domestic subsidies for beef in Korea will keep production from collapsing, but are unlikely to lead to increases in production.

Taiwan's livestock sector has been deeply affected by liberalization accompanying its WTO membership application, and by the lingering effects of the 1997 outbreak of foot-and-mouth disease (FMD) on its huge hog farms. In advance of its entry into the WTO, Taiwan's volume of imports for certain formerly banned animal items (offal, chicken meat, and pork belly) has already reached the levels agreed upon for year one of its WTO accession under various bilateral WTO market access agreements with WTO-member countries. The increased competition caused by imports of these animal products will intensify the current structural adjustment in Taiwan's hog and poultry industries.

The outbreak of FMD in March 1997 virtually shut down Taiwan's pork exports and forced Taiwan to cull about one-third of its hog population. Exports of uncooked pork are not expected to resume for a few years, and even then they will show only gradual growth. With a strong poultry industry and a very large domestic demand for pork, however, livestock production is projected to recover gradually from the FMD shock even though Taiwan will still be out of Japan's non-processed pork market until late in the projection period. Feed grain and protein meal consumption and imports, though much smaller than the pre-FMD levels, are projected to recover and grow gradually.

One consequence of increased meat imports in East Asia is reduced demand for feedstuffs for domestic livestock production. Japan will see gradual reductions in feed use, while South Korean and Taiwanese demand will grow only slightly. Korea's feed use is expected to reach levels of the mid-1990s by the end of the projection period, given relatively optimistic projections for poultry meat production.

All three East Asian economies are assumed to maintain tight state control over rice trade. Japan and South Korea will continue to meet their minimum access commitments, but will not import above those levels. The tariff levels for over-quota rice imports announced by Japan prohibit significant additional trade.

Food grain consumption has flattened out in the maturing markets of Japan, South Korea, and Taiwan. Vegetable oil consumption is expected to increase modestly. However, vegetable oil tariffs give a preference for oilseed imports for domestic crushing. In Japan, the major oilseeds for crushing will continue to be soybeans and canola, which will compete on the basis of prices in the meal and oil markets. Palm oil imports into Japan will show some growth because of food

processing needs. In Korea, a near-zero tariff on soybeans encourages their importation. However, soybean crushing in Korea has been put under pressure by the lowering of tariffs on vegetable oil imports, which will continue. Over one-third of Korea's soyoil consumption was imported in 2000, with further growth expected.

The projections assume that East Asian governments will continue enormous expenditures to help domestic agriculture restructure itself. A continued outflow of labor from farming will help full-time farmers achieve larger operations and economies of size.

**Southeast Asia.** The Southeast Asia region is expected to show economic growth in the next decade, but at rates well below those prevailing before the Asian financial crisis in 1997. Import demand for grains, oilseeds, and oilseed products are projected to follow a similar pattern paralleling economic growth. The region's economies presently suffer from reduced demand for manufactured products caused by slower growth in the rest of the world; from competition from China in attracting foreign investment and trade; from inadequate educational infrastructure; and, in the case of Indonesia and Burma, from continued political instability.

Broiler, pork, and egg production are expected to continue to grow quickly, fueled by rising consumer demand over the longer term. Although local feed production is likely to respond to rising demand, most of the region's economies have limited capacities to produce feed energy and protein. As a result, increasing imports of feedstuffs are expected. Increasingly, corn must compete with feed wheat as a feedgrain in nearly all Southeast Asian countries, along with cassava and broken rice in Thailand. Relative prices are critical in determining what is fed. Soymeal use prospects are also linked to the expectations of further growth in animal feeding in the region. Indonesia, Malaysia, the Philippines, Thailand, and Vietnam are all projected to show strong long-term growth in import demand for coarse grains and protein meal.

Rice imports in the region are expected to continue to expand, since Indonesia and the Philippines remain handicapped by land constraints and slow increases in yields, but also are experiencing population growth and substitution of rice for corn in diets. Indonesia's imports are projected to exceed 3 million tons in most years, making it the world's largest importer. Prospects for strong import growth of wheat continue because foods such as noodles and bread account for a growing share of diets in the region.

Large exportable supplies of palm oil from Malaysia and Indonesia continue to depress the world vegetable oil market well into the projection period as new generations of palm tree cohorts begin to produce for the market.

The region is expected to continue to see the expansion of cotton yarn production, boosted by the Multi-Fiber Agreement's phaseout in 1995, as low labor costs spur production of yarn, fabric, and textiles for export.

**South Asia.** India's strong economic growth, projected at about 6 percent per annum during 2002-2011, will provide the potential for demand driven growth in agricultural production and trade. The diversification of farm output and improved agricultural marketing are expected to be key policy challenges during the coming decade, as the government seeks to reduce large food

grain surpluses. More emphasis is expected on improving domestic market institutions and incentives for private sector participation. Despite the removal of quantitative restrictions on agricultural trade in response to WTO commitments, relatively high bound tariffs provide the scope to limit access of most major farm imports. Liberalizing reforms, particularly those that would open trade, are likely to remain slow and gradual in the politically sensitive farm sector.

Large food grain surpluses, particularly of wheat and rice, are the result of high government price supports since the mid-1990s, relatively low market prices for oilseeds and other competing crops, and sharply lower grain offtake from public stocks due to reduced consumer subsidies. Although oilseed prices are expected to strengthen with recent higher oil tariffs, it is unlikely that the government will be able to take swift or decisive action to reduce wheat and rice price supports or to boost their subsidized distribution. The surpluses of rice and wheat are projected to decline slowly during the baseline, with smaller hikes in price supports, reduced government procurement, small increases in subsidized distribution, and modest levels of exports. Rice exports are expected to remain below the levels achieved in the 1990s because high domestic rice prices limit the price competitiveness of India's relatively low-quality rice. The surpluses of mostly low-quality wheat are generally not exportable without subsidy, but low levels of exports to neighboring South Asian and Middle Eastern countries are expected to continue.

India's vegetable oil imports, now the largest in the world, are projected to show strong growth because of rising incomes and relatively slow growth in domestic production. The pace of import growth will hinge largely on future adjustments in import tariffs, and the impact of any adjustments on domestic supply and demand. Tariffs have been increased sharply in the last year, now ranging from 45 percent for soybean oil to 75 percent for crude oils and 92 percent for refined oils, but trade impacts have been limited due to generally weak world prices, particularly for palm oil. It is assumed that the government will maintain the recent higher tariff levels, with import demand being tempered by higher domestic consumer prices and modest gains in domestic production. Crude and refined palm oil products should continue to dominate India's vegetable oil imports, but the relatively low bound tariff on soybean oil is expected to boost the soybean oil share of imports, at the expense of rapeseed and sunflower seed oils.

India's exports of soymeal are expected to continue to grow, but at a slower pace than during the 1990s. Export growth is expected to slow due to area constraints on oilseed production and rising feed demand from the dairy, layer, and broiler sectors. Despite strong growth in mill demand, domestic cotton production continues to be characterized by weak producer prices, inadequate plant protection, low yields, and poor quality. Although yields could be given a quick boost if Bt cotton is approved for cultivation, it is assumed that production and quality problems will be resolved only gradually. Imports are expected to remain relatively high through the projections, with exports recovering slowly.

Economic growth prospects for Pakistan have been weakened by high levels of risk associated with political uncertainty and terrorist activity, declining capital inflows, chronic budget deficits, and continued low rates of domestic savings and investment. Aid inflows may partially offset the economic impacts of the recent actions in neighboring Afghanistan, but income growth through 2010 is expected to remain slower than during the 1990s.

Pakistan sharply reduced wheat imports 2 years ago, largely as a result of a surge in domestic production and a reduction of unofficial exports of wheat and flour to Afghanistan. Increased government price incentives had contributed to more timely planting and consequent higher yields on the large share of wheat area that is double-cropped with cotton. However, the improved wheat productivity comes at the cost of reduced cotton area and yields, and it is not expected that this policy will be sustained over the longer term. Wheat imports are projected to rebound during the projection period, as price incentives shift back in favor of cotton.

Pakistan's cotton yields are expected to grow slowly as pest-resistant varieties are developed and plant-protection practices are improved. Most cotton production is likely to be processed internally to meet domestic and export demand for cotton-based products, and imports of high-quality cottons for blending are likely to rise gradually. Small increases in rice yields will allow rice exports to slowly expand. Vegetable oil imports are projected to show strong, steady growth due to relatively low tariff protection and limited domestic production potential. Growing livestock product demand is expected to lead to increasing soybean meal imports and the emergence of feed corn imports, albeit very small, during the projection period.

Bangladesh is expected to maintain 3.5 to 4.5 percent annual economic growth over the projection period, contributing to moderate gains in imports of rice, wheat, cotton, and vegetable oil. Growth in production of rice and wheat remains slow due to the decisive role of weather which discourages investments in new technology and other inputs. Import levels continue to consist of a mix of food aid and commercial purchases. Demand from the export-oriented garment industry, bolstered by the MFA phaseout, is expected to push up cotton imports. Low tariffs and limited local production will lead to steady growth in imports of soybean oil.

## **Africa**

**Sub-Saharan Africa.** Sub-Saharan Africa's per capita GDP is expected to grow at a positive rate of about 2.5 percent annually over the projection period, representing a significant reversal from the 0.2-percent rate of decline during the 1985-2000 period. However, a high population growth rate and political and social problems in the several of the region's largest countries (e.g., Congo, Sudan, and Zimbabwe) continue to prevent stronger growth. In addition, Sub-Saharan Africa's grain production is not expected to keep pace with the rise in potential demand.

To partially meet this shortfall, total food grain imports are projected to grow about 1.2 percent per year, rising from their current level of about 13 million tons to near 17 million tons in 2011/12. Despite this growth, grain imports only represent about 17 percent of total supplies over the baseline. Furthermore, increases in total food grain consumption are not expected to keep pace with the region's strong population growth, implying a slight decline in per capita consumption of bulk grains over the period.

The region's food grain imports are linked to the global availability of food aid and movements in international commodity prices. Global food aid is assumed constant in value through 2011, but steady increases in nominal commodity prices over the baseline period result in slowly declining food aid volumes (-0.8 percent per year). However, since the region is recognized as the most vulnerable with respect to food security, it is assumed that Sub-Saharan Africa's share

of global food aid donations will rise at a 2-percent rate through the baseline. By 2011/12, the region's share of global food aid is projected at 40 percent, up from a 32-percent share in 2001. Food aid imports are allocated across wheat, corn, and rice with shares of 44, 41, and 15 percent, respectively.

Despite the importance of food aid to the region, food aid imports remain a small share of total grain imports. Commercial purchases currently account for about 80 percent of Sub-Saharan Africa's food grain imports, and this share is projected to remain steady over the projection period. Commercial imports are dominated by wheat (over 50 percent) and rice (nearly 40 percent), with corn, sorghum, and barley comprising the remainder.

South Africa is projected to regain its status as a corn exporter throughout the baseline, bolstered by growing international demand. Small area and yield gains for corn generate an exportable surplus that grows from 1.2 million tons in 2002 to 2.7 million tons by 2011, in large part due to a declining domestic per capita consumption rate for corn.

**North Africa.** Growth in the region's import demand for grains, feeds, and oils is projected to strengthen during 2002-2011, based on the outlook for improved economic growth, but only slow growth in crop output. In Morocco, Algeria, and Tunisia, cereal production improved substantially in 2001 after suffering consecutive droughts the two previous years. As a result, grain imports fall in the early projection years. Longer term, imports of grains and oilseeds are projected to rise as growth in demand for food and feed grain continues to outpace domestic production.

Limited arable land, small farm sizes, limited use of modern production techniques, and the lingering effects of drought all contribute to only modest gains for North Africa's crop production. In contrast, further progress with trade liberalization and privatization programs, and other specific economic reforms in individual countries of the region are expected to help sustain economic growth. The region's GDP is projected to grow at a rate of about 4 to 5 percent over the projection period.

Egypt's large and steadily growing population (estimated at 69.5 million in 2001), coupled with limited arable land and dependence on the Nile for water, is expected to maintain strong demand for wheat and feedstuffs from international markets. Real GDP growth is projected at 4-5 percent annually during the projection period. In addition, revenue from the discovery of sizable natural gas reserves and their development for export is expected to contribute to economic growth when production comes on line in 2003. As a result, rising consumer demand and recent trade policy reforms are expected to generate more growth in corn and soybean imports.

Steadily increasing corn imports are projected in response to the booming poultry and livestock sectors, and to growing demand for starch and sweeteners. Soybean imports are expected to expand rapidly due to the startup, after several years of delay, of two new private soybean-crushing facilities in Alexandria (in late 2001) and in Damietta (in 2002). Consequently, growth in imports of soybean meal is expected to slow. Wheat imports are expected to increase gradually, driven primarily by population growth.

Egypt's rice exports are expected to benefit from a series of mini-devaluation's of the Egyptian pound relative to the U.S. dollar. Egypt's rice production was up sharply in 2001, due to widespread cultivation of a new variety with yields averaging nearly 40 percent higher than traditional varieties. Consequently, rice exports are expected to increase to more than 650,000 tons early in the baseline. However, gradually rising domestic demand is expected to cut into Egypt's export surplus and reduce exports to about 600,000 tons by 2011.

## **Middle East**

Macroeconomic performance in the Middle East region remains strongly tied to the typically uncertain outlook for petroleum export earnings, which are projected to grow slightly faster than inflation through the projection period. In addition, a strengthening global economy after 2003 will benefit the region. Real annual GDP growth is projected at about 4 percent between 2004 and 2011, while population growth is still around 2 percent. As a result, annual per capita GDP growth in the region averages about 2 percent during the period.

**Iran.** Projections for Iran assume a continual movement towards integration into the world economy. Real per capita annual GDP growth is projected at about 2 percent over the period, driving increases in demand for meat, particularly poultry. Growth in the livestock sectors, while sufficient to meet domestic demand, will increase demand for corn, barley, and soybean meal imports, as domestic grain and oilseed production potential is limited. Per capita wheat consumption, already at high levels, is expected to remain flat despite higher incomes. Nevertheless, import demand will continue to rise because of strong population growth and constraints on domestic production.

**Iraq.** Iraq remains bound by international sanctions and government policies that divert domestic resources to support a large military and internal security forces and to key supporters of the regime. Under the UN's oil-for-food program, Iraq is allowed to export as much oil as required to meet humanitarian needs—food, medicine, and some infrastructure spare parts. Oil exports are now more than three-quarters of their pre-war level. Per capita food imports have increased significantly. Domestic agriculture receives very limited internal investment. However, the absence of open conflict in recent years has allowed some modest recovery in crop production. Yet, Iraq remains highly dependent on imports of wheat, rice, and other foodstuffs to meet domestic needs. Increases in coarse grain production are absorbed by the poultry sector where production is projected to rise almost 5 percent yearly. However, poultry production is starting from a small base and no protein meal imports are projected to support its growth. In addition, poultry per capita consumption levels of about 6 to 7 kilograms per person are small compared with other Middle Eastern countries, and are projected to grow only slightly more than 1 percent per year.

**Saudi Arabia.** Saudi Arabia is the world's leading importer of barley, as well as a major importer of rice, wheat, other feed grains, and protein meal. Several factors are expected not only to reinforce this pattern, but to generate increases in import demand for food and feed through the projection period. First, Saudi Arabia's projected population growth rate of about 3.3 percent per year through 2011 is among the highest in the world, implying strong demand growth for calories. In the long run, rapid population growth is expected to undercut GDP gains



and Saudi Arabia's per capita income growth is projected to remain below 1 percent per annum. Although stronger than during the early 1990s, this projected per capita income growth is well below the Middle Eastern average of 2 percent.

Second, the country's economy is heavily dependent on the performance of the petroleum export sector. Saudi Arabia has a fourth of the world's proven oil reserves with one of the lowest costs of extraction, implying high per barrel profits for decades into the future. Third, Saudi Arabia's limited arable land is further constrained by one of the driest climates in the world. The remarkable grain production surge that occurred in the late 1980s and early 1990s came at the expense of the country's precious aquifers. Since the mid-1990s, concern over the depletion of water resources has constrained grain area and production. Fourth, Saudi Arabia (like most Moslem countries) has a strong preference for home-grown livestock in order to ensure that animals are slaughtered according to Islamic Rites. As a result, continued strong expansion of the livestock and poultry sectors to meet growing domestic demand is projected to boost imports of feed grains and protein meals. Fifth, a large expatriate community of "guest workers," many from traditional rice-eating nations of South and Southeast Asia, will continue to fuel demand for wheat and rice during the projection period.

**Turkey.** Turkey's near-term outlook is clouded by the financial crisis of February 2001. The resulting large currency depreciation and fall in income will both work to reduce demand for agricultural imports and will alter Turkey's trade balance in favor of exports early in the period. However, the economy is expected to return to 4-percent annual growth for 2004 through 2011. The strong GDP growth outlook translates into very healthy per capita gains as Turkey's population is expected to grow, but at a declining rate, through 2011 when the population growth rate dips below 1 percent. In addition, continued strong urbanization is expected to drive the demand for increasing shares of meat, fruit, and vegetables in consumer diets. This will impact agricultural trade from two directions. First, high-valued crops such as fruits and vegetables displace traditional grain crops in prime growing areas near major urban cities, thus limiting domestic output of grains. Second, demand-driven increases in livestock production necessitate ever-increasing volumes of grain and protein meal. These two factors motivate strong growth projections for feed imports.

Turkey's poultry industry has suffered from the 2001 financial crisis, due to tight credit availability and a decline in demand. Therefore, a significant, albeit temporary, decline in poultry production is expected. Because of the effect of the crisis on poultry, the demand for soybeans and soybean meal declines slightly in 2002 before growing 3.5 percent per year through 2011. Beef production continues to grow unabated by the current crises and, along with it, feed grain imports continue to grow (over 6 percent per annum) through 2011.

Textiles and clothing are Turkey's most important industry and largest exports. Cotton imports are projected to increase modestly in the next few years. However, the longer run scenario for cotton in Turkey depends primarily on two factors. First, the phaseout of the Multi-Fiber Agreement (MFA) will favor cotton imports and textile production by low-wage labor markets (see box, "Effects of the Multi-Fiber Arrangement Phaseout in 2005"). The MFA phaseout is assumed to benefit Turkey's textile and clothing sector, and to keep milling demand for raw cotton growing steadily through 2011. Second, the completion of the Southeast Anatolia GAP

irrigation project is expected to double cotton production in Turkey and lead to a long-term decline in cotton imports. However the project's completion date has proven elusive, despite forecasts that it will occur sometime between 2005 and 2010. It is assumed to come online gradually during this baseline, and result in no growth in imports after 2004.

### **Strong Growth in Feed Demand Projected for North Africa and the Middle East**

Already a major destination for global feedstuffs, North Africa and the Middle East (NAME) is projected to experience continued growth in import demand for grain and protein meals through 2011. Coarse grain imports into the region are projected to expand by 34 percent from 24.5 in 2001 to 32.8 million tons—over one-fourth of total world coarse grain imports—in 2011. Imports of soybeans and soybean meal (in soybean equivalents) are expected to expand by 36 percent from 8.3 to 11.3 million tons, for nearly an 8-percent share of world imports. Rising populations (projected to grow about 1.6 percent annually through 2011), and an increasing average real GDP growth rate (forecast between 4-5 percent annually in most countries) are expected to sustain strong demand growth for animal products—the real catalyst behind growing feed demand.

Currently, many of the countries within NAME maintain restrictive policies on imports of poultry and red meat, including outright bans and/or high import duties, in order to bolster domestic production. Most Moslem countries have a strong preference for home-grown livestock in order to ensure that the animals are *Halal* (lawful) and *Zabihah* (slaughtered according to Islamic Rites) in order to be suitable for consumption. Strong regional demand for animal products has bolstered NAME's output of animal products between 1990 and 2001. Poultry production grew at an annual rate of 4 percent over this period; red meats, 1.8 percent; eggs, 2.6 percent; and milk, 2.1 percent.

Feed requirements have grown in step with the livestock and poultry sectors. However, most NAME countries share the common circumstance of limited arable land and inadequate water resources which constrain their capacity to produce feed grains and oilseeds.

### **Limited Resource Base Constrains Feed Production**

Traditionally, animal feeding in NAME countries relied mostly on combining small quantities of coarse grains and oilseed meals with crop residues such as straw from wheat, rice, and barley, or stalks from corn, sorghum, and cotton. With the modernization of animal husbandry practices and the introduction of feed manufacturing, the use of feed concentrates based on coarse grains and protein meals has increasingly replaced traditional feedstuffs.

In 2000, the NAME region was home to over 381 million people. The region's population is projected to grow at a robust 1.8 percent annual rate, pushing the total population to 463 million by 2011. However, prospects for meeting the region's growing feed requirements internally are dim based on limited grain and oilseed production potential. According to FAO, only about 6

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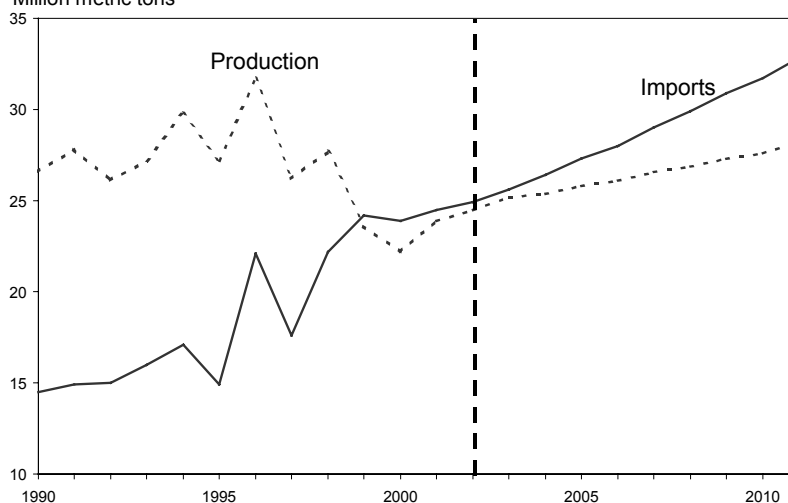
## Strong Growth in Feed Demand Projected for North Africa and the Middle East--continued

percent—64 million hectares—of the region's total land area is suitable for crop production. Of this area, 13 percent or 8.3 million hectares is dedicated to tree crops. Almost one-third of the area under crop production depends on irrigation water to produce a harvest. Growing populations, particularly in large urban centers, are gradually cutting into the water supplies available for irrigation. Salinity is a constant problem. In addition, non-irrigated cropland is subject to the region's highly erratic and unpredictable rainfall patterns.

Almost 29 percent, 302 million hectares, of total land area is used for pasture (FAO). However, the efficiency of livestock grazing is closely related to precipitation, which largely determines the amount of forage produced. Widespread drought across most of North Africa in 1997 and again in 1999 and 2000, severely curtailed forage production and necessitated large increases in feed imports. Parts of the Middle East experienced severe drought in 1999 and 2000. Some modest recovery occurred in 2001, although some countries in the region—Eastern Turkey, Iran, and Iraq—still suffered drought in 2001.

Poor precipitation in recent years has had important consequences on production and trade. NAME's coarse grain production declined from 31.7 million tons in 1996 to only 22 million tons in 2000, and oilseed production was also reduced (figs. 5 and 6). Consequently, import demand has risen sharply to meet domestic feed requirements. A return to more normal precipitation patterns is expected to slightly reduce cereal and protein meal demand in 2002 and possibly 2003. Longer term, the region's grain and oilseed production is projected to resume normal growth and approach the record levels of the mid-1990s. However, the region's growing demand for animal feeds is expected to outpace domestic output growth by 2004, and once again generate record import demand through the remainder of the projection period.

Figure 5  
**Limited production growth projected to bolster coarse grain imports by the North Africa & Middle East (NAME) region\***  
Million metric tons



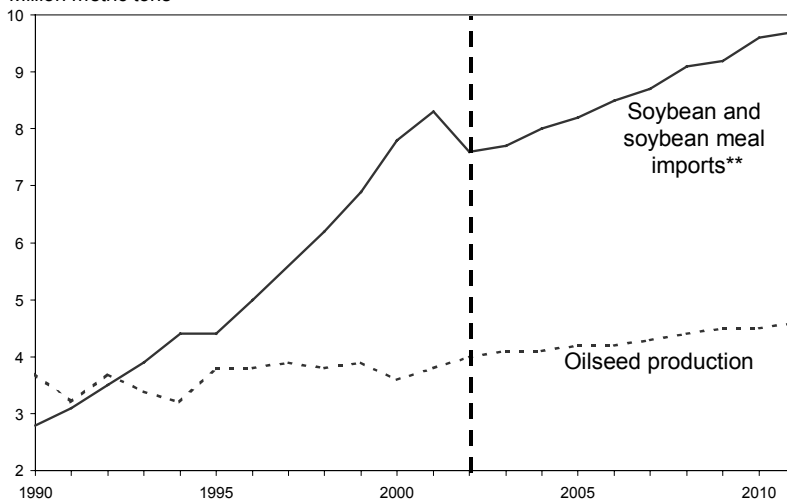
\*Baseline projections, 2002-2011.

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## Strong Growth in Feed Demand Projected for North Africa and the Middle East--continued

Figure 6  
**Soybean and soybean meal imports by NAME countries  
projected to grow robustly through the projection period\***

Million metric tons



\*Baseline projections, 2002-2011.

\*\*In soybean equivalents.

### Growing Feed Import Dependency

The widening imbalance between feed requirements (especially those providing high energy and crude protein) and feed production has translated into increasing dependency on international markets for coarse grains and oilseeds. In the past several years, the value of feed imports into NAME countries has exceeded \$3 billion. Nearly three-fourths of feed imports have been coarse grains, while oilseeds and protein meals have comprised over 20 percent. The rest has been small amounts of prepared feeds, fish and meat flour, bran of cereals, and alfalfa.

Between 1990 and 2001, soybean and soybean meal imports in soybean equivalents grew from a 70-percent share (2.8 million tons) of domestic use to a 77-percent share (8.4 million). During the same period, the corn-import share expanded from 46 percent (6.6 million tons) to 63 percent (15.3 million), and the barley-import share rose from 31 percent (7.4 million) to 43 percent (9.4 million). This pattern of import dependency has been reinforced by the development of new marketing structures since the late 1980s resulting from widespread policy reforms that greatly liberalized trade in many NAME countries. Thirteen of the 22 countries in the NAME region are WTO members and can be expected to continue to reform their trade practices. Another 4 countries (Algeria, Lebanon, Saudi Arabia, and Yemen) have WTO observer status and will begin or have already begun negotiations for accession. Only Libya, Iran, Iraq, and Syria do not participate at any level in the WTO.

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### **Strong Growth in Feed Demand Projected for North Africa and the Middle East--continued**

The United States has been a major beneficiary of NAME's growing feedstuff imports. By 2000, the NAME region was the largest foreign market for U.S. soybean meal (accounting for 21 percent of total U.S. soybean meal exports) and the second largest market, after Japan, for U.S. corn with a 22-percent share of total U.S. corn exports.

In the mid-1990s, corn overtook barley as the principal coarse grain imported by NAME countries, due mainly to rising poultry production. Egypt is traditionally the region's largest corn importer, generally taking about one-third of the region's imports, although Saudi Arabia, Algeria, Turkey, and Iran each import more than 1 million tons annually. The United States—the region's largest corn supplier—has more than doubled its exports to NAME countries in the past 10 years, from under 5 million tons in 1989 to over 10 million in 2000. During the projection period, corn imports are expected to account for an ever-increasing share of the region's total coarse grain imports, rising from about 59 percent (14.6 million tons) in 2002 to 62 percent by 2011 (20.4 million tons).

The NAME region represents the world's largest barley importing block, averaging over 9 million tons (55-percent of world imports) since 1996. Saudi Arabia is the region's principal barley importer with nearly a 30-percent global market share. Major competitors for NAME's barley imports include the EU—France, Germany, and the United Kingdom—and Australia. NAME imports of other coarse grains—such as sorghum, rye, and oats—are relatively minor.

### **NAME's Oilseed Crush Gaining in Importance, But Meal Imports Still Dominate**

Oilseed-based meal production has been increasing steadily in NAME countries since the early 1990s. However, most NAME countries still import the majority of their protein meals (over 60 percent of the region's consumption was imported in 2000), due to a lack of modern crushing facilities. But the region's crushing capacity is expected to expand rapidly in the next several years as at least 11 new soybean processing plants are in various stages of construction throughout the region—3 plants in Iran, 2 plants each in Egypt and Dubai, and 1 plant each in Jordan, Syria, Tunisia, and Turkey. The combined capacity of these plants is estimated to approach 8 million tons per year. Many of the countries where the plants are being built have variable import tariffs that favor the import of whole oilseeds instead of meals and oils, and virtually assure a profitable crush margin. As these plants gradually come on line, it is expected that they will result in a shift from meal and oil imports to increases in whole seed imports for domestic crush. For example, two new, private crushing facilities scheduled to start operations at the end of 2001 in Alexandria and in 2002 in Damiatta, Egypt (with capacities of 5,000 and 1,100 tons per day, respectively), are expected to rely totally on soybean imports.

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### **Strong Growth in Feed Demand Projected for North Africa and the Middle East--continued**

Soybean meal's share of the region's protein meal production has grown steadily from 42 percent in 1990 to 57 percent in 2001. The rapid increase has mainly been due to two factors. First is a preference for soybeans by the domestic oilseed crushing industry. Second is a decline of cotton-sown area, and consequently cottonseed and meal production. As a result, soybean meal has been replacing cottonseed meal in feed concentrates. Traditionally, cottonseed dominated the region's production of oilseeds, accounting for about 60 percent of oilseed harvested area and 70 percent of oilseed production in recent years. However, area has been leaving cotton since 1996 due to declining relative returns, and production has been stagnant despite strong yield gains.

Soybean production is fairly new to the region and, despite a preference for soybeans by domestic crushers, farmers consider current yields too low to compete with other crops for the use of land. It is expected that soybean yields will not increase sufficiently to generate profitable returns during the projection period, thereby maintaining the region's strong dependence on foreign sources for both oilseeds and protein meals.

NAME's total oilseed meal imports—composed of 90 percent soybean meal, 9 percent sunflower, and the rest cottonseed, rapeseed, and linseed meals—more than doubled from 2 million tons in 1990 to 5.1 million tons by 2001. Total soybean meal imports for the region are projected to grow to 6.1 million tons by 2011. Egypt, Saudi Arabia, and Turkey are the principal recipients of soybean meal shipments to the region.

In terms of whole oilseeds, nearly two-thirds of NAME's oilseed imports have been soybeans in recent years, while the rest has been primarily sunflower seeds and cottonseed. Soybean imports by the region are projected to grow from about 2.6 million tons in 2002 to 3.6 million tons in 2011. Historically, the United States has been the principal supplier of soybeans to the region. However, since 1997, Argentina and Brazil have entered the NAME market and are now aggressively competing with the United States. As a result, the United States has seen its market share decline from a pre-1998 average of 93 percent to only 58 percent by 1999, while Argentina's and Brazil's shares have grown to 15 and 10 percent, respectively. About half of U.S. soybean exports to NAME are shipped to Israel, which has the largest crushing capacity in the region, with Turkey and Egypt taking about 40 percent.

Imports of sunflower seeds into the NAME region have also increased sharply over the past decade and now account for about a fourth of all oilseed imports. Turkey has been the largest single importer, taking over half of the region's imports. Jordan and the United Arab Emirates are also significant importers of sunflowers. Other oilseed imports such as cottonseed, rapeseed, linseed, safflower, and sesame come primarily from the EU, but generally account for less than 10 percent of total oilseed imports. During the projection period, soybean's share of oilseed imports is expected to grow to about 80 percent, while sunflower's share dips to about 16 percent.

## **Western Hemisphere**

**Canada.** Canada is projected to remain a major producer and exporter of wheat (spring wheat and durum), barley, oats, rapeseed, beef, and pork through 2011. A small domestic market keeps Canada's agricultural sector focused strongly on the international marketplace where the outlook for a return to growth for the world economy by 2003, particularly for the United States and Asian economies, is expected to improve Canada's export prospects. In addition, exchange rates are expected to favor Canada's export competitiveness in international wheat, rapeseed, and meat markets. The Canadian dollar is assumed to continue to weaken vis-à-vis the U.S. dollar, devaluing by an additional 4 percent over the projection period.

Canada is the world's second largest country with nearly 10 million square kilometers. However, a short growing season (90-120 days) limits production to spring-planted small grain and oilseed crops through most of Canada's vast central Prairie provinces of Alberta, Saskatchewan and Manitoba. Returns in the near term favor wheat recapturing some of this area. Over the longer term, however, the more rapid growth in global vegetable oil and meal demand is expected to increase the competitiveness of oilseeds, particularly canola.

Canada's wheat and oats exports are expected to resume steady annual growth rates (nearly 1 percent for wheat and just under 2 percent for oats) through 2011, after recovering from weather-reduced supplies which led to a drop off in exports in 2001. Canada's barley exports (particularly malting barley) also make a strong recovery, but strong international competition and increased domestic feed demand are expected to dampen exports of feed barley mid-way through the period, before some recovery is made after 2008. Malt barley exports remain strong and represent a growing share of Canada's total barley exports.

Canadian canola has a high-quality oil component with nearly a 40-percent crushing yield. As a result, Canada's rapeseed exports are projected to benefit from increasing global demand for vegetable oils through the projection period, but exports and production gains remain modest due to strong competition for area from wheat and barley, and strong international competition from other oilseeds, particularly soybeans and palm oil.

The elimination of freight subsidies in 1995 continues to shape the outlook for Canadian agriculture and trade. In particular, the livestock sectors have benefited from the reductions in domestic grain and oilseed prices that have resulted from the rising cost of moving grain from the interior Canadian prairies to export positions on the west coast or the St. Lawrence Seaway. Also, U.S. and EU farm subsidies have helped Canadian livestock producers by lowering feed grain prices at the expense of grain farmers.

Continued expansion in hog production and slaughter capacity is expected to lead to increased hog slaughter in the coming years. Processing plants that have yet to increase capacity, and even some that have, are expected to continue to expand to compete for a share of the increase in hog supply. Pork exports, which almost doubled between 1996 and 2001 to about 710,000 tons, are expected to continue to increase, albeit at a slower pace than the 1990s, averaging 1.8 percent

annually through 2011 when exports exceed 860,000 tons. Beef exports are projected to grow at a faster pace (2.8 percent per annum) reaching 759,000 in 2011.

Along with the expansion in livestock production, feed demand is expected to increase. Canada imports modest amounts of soybean meal from the United States. However, protein meal has encountered increased competition from dry peas (field peas) in livestock rations. Canadian production of dry peas has increased significantly since the mid 1990s. Much of the projected increase in energy demand is expected to be met by strong yield growth in domestic corn production and by increased feeding of barley. However, there is considerable uncertainty surrounding this outlook as potential corn area is limited to southern and southeastern Ontario and the extreme southwestern corner of Quebec where the growing season runs from 120 to 150 days. Corn competes with soybeans and winter wheat production in this southeastern part of Canada. With the type of growth expected in Canada's livestock industry in the next decade, favorable feed grain price projections are necessary for domestic production to keep pace with feed demand. Otherwise look for increased feed imports, particularly U.S. corn.

Production of specialty crops, including peas and lentils, has also benefited from the 1995 transportation reform, as producers have moved to diversifying their operations. In addition to specialty crops, canola production and processing has also expanded to take advantage of value-added opportunities. A greater percentage of canola production is expected to be crushed domestically. As a result, the growth rate of oil and meal exports is projected to be significantly higher than that of seed exports. Exports of high-value products have recently overtaken bulk commodity exports as the largest earner of foreign exchange in the agricultural sector. This pattern is expected to continue through the projection period.

Another uncertainty is the extent to which the easing of budgetary pressures translates into expanded support for the agricultural sector. Depressed agricultural commodity prices of the past three years have strained Canada's agriculture. The federal and provincial governments have several programs in place to help support domestic agriculture, although expenditures remain considerably lower than in the 1980s. Current programs include the Net Income Stabilization Account, Crop Insurance, the Canadian Farm Income Program (which went into effect in 2001), and various Provincial Stabilization programs. The government is concerned, however, that current payments have become too focused on emergency aid. It is currently exploring the feasibility of revamping farm income safety net programs with a comprehensive policy that would require farmers to comply with rigid environmental, food safety, and risk management provisions if they expect to qualify for aid. As of the completion of this baseline, no decisions had been made on changing current policies, and similar levels of support are assumed under the baseline. Other policies assumed to remain in place include the Canadian Wheat Board's monopoly marketing powers over wheat and barley in Western Canada and the supply management programs for dairy, eggs, and poultry products that isolate these products from world markets.

**Mexico.** Mexico is expected to show the fastest economic and population growth of the 3 North American countries over the next decade. Strong per capita real GDP growth (3 percent annually), along with trade liberalization and domestic policy reform, will be the key factors shaping the outlook for Mexican agriculture during 2002-2011. Production capacity will remain



limited by scarcity of water and land, and by low levels of technology, while rising incomes drive up demand for livestock products and feeds. Mexico is expected to be a progressively larger importer of grains, oilseed products, and meats during the projection period.

In recent years, Mexico has experienced increasing domestic pressure to limit imports, in large part because of continued low internal prices for most agricultural commodities and concern about the impact of eliminating TRQs in the next few years. However, longer-run agricultural policy is expected to continue to be driven by the Alianza para el Campo, of which the PROCAMPO program is a major component, and by NAFTA. Under PROCAMPO, the government continues to reduce its role in supporting grain prices. PROCAMPO direct payments, which require planting but are otherwise decoupled, will continue to be phased out. Mexico is also expected to continue to reduce consumer subsidies. Stiff competition from imports is expected to reduce area planted to coarse grains and limit wheat area.

Under NAFTA, all tariffs on baseline commodities will be eliminated by 2008, with a number of them being eliminated in 2003. Because of the price-competitiveness and quality of U.S. corn, pork, poultry, and eggs, it is assumed that Mexico will import at least the tariff-rate quota quantities. In the case of poultry, it is assumed that Mexico will continue to not enforce the TRQ, leading to modest growth in imports from the United States.

New programs aimed at improving agricultural productivity are assumed to have a small impact on farm output during the projection period. The new programs include initiatives for water distribution and irrigation investment, improved genetic material and equipment for livestock producers, technology transfer for the cattle and oilseed sectors, certified seed exchange, and an extension initiative for corn. The objective is to provide producers with the tools to operate in an environment largely free of government intervention but, until there is concrete progress in implementing the programs, it is assumed that impacts will be relatively small.

**South America.** Growth prospects for the region are dominated by the two largest economies in the region, Brazil and Argentina. Virtually all of the region's economies are expected to register strong economic growth starting in 2003 (at or above 4 percent per year), with the exception of Argentina whose recovery starts later (2004) and is less robust (averaging slightly above 3 percent per year).

**Argentina.** From 1991 through 2001, Argentina maintained a one-to-one link between the peso and the U.S. dollar, in nominal terms. This link is assumed to continue throughout the baseline, and does not reflect the currency devaluation of January 2002. In real terms, however, the baseline assumes the value of Argentina's peso depreciates slightly against the dollar through the projections. This real exchange rate assumption helps to maintain Argentina's competitiveness vis-à-vis the United States.

Argentina's agricultural production is expected to grow strongly through the projection period, however, it becomes more focused on its top export earning commodities—soybeans and soybean products, wheat, and corn—following the recent trend. Between 1999 and 2001, area devoted to soybeans, wheat, and corn has increased by about 15 percent, while area planted to sunflower seeds, sorghum, barley, and rice has declined by nearly 38 percent. However, most

future growth is derived from higher yields, rather than area expansion. Total crop area is projected to expand at a meager rate of only 0.3 percent per annum. Yields of wheat and corn are still considerably lower than in the United States, but continued adoption of higher-yielding plant varieties and more intensive input use are expected to generate a steady 1-percent yield growth for most crops.

Argentina's soybean production is projected to grow at a 2.7 percent annual rate based on both area and yield gains. An efficient crushing sector with plenty of capacity is expected to help maintain Argentina's status as the world's leading exporter of soybean products. Exports of both soybean meal and oil grow in excess of 3 percent per year, compared with soybean export growth of slightly more than 2 percent.

Argentina's livestock sector was dealt a severe blow when a widespread FMD outbreak in March 2001 was followed with bans on imports of Argentine "fresh and chilled" beef by the United States and other importing countries. Argentina had just recently obtained FMD free status and was hoping to target beef exports to high-valued markets in the United States and East Asia. Instead, most of Argentina's beef exports to those markets will be limited to processed products for the foreseeable future. As a result, beef and veal production in Argentina grows at a slow 0.8-percent annual rate during the baseline, and Argentina's beef exports (which show continued growth) are expected to remain far below their levels of the mid-1990s.

**Brazil.** Brazil's agricultural production and trade prospects are extremely favorable in the long-term, and are expected to benefit from on-going improvements in infrastructure. Improvements in waterway and railroad transportation systems are expected to lower both internal production costs and commodity export prices. Production costs decline due to falling costs of delivering inputs to producers in the interior. Export prices are lower because the products are produced more cheaply and because the transport cost of the back haul from the production site to the export position is lower. The result is increased competitiveness for Brazil commodities in international markets.

The conversion of undeveloped land to arable land in Brazil's interior states is expected to gain momentum in the next decade, leading to further gains in soybean, corn, and cotton area and in cultivated pastures to support livestock expansion. Such area growth will raise national average yields for each of these crops and benefits will be realized from large farm sizes and use of "state-of-the-art" technology in expansion areas. Furthermore, this expansion will push soybean production from these areas far beyond that of the traditional producing areas in South and Southeast Brazil. However, infrastructure development remains the key to the pace of agricultural expansion in the vast interior lands.

Brazil's soybean production is projected to grow at a remarkable 5 percent annual rate based on both rapid area gains in excess of 3 percent per year as soybeans capture the lion's share of new cropland expansion. Yield growth of about 1 percent per annum also contributes to output growth. Brazil's crushing sector is less efficient than that of its two principal competitors—the United States and Argentina—yet Brazil is expected to maintain its status as the world's second-leading exporter of soybean products behind Argentina. Brazil's exports of soybean and soybean meal (in soybean equivalents) are projected to grow by nearly 5 percent per year,

pushing Brazil's total world market share from under 28 percent in 2001 to almost 35 percent in 2011. Brazil's soybean oil exports also respond to growing global demand for vegetable oil and grow rapidly starting in 2006.

Production gains in corn and soybeans will fuel growth in Brazil's rapidly expanding poultry and pork sectors. Increased meat production is expected to generate strong growth in exports of both poultry and pork.

Area planted to wheat in Brazil is expected to show little growth, however, because production in the temperate southeastern areas faces competition from more efficient producing areas in neighboring Argentina and current varieties for these crops are not economical to produce in the tropical setting of the country's interior. As a result of limited wheat production growth in the face of strong urbanization and income growth, Brazil's wheat imports are expected to grow at about 3 percent annually, reaching 9.7 million tons by 2011. This import level maintains Brazil as the world's leading wheat importer throughout the projection period.

### **Transition Economies**

**Former Soviet Union (FSU).** The countries of the former Soviet Union (FSU) are richly endowed in natural resources, and Russia, Ukraine, and Kazakhstan have the potential to develop into agricultural powerhouses. However, such development is not expected to occur during this baseline projection period, as agricultural production for the FSU countries remains below the high levels achieved, albeit with the aid of large subsidies, during the mid-1980s. In general, the agricultural sectors of the FSU countries are still mired in the remnants of the old Soviet system and are struggling to establish market economies. Poor production incentives within the large agricultural collectives of the region continue to subvert potential productivity gains. Russia's agricultural sector, largest of the region, remains beset by uncertainty over land ownership rights which has discouraged needed investment and restructuring. Agricultural productivity throughout the FSU region is expected to rise only slightly during the next decade. This reflects pessimism that Russia and its FSU neighbors will enact the institutional reforms in agriculture necessary to promote productivity growth.

Both Russia and Ukraine have large areas of arable land, well-suited for field crop production. However, Russia has historically been unable to meet its own internal demand for grain. Despite being one of the world's leading wheat producers, Russia has sustained large net imports of wheat for most of the past several decades. This pattern is expected to continue through the projection period with Russian net wheat imports of between 2 to 2.5 million tons per year. In addition, Russia is expected to import increasing quantities of corn reaching nearly 1 million tons by 2011. Barley is expected to be Russia's only grain crop produced in excess of domestic demand. Russia's barley exports (predominantly feed barley) are projected to range from under 1 million tons to about 1.5 million by 2011.

Most of Russia's wheat and corn import needs will be met by other FSU countries, particularly Kazakhstan and Ukraine as they can offer the lowest price and suspect quality may put off many other international buyers. The fertile black soil of Ukraine is among the world's finest and has traditionally generated more than one-fourth of former Soviet agricultural output of meat, milk,

grain, and vegetables. An area almost the size of Texas, Ukraine's population of 49 million is small relative to its agricultural output leaving sizable exportable supplies. Ukraine is expected to be a major exporter of wheat (2.5 to 5.8 million metric tons) and coarse grains (1.5 to 3.5 million metric tons) through the baseline period. Kazakhstan wheat is expected to dominate grain production in the "other FSU" countries. "Other FSU" wheat exports are nearly 2 million tons early in the projection period (mostly destined to Russia and nearby markets), but decline to about 0.5 million tons by 2011 as rapidly growing internal demand cuts into exportable surplus production.

Russia and Ukraine—the two pre-eminent economies and agricultural producers within the FSU—enjoyed marked economic growth in 2001, due to the continued recovery from the 1998 financial crisis in Russia. The financial crisis triggered the exodus of capital from the country, which caused the ruble to depreciate severely. A capital flight contagion effect caused Ukraine's currency to depreciate as well. The currency depreciation stimulated domestic agricultural production by substantially improving the price competitiveness of domestic producers vis-à-vis the world market. High oil prices have also allowed the Russian economy to prosper. GDP in both Russia and Ukraine is projected to grow at average annual rates of about 4 percent through 2011.

The populations for both Russia and Ukraine are projected to decline over the projection period. However, their improving economies are expected to lead to an increase in food consumption, particularly of meat, driven by rising per capita consumption rates for all three meat groups—beef, poultry, and pork—through 2011. Ukraine's domestic livestock sectors are projected to grow sufficiently to cover the increase in internal demand. Russia's livestock production remains costly and inefficient, and is unable to respond to rising demand. As a result, meat imports by Russia are expected to grow strongly through the forecast period. In 2001, Russia was the world's leading importer of poultry meat, second leading importer of pork, and third leading importer of beef. These rankings are preserved in the baseline. U.S. poultry exports to the FSU region have already rebounded in 2001 to pre-crisis levels and are projected to capture most of Russia's projected imports of 1.9 million tons by 2011. Russia's beef imports are primarily from the EU, while Brazil and the EU are expected to vie for Russia's pork trade.

**Central and Eastern Europe (CEE).** As a region, the countries of Central and Eastern Europe continue to reform their economies, a process started in the early 1990s. By and large, the region's agricultural potential remains underdeveloped, although some progress has occurred in recent years and is projected to continue through the baseline. Significant foreign investment in the region has increased productivity in both farming and the food processing sectors.

Strong GDP growth rates in the 4 to 5 percent per annum range across the region are projected through 2011. With almost no population growth in the outlook, the strong income growth translates into very robust per capita income gains and significant growth in demand, particularly for animal products. The livestock sectors begin to grow, albeit slowly. As a result, protein meal imports rise modestly through the projection period. Most meat output growth is for internal consumption, but some pork and poultry exports begin to emerge during the projection period.

Coarse grain production in Central and Eastern Europe begins to recover from the decline engendered by the transition from communism to democracy, but, production remains far below the levels reached in the early 1980s. However, significantly lower animal populations permit some of the production gains to enter international markets. Corn exports from the region grow rapidly (9.5 percent per year) and reach a projected 6.1 million tons by 2011.

Most CEE countries are members of the WTO and have been since the mid-1990s. None of the countries are projected to accede to the European Union during the baseline period, although as many as eight countries could join by 2005. FSU countries remain major trade partners, especially for Poland. However, the sharp drop off in exports to Russia associated with the currency crisis of 1998 has led to a reorientation of their trade to Western Europe.

### **Commodity Trade Highlights**

#### **Coarse Grains**

Demand for coarse grains is expected to grow robustly over the next decade, driven by widespread economic growth and expanding meat production. World coarse grains trade is expected to reverse a period of stagnation that began in the early 1980s, and grow 2.2 percent annually from 2002 to 2011. Rising incomes and associated gains in per capita meat consumption, particularly in developing countries, are key drivers of projected gains in coarse grain use and trade.

About two-thirds of global coarse grain supplies are used as animal feed. Coarse grain that is traded is also primarily used as feed. A key factor that weakened global coarse grain demand during the 1990s was the drop in livestock numbers and feeding that occurred in the FSU and CEE as these economies underwent structural reform. However, steady long-run growth in the livestock sectors of developing countries in Asia, Latin America, North Africa, and the Middle East is expected to overtake and replace the lost feed demand of the FSU and CEE. Global coarse grain trade is projected to surpass the 1981 record of 108 million tons in 2006 and expand to nearly 127 million tons by 2011.

Industrial uses, such as starch production, ethanol, and malting, are relatively small but growing. Food use of coarse grains is concentrated in parts of Latin America, Africa, and Asia and has generally declined over time as consumers tend to shift consumption toward wheat, rice, or other foods as their incomes rise.

Higher coarse grain imports are projected for China, North Africa, the Middle East, Southeast Asia, and Latin America. East Asian imports are projected to remain mostly steady, as these countries tend to maintain stable domestic livestock and poultry production, while meat imports satisfy most of the growth in internal demand. Taiwan's and South Korea's feed grain imports are expected to increase slowly, while Japan's decline. After slow growth in the first year of the baseline, reflecting recovery from drought, feed grain imports by North Africa and the Middle East are expected to show strong long-term growth and represent a growing share of global coarse grains demand. The FSU, one of the world's largest importers during the 1980s, is

expected to be a modest net exporter of coarse grains, mostly barley, as animal numbers increase only gradually.

Except for corn, coarse grain area has been falling for decades in most countries, as producers turned to more profitable crops. Foreign corn area is expected to continue to increase at the strong pace of recent decades and, with corn yield growth much stronger than for other coarse grains, corn will increasingly dominate feed grain markets while sorghum and feed barley production decline. However, growing demand and attractive prices for malting barley are expected to provide some support to global barley area and production.

U.S. exports of coarse grains are projected to decrease initially in 2002 because of expected strong competition from Canadian and EU barley and Argentine corn exports. In the longer run, the CEE and FSU regions are also expected to expand coarse grain exports. U.S. coarse grain exports expand after 2002, but competition remains strong.

World corn trade echoes total coarse grain trade by first declining in 2002, before growing throughout the rest of the baseline period. Global corn trade is expected to exceed the 1989 record of 80 million tons in 2007, reaching 92.1 million tons by 2011. The largest gains in corn imports are expected to occur in China, Southeast Asia, Latin America, North Africa, and the Middle East, where demand for livestock feed is expected to expand steadily but production potential is limited. With China reducing corn exports during most of the period, Argentina, Eastern Europe, and the United States will be the major beneficiaries of increasing import demand for corn.

U.S. corn exports are expected to decline in 2002, largely due to reduced Canadian imports, before growing through the rest of the period. U.S. corn exports increase to 61.6 million tons in 2011, slightly below the 1979 record level of 61.8 million. The United States remains the dominant exporter in world corn markets, accounting for more than two-thirds of global corn trade through the period.

Global barley trade is expected to expand throughout the baseline at a 2-percent annual rate. Import growth is expected in China and other malting barley markets. Feed barley imports by North African and Middle Eastern countries (dominated by Saudi Arabian imports) are expected to expand slowly through the period. Australia and the FSU and CEE regions gradually increase their barley exports over the baseline period, while exports from Canada and Turkey decline. Canada's barley exports expand in 2002, but the higher profitability of other crops is expected to lead to a decline in barley area and exports thereafter.

The EU, with abundant barley supplies, increases its barley exports by nearly 4 percent per annum and is the world's leading barley exporter throughout the period. In light of projections for a weak euro and lower internal prices due to Agenda 2000 reforms, expected market prices indicate that EU barley can be exported without subsidy throughout the baseline. Instead, WTO limits on subsidized EU coarse grain exports are shifted from barley to rye and oats. However, the EU is expected to have difficulty finding markets for its large rye stocks.

Sorghum trade is projected to increase gradually (1.5 percent per year) through the baseline, driven almost entirely by Mexico which favors sorghum imports as less politically sensitive than corn.

## **Wheat**

World wheat trade (including the wheat equivalent of wheat flour) is projected to grow at a 2.5-percent annual rate from 2002 through 2011. This projected growth rate is a reversal of the 1980s and 1990s when trade either declined or stagnated. Growth in imports is concentrated in the developing countries, primarily North Africa, the Middle East, Brazil, China, and Pakistan. Import demand from Mexico and Sub-Saharan Africa is also expected to grow steadily over the period. Wheat exports by most major exporters rise over the period. The EU gains market share of world wheat exports through 2011, while the United States' share holds fairly steady. The export shares for all other major exporters including Canada, Australia, and Argentina decline.

Developing countries, bolstered by strong growth in North Africa and parts of the Middle East, account for most of the projected increase in global import demand. Per capita income growth in developing countries is expected to encourage a shift in consumption from roots, tubers, pulses, and coarse grains to more wheat-based products. Developing-country wheat import demand is further reinforced by population growth rates that remain nearly double the growth rates of developed countries. In developed countries, per capita income growth is associated with greater consumption of wheat use in processed food products, but a shift away from unprocessed wheat-based products. In the United States, total use of wheat is growing sluggishly as increases in food use are driven almost exclusively by very modest population growth. The very slow growth in U.S. domestic use underscores the importance of global trade for future U.S. wheat production and prices.

Limits on export subsidies included in the Uruguay Round agreement, as well as budgetary pressures, are expected to make export subsidies less important in the future than they have been in the past for determining wheat market shares. The baseline assumes that none of the budgeted U.S. EEP funds are used for wheat exports through the projection period. Instead, exporter market shares are likely to be determined by the cost effectiveness of wheat production, transportation, and marketing.

After initially declining in 2002/03, U.S. wheat exports are expected to grow through the rest of the projection period. Nevertheless, the U.S. share of the world wheat market holds in a 24 to 26 percent range, below its trade share of the late 1990s, due to continued competition. The EU is expected to boost market share significantly over the next several years as projections of a weak euro allow wheat (and barley) to be exported without subsidies. Agenda 2000 reforms lower internal grain prices early in the projection period. However, a projected decline in the crop area set-aside rate, limited cropping alternatives, and abundant wheat stocks will fuel exports through 2011. The EU share of world wheat trade is projected to increase from 14.5 percent in 2002 to 21 percent by 2011.

Weak exchange rates are also expected to encourage wheat exports from the FSU and CEE. In addition, these regions are expected to see production boosted by steady growth in yields through

the projection period, further increasing exportable supplies. Throughout the period, the FSU is projected to become a growing net exporter of wheat. Within the FSU, Russia remains a net importer of between 2 to 3 million tons of wheat, while Ukraine and Kazakhstan are expected to expand their production and exports.

In Canada, reform of the transportation system that reduced the Canadian Wheat Board's favored status and increased demand for barley are expected to keep wheat area from expanding. Canada's wheat yield growth was very slow over the last decade and, given varietal constraints, is projected to remain limited for the next decade. As a result, increased domestic demand is expected to limit export growth. In Australia, increasing wool prices and limited areas with enough rainfall will lead to some wheat area contraction. Argentina is expected to shift area between wheat, corn, and oilseeds, depending on which has the most attractive world price, but total area is limited. Productivity gains for corn are expected to outpace wheat, causing a gradual decline in wheat area.

## **Rice**

Global rice trade is projected to grow nearly 3 percent annually from 2002 through 2011. By 2011, global trade is projected to exceed 30 million tons, more than 32 percent above the record of 26.6 million set in 1997/98. Projected trade growth is faster than in the 1980s, but slower than in the 1970s and 1990s. Rice trade as a share of total use remains very small relative to other cereals, despite a projected small increase to almost 7 percent by 2011.

International rice trade is consists predominantly of long-grain (indica) varieties, which will also account for the bulk of trade growth over the next decade. Indica rice is imported by a broad spectrum of countries in Asia, the Middle East, Sub-Saharan Africa, and Latin America. Indonesia, Iran, Iraq, and the Philippines are among the top long-grain markets.

In contrast, most japonica imports are by middle and higher income countries, primarily Japan, South Korea, Turkey, and Jordan. Expansion in medium-grain (japonica) trade is expected to be much slower, despite the increases since 1995 in medium- and short-grain rice imports by Japan and South Korea under the Uruguay Round Agreement. Japan's minimum access imports under the World Trade Organization (WTO) are scheduled to remain fixed at the 2000/01 level (682,000 tons) until another agreement is reached. South Korea's WTO minimum access imports are scheduled to continue expanding through 2004 when they reach 205,000 tons. Accession of Taiwan to the WTO would further boost global japonica imports.

Global rice production is expected to only grow slowly over the forecast period, primarily due to a slowdown in area increases. Expansion in global acreage is expected to remain extremely small, as it has since 1975, as modest area gains in South Asia, the Philippines, Thailand, and several smaller producers are partially offset by land leaving the sector in China and Brazil. Global yield growth has slowed since the early 1990s, but continues to expand modestly with varietal improvements.

Asia will account for the bulk of the growth in global rice consumption, even though per capita consumption in the region is projected to decline. Per capita rice consumption in middle and



higher income Asian countries has been declining for several decades, particularly in Japan, South Korea, and Taiwan, and is expected to continue to decline, reducing total rice consumption in these countries. Higher incomes lead to declines in rice consumption in these countries in favor of other foods, such as wheat products, fruits and vegetables, and meat. Little or no growth in per capita consumption is projected for the largest rice consuming countries in Asia. In China, the world's largest rice consuming country, per capita consumption began to decline in the 1990s and is projected to continue declining, a result of rising incomes, urbanization, and shifting diets. Even with a rising population, China's total food consumption of rice is projected to decline over the next decade. Per capita growth is projected to be negligible in India, Indonesia, and Bangladesh. However, growing populations will push total rice consumption higher over the next decade in these three major rice-consuming countries.

In contrast, per capita consumption is projected to continue rising in other regions. These are primarily lower income rice producing countries, such as the Philippines, and higher income non-Asian countries, such as Canada, the EU, and the United States. Per capita consumption is also projected to continue expanding in the Middle East, Egypt, and Central and Eastern Europe. Per capita consumption in Brazil, the largest non-Asian rice consuming country, has been declining since the 1990s and is projected to continue declining over the next decade. As a result, total rice consumption in Brazil is projected to fall despite an expanding population.

The United States is a net exporter of rice, shipping high-quality indica and japonica rice to markets worldwide. However, both U.S. rice exports and the U.S. share of global rice trade are projected to slowly decline over the next decade. Fractional growth in U.S. production, continued expansion in domestic use, and higher U.S. prices relative to Asian competitors are expected to prevent any increase in the volume of U.S. rice exports over most of the baseline period.

U.S. rice exports are projected to increase in 2003 and remain flat for the next 2 years as large U.S. stocks are slowly drawn down. However, from 2006 through the end of the baseline period, U.S. rice exports decline as strong growth in domestic consumption outpaces stagnating production. U.S. stocks are steadily drawn down and the U.S. price premium over Asian competitors widens. By 2011, total U.S. rice exports are projected at less than 2.5 million tons, while total imports are expected to rise to 440,000 tons, leaving the United States a net exporter of about 2 million tons of rice. This compares with the estimated 2.3 million tons of net exports in 2000/01.

The United States accounted for more than 20 percent of global rice trade during the 1970s and was the largest exporter several years during that decade. From 1991 to 1995, the U.S. share of the export market for rice varied from 14 percent to 17 percent, but averaged less than 12 percent from 1996 to 2001. It is projected to slowly decline to about 8 percent by 2011.

Thailand is projected to remain the world's largest rice exporter over the next decade, with exports rising from less than 7 million tons to almost 10 million by 2011. Vietnam is projected to remain the number two rice exporter, with shipments expanding from about 4 million tons to 5.7 million. China is projected to slowly expand exports over the next decade and will remain

the third largest exporter after 2002. Export growth by India and Pakistan will be much slower than for the top 3 exporters. India's internal price supports typically make it non-competitive in the global market. Pakistan has little ability to substantially expand rice production. Among smaller exporters, Australia, Argentina, and Uruguay are projected to slowly expand exports, while little or no growth is projected for Egypt and the EU.

Historically, trade in international rice markets has exhibited greater volatility than in other global cereals' markets. Much of this volatility stems from a high concentration of global rice production in South and Southeast Asia where much of the production is heavily dependent on the timing and amount of rainfall during the monsoon season. In addition, only a small share (currently about 6 percent) of world rice production is traded each year. These factors will continue to affect the world rice market during the next 10 years, with the potential to create dramatic annual swings in trade that could deviate significantly from the trends projected in this baseline.

### **Cotton**

World cotton trade is expected to average 1.3-percent annual growth during 2002-2011, reversing much of the decline suffered during the 1990s. World cotton trade fell from a peak of 33.4 million bales in 1988 to 23.7 million in 1998, in large part due to declining Russian imports. China also switched from a large importer to exporter in 1998. The outlook is for import growth in Russia, China, and elsewhere during the forecast period and world exports are projected to reach 33 million bales by 2011.

The United States is expected to remain the world's leading exporter of cotton with exports in the 10 to 11 million bales range throughout the projection period. U.S. cotton exports are projected to benefit from the Multi-Fiber Arrangement phaseout after 2004 and the subsequent expected increase in raw cotton consumption by developing countries. However, as a share of world trade, U.S. exports peak in 2003 at 37 percent, then decline gradually to about 30 percent by 2011. This is still well above its average share of global trade during the 1990s.

Foreign export growth is expected to recover during 2002-2011, but to remain below the long-term trend. By 2011, foreign exports are expected to total 23.1 million bales. Foreign export growth will be supported by some resumption of trade relations among countries of the FSU, and by growing import demand from China, Latin America, and Southeast Asia. Growth in foreign consumption and production of cotton both slowed substantially during the 1990s, largely due to difficulties with the transition to market economies in the FSU and CEE regions. Recovery became evident late in the 1990s and is expected to continue during the next decade. Rebounding Russian mill consumption since 1999 and the likelihood that China will again become an importer following cotton-sector policy reforms underlie much of the expected growth in world cotton trade during the next 10 years.

In addition to Russia's return to growth, several countries that were net suppliers to world markets as late as 1990 have become importers instead. In past years, increasing consumption in Mexico, Brazil, and Turkey in part represented shifts in consumption away from importing countries to non-importing producers. As consumption gains have consistently outpaced

production in all three countries, they have begun to steadily import, driving world trade higher. Even India and Pakistan became frequent net importers during the second half of the 1990s.

However, a key uncertainty is the extent to which earlier gains in cotton consumption, associated with a shift in consumer fiber preference toward cotton and away from synthetics, can be sustained. Cotton competes with manmade fibers (e.g., polyester, nylon, and olefin), as well as wool, linen, and silk in the production of textiles. Sustained Asian investment in polyester capacity suggests vigorous competition for fiber share in coming years. The WTO-mandated end of textile import quotas starting in 2005 also has the potential to significantly transform the global textile industry for all fibers, adding further uncertainty to the outlook.

**Highlights for Major Foreign Cotton Importers.** The principal use for raw cotton fiber (lint) is the production of textiles which, in turn, are used to produce apparel, home furnishings, and industrial products. In traditional cotton-importing countries (e.g., Japan, South Korea, Taiwan, and the European Union), cotton consumption is expected to decline steadily. Production disadvantages in the textile sectors of traditional importers will accelerate declines in their raw cotton consumption early in the projection period in the face of strong competition from emerging Asian textile suppliers. However, the EU is expected to remain the world's largest importer of cotton through 2008.

China's consumption is expected to outpace production during 2002-2011, and positive net imports are forecast to resume now that stocks have fallen. China is expected to overtake the EU as the world's largest importer during the projection period. Cotton production in China has been hampered by competition from other crops and by growing pesticide resistance by major cotton pests, although recently yield growth has resumed. Further losses are not expected, although production prospects in China, the world's largest cotton producer, are uncertain following extensive policy reforms for cotton since 1999.

The North China Plain rebounded as a production region during 2000 and 2001, following chronic bollworm infestations during the early 1990s. However, it remains far short of its former role as China's pre-eminent growing region. The Yangtze region's cotton area was much more stable than the North China Plain's during the 1990s, however, it has declined in importance relative to Xinjiang in the far West. China's total area devoted to cotton is expected to remain well below the peaks seen in 1984 and 1992. China's yield growth recovered during the 1990s, but the termination of a government price floor suggests the incentives for maintaining input levels may be smaller during the forecast period. However, the widespread adoption of Bt cotton in eastern China suggests that fewer inputs may be required.

China's future production and consumption prospects are both subject to considerable uncertainty. Since China is often one of the world's largest importers over some of the projection period, differing assumptions on supply and use developments could significantly influence world trade and U.S. exports. During the course of recent policy reforms, China's cotton prices and farmer enthusiasm have varied widely from year-to-year, and it is unclear where China's privatization of cotton marketing will take it. Specific areas of uncertainty include the extent to which planted area might return to cotton production after a 5-year, 1.2-

### Effects of the Multi-Fiber Arrangement Phaseout in 2005

International trade in textiles and apparel has been governed by quantitative restrictions under the Multi-Fiber Arrangement (MFA) and earlier agreements for more than 30 years. In addition, developing countries have maintained severe border restrictions independent of international trade agreements. One of the major results of the WTO's Uruguay Round was the conclusion of the Agreement on Textiles and Clothing (ATC), which provides for the dismantling of these restrictions. Under the Uruguay Round ATC, the MFA restrictions are to be phased out over a 10-year period ending at midnight on December 31, 2004.

The ATC provides the legal framework leading to a complete integration of the textile sector into the General Agreement on Tariffs and Trade (GATT) at the end of the transition period. The MFA phaseout is comprised of two parts: a four-stage process eliminating import restraints contained in bilateral agreements previously negotiated on products covered under the MFA, and an increase in quota growth rates for products still under restriction during the transition period. The ATC also deals with other non-MFA restraint measures relating to textiles and clothing.

With the elimination of the MFA quotas and other restrictions, tariffs will become the primary mechanism for border protection as the same rules will apply to trade in textiles and clothing as in other non-agricultural goods. In the long run, the restraint reductions will effectively improve market access for developing countries' textile and clothing products in developed countries. And at the same time, developed countries are already achieving the reciprocal access to developing countries' textile and apparel markets that was lacking before the Uruguay Round Agreement (Hamrick, et al.; 2000).

To account for the MFA phaseout, the process of converting raw cotton fiber into apparel was broken into two steps.

- **Textile production:** The fiber must be spun into thread or yarn, then woven into fabric. Both functions are relatively capital-intensive.
- **Apparel production:** The textiles are cut and sewn into clothing, home furnishings, etc. Apparel production is labor-intensive.

Market-oriented trade reform is expected to speed the transfer of production to countries where resource endowments and technology result in the most efficient—i.e., lowest cost—production. In the case of apparel production, labor is the decisive input factor. Textile production often

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million-hectare decline, the extent to which cotton consumption can maintain its initial post-reform surge, and the evolution of agricultural trade policy as China's reforms continue.

In Indonesia and Turkey, consumption and import expansion are expected to resume due to comparatively cheap labor, favorable exchange rates, and foreign investment in their textile

### Effects of the Multi-Fiber Arrangement Phaseout in 2005--continued

occurs alongside of apparel production, although it need not since capital and technology are the critical inputs. Capital and technology are significantly more mobile than labor, although certain conditions may restrict their mobility in international markets. As a result, the MFA phaseout may affect a country's textile and apparel sectors to different degrees depending on labor, capital, and technology (MacDonald, et al., 2001).

To project the effects of the MFA phaseout, all countries were classified into three separate groupings based principally on their labor markets.

**Low-cost labor markets** are defined as countries with per capita income at or below that of China. In this group of countries, better access to cheap labor under the MFA phaseout raises demand for textiles by the apparel industry to such an extent that the textile industry also benefits despite being high-cost capital markets. As a result, cotton demand for these countries accelerates slightly upward starting in 2005. This translates into greater import demand for cotton based on each country's domestic production capacity and responsiveness.

**Medium-cost labor markets** are represented by a set of middle-income countries—e.g., Thailand, South Korea, and Taiwan. In this group of countries, apparel production becomes less competitive without the aid of border protection. Losses in the apparel industry offset gains in the textile industry. As a result, cotton demand is neutral to the MFA phaseout, but grows or declines at whatever rate existed in the absence of the MFA phaseout.

**High-cost labor markets** are represented by higher-income countries—e.g., U.S., EU, Australia, and Japan, as well as Mexico and Turkey. In this group of countries, losses in the apparel industry spill over into the textile industry, thereby reducing cotton demand starting in 2005 from whatever rate existed in the absence of the MFA phaseout.

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industries. Indonesia is expected to be the third largest importer in the world throughout much of the forecast period, and Turkey is expected to be the fourth largest. Turkey is expected to benefit from continued integration into the EU. Turkey's cotton production is expected to continue to rise, particularly in Southeast Anatolia.

The largest expected increase in cotton import volume during 2002 to 2011 (after China) is forecast for Bangladesh. Currently, garments account for around 80 percent of Bangladesh's exports, and much of these garments are produced from imported textiles. Bangladesh's per capita income is currently among the lowest in Asia, even on a purchasing-power-parity basis, implying a very low-wage labor pool. As a result, it is likely to be an increasingly important garment exporter during the forecast period. However, Bangladesh also began developing a spinning industry during the 1990s, and cotton imports during 1993-2001 grew 12 percent annually. The growth rate is expected to slow to 6 percent during the forecast period, second only to China in percentage as well as volume terms.

After years of plummeting cotton consumption, some FSU countries are beginning to increase consumption again, while CEE consumption in aggregate continues to lag. For even the most dynamic of the region's traditional importers, cotton consumption and imports are expected to remain well below historic levels throughout 2002-2011. However, Central Asian countries, like Uzbekistan, are likely to consume more cotton than in the past as government policies favor investment in local textile industries.

**Highlights for Major Foreign Cotton Exporters.** Australia and the French-speaking countries of West Africa will continue to channel most of their growing cotton output into the export market throughout the forecast period. There is little prospect of either exporter processing a significant amount of its cotton output domestically, although in the very long run a larger textile industry is likely to develop in Africa.

The Central Asian countries of the FSU will continue exporting cotton to non-FSU markets at higher levels than during the 1980s. These countries are also expected to increase their exports within the FSU. Central Asia's ability to export, however, will be heavily dependent on yield gains. Past environmental damage due to high levels of input use and poor water management have rendered useless much of the area abandoned in Central Asia during the 1990s, and this area is expected to remain out of production during the projection period. In addition, efforts to diversify agricultural production will sustain area for grains and other crops at the expense of cotton. Uzbekistan and Turkmenistan have also consumed growing quantities of cotton in recent years and are likely to continue to maintain policies that favor textile investment for much of the forecast period. This will be a further constraint on their raw cotton exports.

Supply prospects in Central Asia, currently the source of nearly one-quarter of world cotton exports, are an important uncertainty in the global outlook. Economic and agricultural reform has been slow in the region's major producers, so reform's long run impacts on yield growth and cross-commodity competition remain conjectural. According to the World Bank, the region's largest exporter, Uzbekistan, is pursuing policies that tax agriculture substantially in order to promote industrialization. Under these circumstances, Central Asia's exports are expected to grow more slowly than the rest of the world, and the region's share of world trade falls to 15 percent by 2011.

## **Soybeans and Products**

World trade in both total oilseeds and soybeans is projected to increase faster during 2002-2011 than during the 1980s, but much more slowly than in the early 1990s. Global exports of soybeans and soybean meal are projected to rise at annual rates of 3.4 and 2.3 percent over the projection period, reaching 78 and 53.5 million tons, respectively, by 2011. Combined exports of soybeans and meal, on a soybean-equivalent basis, are projected to grow from 109.7 million tons in 2001 to 145.3 million tons by 2010.

World soybean oil trade is projected to grow 3.3 percent annually during 2002-2011, compared with 5-percent growth achieved in the 1980s and 1990s. Although both world and U.S. exports of soybean oil are projected to grow faster than soybean exports during 2002-2011, they are not expected to keep pace with trade in other vegetable oils. With the outlook for continued trade growth in oils relative to meals, incentives to produce high-oil content oilseeds and palm oil are expected to strengthen.

**Soybeans and Soybean Meal.** Projections of U.S. exports of soybeans and soybean meal are 30.5 million tons and 7.8 million tons, respectively, by 2011. The U.S. share of world soybean exports is projected to drop to 39 percent by 2011, reflecting strong competition. The U.S. market share of soybean meal trade is seen edging up to 16 percent by 2003, but by 2011 contracts to less than 15 percent again as foreign supplies expand. These projected U.S. market shares contrast with significantly higher trade shares for soybeans (73 percent) and soybean meal (24 percent) achieved in the 1980s, when U.S. production was a greater proportion of the world total. Limited expansion of U.S. acreage and slowing crush rates eventually constrict exportable supplies of soybeans and soybean meal. Another factor slowing U.S. soybean exports in the longer term is thriving exports of meat, especially poultry. This trend will boost the livestock population and boost the share of protein feed supplies consumed within U.S. borders compared with past years.

South American producers, particularly Argentina and Brazil, are expected to continue to expand their supplies of soybeans and products to international markets. In Brazil, steadily expanding domestic meal consumption and exports will support crush demand. However, for several years, Brazilian soybean exports are likely to moderate because of larger U.S. exports and tighter domestic supplies. Near the end of the baseline period, Brazil's soybean exports are expected to exceed U.S. exports. Argentina's small consumption base and substantial crush capacity assure long term growth in exports of soybean meal, but limits on soybean area should slow growth of soybean production and exports.

A projected decline in EU imports of soybeans and soybean meal is expected to contribute to slower growth in world soybean meal consumption over the projection period compared with the high 4.6-percent rate of the 1990s. The EU is traditionally the world's major source of import demand for soybeans and soybean meal. From 1996 through 2001, the EU accounted for over 42 percent of all imports of soybeans and soybean meal. EU market share is projected to decline to about 30 percent by 2011. Abundant EU grain stocks and lower internal grain prices (due to Agenda 2000 reforms) combine to reduce the relative cost of feeding grains versus soybean

meal. As a result, increases in grain feeding are expected to trim EU soybean meal consumption, as well as imports of soybeans and soybean meal.

However, offsetting much of the decline in EU demand is increasing East Asian protein meal consumption in the next few years, reflecting comparatively strong economies in China and other Asian countries. But China's policy maximizing domestic crushing capacity instead of importing protein meal and vegetable oil significantly influences the composition of world trade. China is expected to account for 80 percent of the world's growth in soybean imports over the next 10 years. With relatively small soybean meal imports by China, competition among the major soybean meal exporters is likely to intensify early in the projection period. For other soybean importing countries, favorable import prices for meal relative to soybeans are likely to pressure crush margins, and curtail their soybean imports in favor of the products. However, in the case of Mexico, low U.S. soybean prices are expected to continue to encourage steady imports.

**Soybean Oil.** Growth in soybean oil trade is projected to slow to 3.3 percent during 2002-2011, compared with about 8 percent in the 1990s when developing countries made sharp import gains. Strong consumption gains are again projected for the developing nations of Asia and Latin America, but will be partially offset by slower growth anticipated for Europe, the former Soviet Union, Japan, and the United States. India is expected to remain a large importer of soybean oil, but growth will be flat. In China, rising vegetable oil output should limit growth in its soybean oil imports. Furthermore, strong competition from other vegetable oils, particularly Southeast Asian palm oil, is expected to shift some demand away from soybean oil.

Growth in soybean processing in China, Brazil, and Argentina accounts for most of the projected gains in foreign soybean oil production. The U.S. share of global soybean oil exports is projected to edge up to 13.4 percent in 2002. But slower growth in domestic soybean oil production, greater South American competition, and global output gains for other vegetable oils should eventually pare the U.S. market share back to less than 11 percent, or about 1.3 million tons, by 2011.

## **Beef**

World beef production and consumption are projected to show strong growth over the projection period. Some of the largest increases in production are expected to be in China, Mexico, Canada, and countries of the former Soviet Union. Argentina and Brazil have significant production potential, but foot-and-mouth disease (FMD) prevalence is expected to limit market opportunities and slow expansion. Global beef consumption increases are based on a return to strong GDP growth in most consuming countries. The majority of the increase in beef consumption is expected to be in Asia with the largest increases in China. However, Chinese trade policies are expected to favor domestic beef production and little increase in imports is expected. Mexico and Russia are also expected to show large increases in imports. Most of Russia's imports will be supplied by European countries and former members of the Soviet Union. The major Asian markets—South Korea, Japan, Taiwan, and Philippines—are all expected to grow steadily through the projection.



The United States will supply an increased share of world beef exports over the projection period. U.S. export volume is expected to increase by 39 percent over the period, compared with a 23-percent increase in exports by the nine other major beef exporters. As a result, the U.S. share of beef exports among major exporters will increase from about 19.5 percent to nearly 22 percent. Over 90 percent of the increase in U.S. beef exports are destined for its traditional markets of Japan, Korea, Mexico, Canada, and the Caribbean Islands. Most of the remainder will be shipped to the relatively small but fast growing fed-beef markets of Taiwan, the Philippines, and, to some extent, Egypt and Saudi Arabia.

The increased U.S. share of world beef trade is mainly the result of limited increases in supply from traditional competitors. Beef exports from New Zealand and Canada are expected to increase by about 22 percent and 35 percent, respectively, or less than the increase by the United States. Australian beef exports are expected to decline through the middle of the decade as that country rebuilds its herd. As a result, increased U.S. market share is expected to be especially significant in Asian markets where competition with Australia is the strongest.

Several smaller grass-fed beef suppliers, whose products do not compete with U.S. beef, are expected to increase exports by greater percentages than the United States. Ukrainian exports rebound by 75 percent from their reduced level following Ukraine's financial crises in the 1990s, but do not reach historical levels. Nearly all Ukraine's increased exports are marketed in Russia. Exports from Argentina declined sharply in 2001 because of bans following the discovery of foot-and-mouth disease. Longer term, exports from Argentina more than double over the projection period to exceed the levels of the past three years, but they do not reach record historical levels of the 1960s and 1970s. Exports from the EU increase over the next few years as concerns about BSE diminish, to again reach the WTO-maximum (817,000 tons).

Among traditional U.S. markets, the fastest growing is Mexico, which is expected to nearly double imports. Demand for U.S. beef in Mexico is supported by the close economic and geographic links between the Mexican and U.S. economies, continued strong growth in the United States, and tariff elimination under NAFTA.

## **Pork**

World pork production and consumption are both expected to increase over the projection period based on expected higher producer returns and solid global GDP growth. Favorable resource bases create the potential for significant growth in the pork sectors of Brazil and Mexico. Factors that will determine the extent of growth of Brazilian and Mexican exports include macroeconomic stability and rates of improvement in infrastructure.

Brazil's projected rapid production growth through 2011 is the fastest among major exporters, but strong domestic consumption growth is expected to limit trade gains. However, Brazil is expected to improve its competitiveness in international markets, and begin to make headway into lower-priced markets. China, Mexico, and Canada also experience strong production growth during the baseline period. But strong domestic demand in both China and Mexico is expected to maintain their status as net pork importers through 2011.

Strong consumption growth is expected in Asia, particularly China. Sustained import growth also occurs in much of the rest of Asia as population and incomes increase, and as noncompetitive domestic production sectors decline.

Consumption in mature pork markets (the United States, the EU, Canada, and Japan) is expected to grow with population and income over the baseline period. In the EU (the world's leading pork exporter), exports are projected flat as domestic production gains barely keep pace with modest increases in use. In contrast, U.S. exports grow over 2 percent per year as production gains are projected to edge above only limited increases in domestic use. Canada, a low-cost producer whose export growth is particularly pronounced early in the projection period, is expected to contest for market share in Asian markets heretofore dominated by the United States and the EU.

## **Poultry**

During the 2002-2011 forecast period, poultry meat production and consumption are forecast to grow rapidly, due primarily to cost advantages relative to both beef and pork. Worldwide trade in poultry products is also expected to increase, with about 3 percent annual growth for major exporters. Producers in major exporting countries will be faced with trying to find the most profitable markets for a wide variety of poultry products.

Projected gains in poultry meat consumption are due to a number of economic and social changes in both developed and developing countries. Over the forecast period, consumption in developed countries is expected to continue to move more heavily towards partially or fully prepared meals, due to time constraints on food preparation. For consumers in developing countries, growth in poultry consumption will be tied closely to increases in per capita disposable income and the influences of changing dietary habits and food consumption patterns. As populations in many developing countries become more urbanized, a larger share of total food expenditures is expected to be away from home. In this situation, higher poultry consumption will come from greater use of poultry parts rather than whole birds. The focus of worldwide poultry trade will be on moving poultry parts to those markets where the populations have a preference for them or markets that are seeking low-cost meat products.

Worldwide poultry production in the forecast period is expected to undergo further consolidation and integration in both the production and processing sectors. Much of this type of consolidation has already occurred in developed countries, but in many developing countries, poultry production and processing are still undergoing a shift from small local producers or subsistence production to larger operations directly tied to centralized processing facilities. The pace at which this changeover occurs in developing countries will depend on a number of factors, including the rate of income growth, the degree and speed of urbanization, the price of poultry relative to beef and pork, and the development of food marketing and transportation systems able to distribute a wide variety of processed products.

Most of the increases in poultry consumption during the forecast period is expected to come from Asian and Eastern European countries (including Russia). China is expected to be the largest source of growth in poultry consumption in Asia. The Chinese government has supported

increased poultry production as a more efficient use of feed grain supplies than pork production. Although China's poultry production and exports are both expected to increase, China is expected to remain a net importer of poultry due to rising incomes and changing eating patterns. Other major growth markets for poultry consumption are expected to be Eastern Europe and Russia. In these areas, the majority of growth in poultry consumption will come from higher imports. Domestic poultry production in Russia is expected to increase only gradually. While Eastern European and Russian poultry importers have relied on U.S. products in the past, this is a price sensitive market that is expected to see greater competition in the future, especially from Brazilian poultry exports.

Trade in poultry parts and prepared products is expected to increase during the baseline period as processors in the major exporting countries seek to identify other markets where specific poultry parts are preferred by consumers and can obtain a higher price. The basis of this increase in trade is a shift in consumption from whole birds to parts. The U.S. poultry sector is based on the domestic consumption of white meat poultry products and the export of less desirable (by U.S. standards) dark meat products to other countries. However, in other exporting countries where a preference for dark meat predominates, there could be a reversed marketing pattern where white meat is the exported product.

The expectation of higher levels of poultry trade over the forecast period hinges on a continued drop in the levels of trade restrictions. These restrictions can take the form of product quotas, import tariffs, or sanitary restrictions of some kind. While multilateral trade agreements have lessened trade restrictions to some degree, over the baseline period the poultry industry will have to address conflicts regarding growing conditions, disease restrictions, slaughtering methods, processing conditions, and other issues such as labeling and record keeping requirements.

Table 36. Coarse grains trade baseline projections

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
<i>Imports, million metric tons</i>												
Importers												
Former Soviet Union <sup>1</sup>	1.1	1.4	1.5	1.6	1.7	1.8	1.9	2.1	2.2	2.4	2.5	2.7
Eastern Europe	2.9	1.4	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.6	1.6
Japan	19.9	19.6	19.6	19.5	19.4	19.3	19.3	19.2	19.1	19.0	18.9	18.8
South Korea	8.7	7.3	7.3	7.2	7.3	7.4	7.5	7.6	7.8	7.9	8.1	8.3
Taiwan	5.1	5.1	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.4	5.4	5.4
China	2.4	2.8	3.4	4.0	4.3	5.3	6.1	6.8	8.1	8.9	9.7	11.2
Mexico	10.4	10.8	10.9	11.1	11.3	11.5	11.7	12.0	12.4	12.5	12.9	13.1
European Union <sup>2</sup>	3.1	3.2	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Latin America <sup>3</sup>	10.5	10.5	10.6	11.2	11.4	11.7	12.0	12.4	12.8	13.2	13.5	13.9
North Africa & Middle East	23.9	24.5	24.9	25.6	26.4	27.3	28.0	29.0	29.9	30.9	31.7	32.8
Other Asia & Oceania	5.7	5.9	5.5	5.6	5.8	6.0	6.2	6.5	6.8	6.9	7.0	7.3
Sub-Saharan Africa <sup>4</sup>	1.6	1.6	1.7	1.7	1.8	1.8	1.8	1.9	2.0	2.0	2.0	2.1
Other foreign <sup>5</sup>	6.2	5.6	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.5	3.5	3.6
United States	2.7	2.5	2.9	3.0	3.0	3.1	3.1	3.2	3.2	3.2	3.2	3.3
Total trade	104.1	101.9	100.7	102.9	104.9	107.8	110.3	113.4	117.0	120.1	122.8	126.7
<i>Exports, million metric tons</i>												
Exporters												
European Union <sup>2</sup>	10.1	8.2	9.2	10.1	10.8	11.8	12.0	12.0	12.1	12.2	12.3	12.4
China	7.0	4.0	3.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0
Argentina	11.4	11.4	12.5	13.2	13.6	14.1	14.3	14.7	15.1	15.7	15.9	16.6
Australia	4.4	4.5	4.3	4.3	4.2	4.2	4.2	4.3	4.3	4.3	4.4	4.4
Canada	3.6	2.5	3.9	3.8	3.4	3.4	3.5	3.6	3.6	3.8	3.9	4.1
Republic of South Africa	0.9	1.5	1.2	1.4	1.6	1.7	1.9	2.0	2.1	2.3	2.4	2.7
Eastern Europe	1.3	3.4	3.1	3.6	4.0	4.2	4.6	4.9	5.1	5.7	6.1	6.7
Former Soviet Union <sup>1</sup>	2.4	4.6	4.0	4.2	4.3	4.2	4.5	4.8	5.1	5.4	5.8	6.3
Other foreign	0.0	3.0	2.8	3.0	2.7	2.6	2.6	2.5	2.5	2.5	2.5	2.8
United States	56.7	58.9	55.9	56.6	58.0	59.2	60.6	62.7	65.3	66.7	68.2	69.6
<i>Percent</i>												
U.S. trade share	54.4	57.8	55.5	55.0	55.2	54.9	55.0	55.2	55.8	55.6	55.6	55.0

1/ Includes intra-FSU trade.

2/ Excludes intra-EU trade, covers EU-15.

3/ Excludes Mexico.

4/ Includes Republic of South Africa.

5/ Includes unaccounted.

The projections were completed in October 2001 based on policy decisions and other information known at that time.

Table 37. Corn trade baseline projections

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
<i>Imports, million metric tons</i>												
Importers												
European Union <sup>1</sup>	2.6	2.6	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Former Soviet Union <sup>2</sup>	0.3	0.4	0.6	0.6	0.7	0.8	0.8	0.9	1.0	1.1	1.1	1.2
Egypt	5.0	5.1	5.1	5.1	5.4	5.7	6.0	6.4	6.8	7.2	7.5	7.9
Other N. Africa & Middle East	9.7	9.8	9.5	9.7	10.0	10.3	10.5	11.0	11.3	11.8	12.0	12.5
Japan	16.0	15.7	15.6	15.5	15.5	15.4	15.3	15.3	15.2	15.2	15.0	15.0
South Korea	8.5	7.0	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9
Taiwan	4.8	4.8	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.1	5.1	5.2
China	0.1	0.2	0.8	1.3	1.6	2.5	3.2	3.8	5.0	5.7	6.5	7.8
Indonesia	1.3	1.5	1.5	1.5	1.6	1.8	1.9	2.0	2.1	2.1	2.2	2.2
Malaysia	2.4	2.5	2.5	2.6	2.6	2.7	2.8	2.8	2.9	3.0	3.1	3.1
Other Asia & Oceania	3.2	3.3	3.0	2.9	3.0	3.2	3.4	3.6	3.7	3.8	3.8	4.0
Mexico	5.5	6.0	6.2	6.2	6.3	6.4	6.5	6.6	6.8	6.9	7.0	7.0
Central America & Caribbean	3.5	3.7	3.3	3.4	3.5	3.6	3.7	3.9	4.0	4.1	4.2	4.3
Brazil	0.3	0.5	0.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Other South America	5.7	5.8	5.9	6.1	6.3	6.5	6.7	6.9	7.1	7.3	7.6	7.8
Sub-Saharan Africa <sup>3</sup>	1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8
Other foreign <sup>4</sup>	5.2	3.7	1.0	1.1	1.0	0.9	0.8	0.8	0.7	0.8	0.8	0.8
United States	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total trade	75.5	74.2	71.6	73.2	74.9	77.1	79.1	81.6	84.5	87.0	88.9	92.1
<i>Exports, million metric tons</i>												
Exporters												
European Union <sup>1</sup>	0.2	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
China	7.0	4.0	3.8	2.6	2.4	2.2	2.0	1.8	1.6	1.4	1.2	1.0
Argentina	10.5	10.7	11.7	12.5	12.8	13.3	13.6	14.0	14.3	14.9	15.2	15.9
Brazil	4.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1
Republic of South Africa	0.9	1.5	1.2	1.4	1.6	1.7	1.9	2.0	2.1	2.3	2.4	2.7
Eastern Europe	0.9	2.5	2.6	3.3	3.6	3.9	4.2	4.5	4.7	5.2	5.5	6.1
Former Soviet Union <sup>2</sup>	0.2	0.2	0.5	0.7	0.7	0.9	1.0	1.0	1.1	1.1	1.2	1.4
Other foreign	1.5	1.5	1.5	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.9
United States	49.3	52.1	48.9	49.5	50.8	52.1	53.3	55.2	57.8	59.1	60.3	61.6
<i>Percent</i>												
U.S. trade share	65.2	70.2	68.3	67.7	67.8	67.6	67.4	67.7	68.4	67.9	67.8	66.9

1/ Excludes intra-EU trade, covers EU-15.

2/ Includes intra-FSU trade.

3/ Includes Republic of South Africa.

4/ Includes unaccounted.

The projections were completed in October 2001 based on policy decisions and other information known at that time.

Table 38. Sorghum trade baseline projections

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
<i>Imports, million metric tons</i>												
Importers												
Japan	2.0	1.9	2.0	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Mexico	4.7	4.5	4.5	4.5	4.7	4.7	4.8	4.9	5.2	5.2	5.4	5.5
North Africa & Middle East	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
South America	0.6	0.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Sub-Saharan Africa	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Taiwan	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other <sup>1</sup>	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Total trade	8.3	7.4	7.9	7.8	7.9	8.0	8.0	8.1	8.4	8.4	8.5	8.7
<i>Exports, million metric tons</i>												
Exporters												
Argentina	0.7	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.7	0.6	0.5	0.5
Australia	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Other foreign	0.9	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
United States	6.1	6.1	6.4	6.4	6.5	6.5	6.6	6.7	6.9	7.0	7.2	7.4
<i>Percent</i>												
U.S. trade share	73.4	81.9	80.6	81.3	81.6	81.2	82.3	82.7	82.0	83.3	84.7	85.1

1/ Includes unaccounted.

The projections were completed in October 2001 based on policy decisions and other information known at that time.

Table 39. Barley trade baseline projections

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
<i>Imports, million metric tons</i>												
Importers												
Former Soviet Union <sup>1</sup>	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	1.0
Japan	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
South Korea	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Taiwan	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
China	2.3	2.5	2.6	2.6	2.7	2.7	2.8	2.9	3.0	3.1	3.2	3.3
European Union <sup>2</sup>	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Latin America <sup>3</sup>	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.9
Algeria	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
Saudi Arabia	4.0	5.0	5.3	5.5	5.5	5.7	5.7	5.8	5.9	5.9	6.0	6.1
Morocco	0.6	0.7	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6
Tunisia	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7
Iran	0.9	0.7	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.1
Iraq	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Turkey	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
Other N. Africa & M. East	2.3	1.8	2.4	2.5	2.5	2.6	2.6	2.7	2.7	2.8	2.8	2.9
Other foreign <sup>4</sup>	1.6	1.1	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4
United States	0.6	0.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total trade	16.6	16.8	17.8	18.4	18.6	19.2	19.4	19.7	20.1	20.5	20.9	21.4
<i>Exports, million metric tons</i>												
Exporters												
European Union <sup>2</sup>	8.0	6.0	7.5	8.4	9.1	10.1	10.3	10.3	10.4	10.5	10.6	10.7
Australia	3.6	3.7	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.7	3.7	3.7
Canada	2.0	1.0	1.9	1.8	1.4	1.4	1.4	1.4	1.4	1.5	1.6	1.6
Former Soviet Union <sup>1</sup>	2.0	4.1	3.2	3.2	3.2	2.8	2.9	3.1	3.3	3.5	3.6	3.9
Eastern Europe	0.4	0.8	0.5	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
Turkey	0.2	0.2	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Other foreign	0.2	0.4	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
United States	1.3	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
<i>Percent</i>												
U.S. trade share	7.6	3.9	3.7	3.5	3.5	3.4	3.4	3.3	3.2	3.2	3.1	3.1

1/ Includes intra-FSU trade.

2/ Excludes intra-EU trade, covers EU-15.

3/ Includes Mexico.

4/ Includes unaccounted.

The projections were completed in October 2001 based on policy decisions and other information known at that time.

Table 40. Wheat trade baseline projections

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
<i>Imports, million metric tons</i>												
Importers												
Algeria	5.0	5.0	4.4	4.5	4.6	4.6	4.6	4.7	4.8	4.8	4.9	4.9
Egypt	5.8	5.8	5.9	5.9	6.0	6.0	6.1	6.1	6.2	6.2	6.3	6.3
Morocco	3.3	3.0	2.6	2.6	2.6	2.7	2.7	2.7	2.7	2.8	2.8	2.8
Iran	6.5	6.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	6.0
Turkey	0.5	1.2	0.7	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.0
Other N. Africa & Middle East	12.8	13.0	13.2	13.4	13.6	13.9	14.1	14.3	14.5	14.8	15.0	15.2
Sub-Saharan Africa <sup>1</sup>	8.2	8.4	8.5	8.7	8.7	8.8	9.0	9.1	9.3	9.4	9.5	9.6
Mexico	3.1	3.4	3.4	3.6	3.7	3.7	3.8	3.9	4.0	4.0	4.1	4.2
Central America & Caribbean	3.3	3.4	3.4	3.5	3.5	3.6	3.6	3.7	3.7	3.8	3.8	3.8
Brazil	7.2	6.5	7.3	7.3	7.7	8.0	8.3	8.5	8.8	9.1	9.4	9.7
Other South America	5.7	5.7	5.8	5.8	5.9	6.0	6.0	6.1	6.1	6.1	6.2	6.2
Former Soviet Union <sup>2</sup>	5.7	5.3	5.6	6.0	6.2	6.5	6.8	7.0	7.2	7.4	7.6	7.8
Japan	5.9	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.7	5.7
South Korea	3.1	4.3	3.9	3.9	3.9	3.8	3.8	3.8	3.8	3.7	3.7	3.7
Indonesia	4.0	4.2	4.3	4.3	4.5	4.6	4.8	4.9	5.1	5.2	5.3	5.4
China	0.3	1.0	2.3	3.6	4.6	5.1	6.0	6.8	7.4	8.0	8.7	9.1
Pakistan	0.2	0.5	1.1	1.3	1.7	2.1	2.4	2.7	3.0	3.2	3.5	3.7
Other Asia & Oceania	11.8	12.4	12.6	13.0	13.3	13.6	13.9	14.2	14.5	14.8	15.1	15.4
Other	11.4	11.3	11.3	11.3	11.5	11.8	12.0	12.1	12.2	12.3	12.6	12.7
Total trade	103.7	106.7	106.5	110.1	113.6	116.5	119.9	122.7	125.5	128.1	131.0	133.2
<i>Exports, million metric tons</i>												
Exporters												
European Union <sup>3</sup>	15.0	12.0	15.4	16.9	17.3	18.5	21.2	22.1	23.5	25.1	27.1	28.0
Canada	17.3	15.5	17.0	18.0	18.1	18.1	18.2	18.2	18.3	18.3	18.4	18.4
Australia	16.0	16.0	15.6	16.3	17.2	17.3	17.3	17.4	17.4	17.5	17.5	17.6
Argentina	11.7	13.0	12.7	13.7	14.5	14.4	14.2	14.2	14.1	14.1	14.0	14.0
Former Soviet Union <sup>2</sup>	4.7	9.8	9.1	8.9	8.9	9.3	9.4	9.7	9.9	10.0	10.2	10.5
Eastern Europe	2.5	4.7	3.9	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
India	1.6	3.0	3.0	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.5
Other foreign	5.5	4.8	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	4.0
United States	28.9	27.9	25.9	26.5	27.9	29.3	29.9	31.3	32.7	33.3	34.0	34.7
<i>Percent</i>												
U.S. trade share	27.9	26.1	24.3	24.1	24.6	25.1	25.0	25.5	26.0	26.0	26.0	26.1

1/ Includes Republic of South Africa.

2/ Includes intra-FSU trade.

3/ Excludes intra-EU trade, covers EU-15.

The projections were completed in October 2001 based on policy decisions and other information known at that time.

Table 41. Rice trade baseline projections

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
<i>Imports, million metric tons</i>												
Importers												
Canada	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Mexico	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
Central America/Caribbean	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.6
Brazil	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.3
Other South America	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.9	0.9	1.0
European Union <sup>1</sup>	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Former Soviet Union <sup>2</sup>	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8
Other Europe <sup>3</sup>	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
China	0.3	0.3	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.9	0.9
Japan	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
South Korea	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Indonesia	1.3	1.6	3.2	3.3	3.4	3.5	3.6	3.6	3.6	3.6	3.5	3.5
Malaysia	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Philippines	1.1	0.6	0.5	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7
Other Asia & Oceania	2.5	2.4	2.1	2.2	2.2	2.2	2.3	2.3	2.3	2.4	2.4	2.4
Iraq	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.4
Iran	1.0	1.3	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.9	1.9	2.0
Saudia Arabia	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3
Turkey	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Other N. Africa & M. East	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.4	1.4
Sub-Saharan Africa	4.6	4.4	4.4	4.5	4.7	4.9	5.0	5.2	5.3	5.5	5.6	5.8
Republic of South Africa	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Unaccounted	1.2	1.4	1.6	1.5	1.7	1.9	1.9	1.8	1.9	1.8	2.0	2.0
United States	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Total imports	22.2	22.2	24.4	25.0	25.8	26.7	27.3	27.8	28.4	29.0	29.6	30.2
<i>Exports, million metric tons</i>												
Exporters												
Australia	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9
Argentina	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Other South America	1.1	1.0	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.6
European Union <sup>1</sup>	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
China	1.8	2.0	3.1	2.9	3.2	3.4	3.5	3.6	3.7	3.8	4.0	4.1
India	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1
Pakistan	2.3	2.0	1.8	1.8	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1
Burma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thailand	6.7	6.7	7.2	7.7	7.9	8.2	8.5	8.8	9.0	9.3	9.6	9.8
Vietnam	3.8	4.2	4.4	4.7	4.9	5.1	5.2	5.3	5.5	5.6	5.7	5.7
Other foreign	1.8	1.3	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6
United States	2.6	2.7	2.8	2.8	2.8	2.7	2.7	2.7	2.6	2.6	2.5	2.5
Total exports	22.2	22.3	24.4	25.0	25.8	26.7	27.3	27.8	28.4	29.0	29.6	30.2
<i>Percent</i>												
U.S. trade share	11.7	12.2	11.4	11.1	10.7	10.3	9.9	9.6	9.3	8.9	8.5	8.2

1/ Excludes intra-EU trade, covers EU-15.

2/ Includes intra-FSU trade.

3/ Other Western Europe and Central and Eastern Europe.

The projections were completed in October 2001 based on policy decisions and other information known at that time.



Table 42. All cotton trade baseline projections

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
<i>Imports, million bales</i>												
Importers												
European Union <sup>1</sup>	4.0	4.1	4.0	4.1	3.9	3.8	3.8	3.7	3.6	3.5	3.4	3.2
Former Soviet Union <sup>2</sup>	2.2	2.3	2.3	2.3	2.4	2.4	2.5	2.5	2.5	2.6	2.6	2.7
Indonesia	2.8	2.7	2.6	2.6	2.7	2.8	2.9	2.9	3.0	3.1	3.2	3.2
Thailand	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8
India	1.6	1.6	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6
Brazil	0.8	1.0	1.0	1.0	1.0	1.1	1.1	1.0	1.0	0.9	0.9	0.9
Eastern Europe	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9
Other Asia & Oceania	2.9	3.3	3.2	3.2	3.3	3.4	3.6	3.7	3.8	4.0	4.1	4.3
Japan	1.1	1.1	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6
South Korea	1.4	1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.0	1.0
China	0.2	0.7	2.3	2.7	3.0	3.1	3.3	3.5	3.9	4.2	4.4	4.6
Taiwan	1.0	1.2	1.2	1.1	1.1	1.1	1.2	1.1	1.1	1.1	1.1	1.1
Turkey	1.6	1.7	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0
Mexico	2.0	1.7	1.7	1.8	1.8	1.8	1.9	1.9	1.9	1.9	2.0	2.0
Other	2.7	2.8	2.7	2.8	2.8	2.9	2.9	3.0	3.1	3.1	3.2	3.3
Total imports	26.8	28.3	29.7	30.1	30.4	30.8	31.2	31.6	32.1	32.5	32.9	33.3
<i>Exports, million bales</i>												
Exporters												
Former Soviet Union <sup>2</sup>	5.3	5.1	5.0	4.8	4.9	4.9	4.9	5.0	5.1	5.1	5.1	5.1
Australia	3.9	3.2	3.2	3.1	3.3	3.4	3.5	3.7	3.8	3.9	4.1	4.2
Argentina	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
Pakistan	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.4
India	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.8
China	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
Egypt	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Other Latin America	0.9	1.0	1.2	1.4	1.7	1.8	1.9	1.9	2.1	2.1	2.3	2.4
Sub-Saharan Africa <sup>3</sup>	4.4	4.9	4.6	4.5	4.6	4.8	4.9	5.0	5.1	5.2	5.3	5.4
Other foreign	3.2	3.1	3.0	3.0	3.1	3.2	3.2	3.2	3.3	3.4	3.4	3.5
United States	6.8	9.0	10.5	11.0	10.5	10.4	10.4	10.3	10.2	10.1	10.0	9.9
Total exports	26.3	28.0	29.4	29.8	30.1	30.5	30.9	31.3	31.8	32.2	32.6	33.0
<i>Percent</i>												
U.S. trade share	25.7	32.2	35.7	37.0	35.0	34.2	33.5	32.8	32.0	31.3	30.6	30.0

1/ Includes intra-EU trade, covers EU-15.

2/ Includes intra-FSU trade.

3/ Includes Republic of South Africa.

The projections were completed in October 2001 based on policy decisions and other information known at that time.

Table 43. Soybean trade baseline projections

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
<i>Imports, million metric tons</i>												
Importers												
European Union <sup>1</sup>	17.8	18.3	18.1	18.4	18.3	18.1	17.9	17.8	17.9	17.9	17.9	17.9
Japan	4.8	4.9	4.9	4.9	4.9	4.8	4.8	4.8	4.8	4.7	4.7	4.7
South Korea	1.4	1.5	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4
Taiwan	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6	2.6
Mexico	4.4	4.6	4.7	4.9	5.1	5.3	5.5	5.6	5.8	6.0	6.2	6.4
Former Soviet Union <sup>2</sup>	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.3
Eastern Europe	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
China	13.2	14.0	15.7	17.1	19.3	20.9	22.6	24.2	25.9	27.5	29.2	30.9
Malaysia	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7
Indonesia	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.8
Other	7.9	8.6	8.8	9.2	9.5	9.7	9.9	10.3	10.4	10.7	10.9	11.2
Total imports	54.2	56.9	58.7	61.0	63.6	65.5	67.3	69.5	71.6	73.7	75.8	78.0
<i>Exports, million metric tons</i>												
Exporters												
Argentina	6.8	7.3	7.6	7.9	8.0	8.1	8.2	8.3	8.4	8.6	8.8	9.0
Brazil	15.1	16.9	18.8	19.7	21.8	23.1	24.6	26.1	27.9	29.3	31.1	32.4
China	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
Other foreign	4.9	4.9	4.7	4.9	4.9	5.1	5.1	5.3	5.2	5.5	5.3	5.7
United States	27.2	26.7	27.5	28.3	28.6	28.8	29.1	29.4	29.7	29.9	30.2	30.5
Total exports	54.2	56.0	58.7	61.0	63.6	65.5	67.3	69.5	71.6	73.7	75.8	78.0
<i>Percent</i>												
U.S. trade share	50.2	47.6	46.8	46.4	45.0	44.1	43.2	42.3	41.4	40.6	39.8	39.1

1/ Includes intra-EU trade, covers EU-15.

2/ Includes intra-FSU trade.

The projections were completed in October 2001 based on policy decisions and other information known at that time.

Table 44. Soybean meal trade baseline projections

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
<i>Imports, million metric tons</i>												
Importers												
European Union <sup>1</sup>	20.3	21.1	21.1	21.1	21.2	21.0	20.6	20.4	20.4	20.5	20.6	20.3
Former Soviet Union <sup>2</sup>	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6
Eastern Europe	2.7	2.9	3.3	3.3	3.4	3.4	3.5	3.5	3.7	3.6	3.9	3.8
Canada	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Japan	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7
China	0.1	0.3	0.5	0.7	1.1	1.7	2.4	3.1	3.8	4.5	5.2	5.9
Southeast Asia	4.3	4.5	4.7	4.9	5.1	5.3	5.5	5.7	5.9	6.0	6.3	6.5
Latin America	3.9	4.1	4.2	4.2	4.3	4.4	4.5	4.5	4.7	4.7	4.9	4.9
North Africa & Middle East	4.4	4.5	4.8	4.9	5.1	5.2	5.3	5.5	5.6	5.8	5.9	6.1
Other	2.9	2.7	2.8	2.9	3.1	3.2	3.3	3.4	3.5	3.7	3.8	3.9
Total imports	40.3	42.1	43.4	44.0	45.3	46.1	47.1	48.0	49.7	50.8	52.8	53.5
<i>Exports, million metric tons</i>												
Exporters												
Argentina	14.8	15.2	15.4	15.8	16.4	16.8	17.3	17.9	19.2	19.8	20.7	20.7
Brazil	10.5	10.9	11.4	11.4	11.8	12.0	12.3	12.5	12.7	13.0	14.0	14.4
India	2.1	2.3	2.3	2.4	2.4	2.5	2.5	2.6	2.6	2.7	2.7	2.8
European Union <sup>1</sup>	5.9	6.0	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
Other foreign	1.5	1.6	1.6	1.6	1.6	1.7	1.7	1.8	1.8	1.8	1.9	1.9
United States	6.9	6.7	6.8	7.0	7.2	7.3	7.3	7.4	7.5	7.6	7.7	7.8
Total exports	41.6	42.7	43.4	44.0	45.3	46.1	47.1	48.0	49.7	50.8	52.8	53.5
<i>Percent</i>												
U.S. trade share	16.5	15.7	15.8	16.0	15.8	15.8	15.6	15.5	15.1	15.0	14.6	14.6

1/ Includes intra-EU trade, covers EU-15.

2/ Includes intra-FSU trade.

The projections were completed in October 2001 based on policy decisions and other information known at that time.

Table 45. Soybean oil trade baseline projections

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
<i>Imports, million metric tons</i>												
Importers												
European Union <sup>1</sup>	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
China	0.1	0.2	0.3	0.5	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
India	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4
Other Asia	1.3	1.6	1.6	1.7	1.8	1.8	2.0	2.0	2.1	2.2	2.4	2.4
Latin America	1.4	1.5	1.4	1.4	1.5	1.5	1.5	1.5	1.6	1.6	1.7	1.7
North Africa & Middle East	2.0	2.1	2.2	2.3	2.3	2.4	2.4	2.5	2.6	2.6	2.7	2.8
Former Soviet Union & Eastern Europe <sup>2</sup>	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Other	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4
Total imports	7.6	8.3	8.4	8.7	9.0	9.3	9.7	10.1	10.6	10.9	11.4	11.7
<i>Exports, million metric tons</i>												
Exporters												
Argentina	3.3	3.3	3.3	3.4	3.7	3.8	3.9	4.0	4.3	4.4	4.7	4.6
Brazil	1.5	1.6	1.4	1.4	1.5	1.6	1.9	2.2	2.3	2.5	2.8	3.1
European Union <sup>1</sup>	1.7	1.7	1.8	1.9	1.8	1.8	1.8	1.8	1.7	1.7	1.7	1.7
Other foreign	0.7	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0
United States	0.6	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.3
Total exports	7.8	8.5	8.4	8.7	9.0	9.3	9.7	10.1	10.6	10.9	11.4	11.7
<i>Percent</i>												
U.S. trade share	8.1	13.1	13.4	13.2	12.9	12.6	12.2	11.8	11.4	11.2	10.9	10.8

1/ Includes intra-EU trade, covers EU-15.

2/ Includes intra-FSU trade.

The projections were completed in October 2001 based on policy decisions and other information known at that time.

Table 46. Beef trade baseline projections

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<i>Imports, thousand metric tons, carcass weight</i>												
Importers												
United States	1,375	1,401	1,417	1,497	1,542	1,588	1,497	1,406	1,361	1,315	1,270	1,225
Japan	1,027	940	960	981	1,028	1,054	1,077	1,095	1,114	1,132	1,147	1,160
South Korea	280	230	250	290	308	327	348	370	393	417	443	471
Taiwan	87	79	83	86	92	97	103	109	115	121	127	133
Philippines	118	70	110	127	130	137	148	160	173	187	202	215
European Union <sup>1</sup>	448	400	440	440	440	440	440	440	440	440	440	440
Russia	496	600	650	718	755	792	825	851	875	904	932	962
Eastern Europe	62	59	47	60	64	66	66	64	62	60	58	55
Egypt	188	75	130	134	134	136	139	141	139	140	140	144
Saudi Arabia	66	66	69	73	77	81	86	90	95	100	105	111
Mexico	420	430	440	481	517	564	616	656	691	730	773	821
Canada	275	310	325	327	329	331	333	335	337	339	341	343
Major importers	4,842	4,660	4,921	5,214	5,416	5,614	5,678	5,717	5,795	5,886	5,977	6,079
<i>Exports, thousand metric tons, carcass weight</i>												
Exporters												
United States	1,141	1,020	1,061	1,100	1,145	1,191	1,236	1,270	1,304	1,349	1,395	1,417
Australia	1,329	1,345	1,370	1,358	1,308	1,285	1,270	1,279	1,287	1,288	1,291	1,290
New Zealand	442	500	530	579	605	616	622	623	621	618	614	608
Other Asia	301	375	410	418	425	431	434	442	451	458	465	472
European Union <sup>1</sup>	640	477	600	749	817	817	817	817	817	817	817	817
Eastern Europe	97	86	79	75	72	70	66	65	64	63	61	60
Ukraine	192	100	75	82	90	98	107	118	130	143	158	174
Argentina	348	150	250	258	269	281	294	310	325	340	357	373
Brazil	480	600	623	609	591	572	561	563	568	578	591	608
Canada	547	560	575	602	621	640	654	677	694	719	733	759
Major exporters	5,517	5,213	5,573	5,829	5,943	6,000	6,062	6,164	6,261	6,373	6,481	6,580

1/ Excludes intra-EU trade, covers EU-15

The projections were completed in October 2001 based on policy decisions and other information known at that time.

Table 47. Pork trade baseline projections

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<i>Imports, thousand metric tons, carcass weight</i>												
Importers												
United States	439	415	435	447	458	467	476	485	492	499	503	508
Japan	995	920	945	978	1,007	1,038	1,048	1,064	1,083	1,099	1,116	1,132
China	177	120	140	171	198	194	194	198	204	205	207	209
Hong Kong	300	335	360	369	378	388	397	407	417	428	439	450
South Korea	173	120	140	142	144	146	149	151	153	155	158	160
Russia	470	600	630	649	668	688	709	730	752	775	798	822
Mexico	276	300	310	319	329	339	349	359	370	381	393	404
Canada	68	75	85	86	88	89	90	92	93	94	96	97
Major importers	2,898	2,885	3,045	3,160	3,269	3,349	3,414	3,486	3,563	3,635	3,710	3,781
<i>Exports, thousand metric tons, carcass weight</i>												
Exporters												
United States	592	699	649	669	692	714	737	760	794	816	839	873
Brazil	163	240	290	305	320	336	352	363	374	385	397	409
Canada	656	710	730	745	759	775	790	804	818	832	847	862
Mexico	59	60	60	61	62	64	65	66	68	69	70	72
European Union <sup>1</sup>	1,470	1,220	1,320	1,185	1,150	1,175	1,185	1,190	1,195	1,205	1,210	1,220
Eastern Europe	312	259	289	295	301	307	313	322	332	342	352	363
Taiwan	0	0	0	0	0	0	0	0	10	15	20	25
China	73	110	145	110	98	99	99	97	95	94	94	93
Major exporters	3,325	3,298	3,483	3,369	3,383	3,470	3,541	3,602	3,686	3,759	3,828	3,916

1/ Excludes intra-EU trade, covers EU-15.

The projections were completed in October 2001 based on policy decisions and other information known at that time.

Table 48. Poultry trade baseline projections

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<i>Imports, thousand metric tons, ready to cook</i>												
Importers												
Russia	1,151	1,300	1,325	1,434	1,495	1,560	1,602	1,655	1,707	1,764	1,820	1,882
European Union <sup>1</sup>	307	317	350	343	336	329	319	313	307	303	300	300
Japan	740	684	710	715	748	769	791	811	831	850	868	887
Hong Kong	280	270	280	284	288	293	297	302	306	311	315	320
China	1,041	950	950	993	1,037	1,084	1,133	1,184	1,225	1,268	1,358	1,406
South Korea	78	100	110	115	118	119	122	126	129	132	136	140
Saudi Arabia	346	400	425	428	439	445	453	462	472	482	490	499
Mexico	357	375	405	420	435	450	470	512	538	573	611	665
Canada	154	150	157	166	169	172	176	179	182	185	189	192
Major importers	4,454	4,546	4,712	4,898	5,065	5,220	5,364	5,544	5,697	5,869	6,088	6,290
<i>Exports, thousand metric tons, ready to cook</i>												
Exporters												
Brazil	949	1,215	1,580	1,706	1,803	1,873	1,939	2,007	2,063	2,110	2,171	2,243
European Union <sup>1</sup>	1,032	1,018	1,050	1,002	1,012	1,022	1,032	1,043	1,053	1,074	1,095	1,117
Hungary	108	110	105	109	109	121	126	131	137	143	149	155
China	504	520	530	538	560	586	615	641	668	700	740	772
Hong Kong	9	8	9	9	10	10	11	11	11	12	12	13
Thailand	336	380	418	433	441	452	461	469	477	485	492	499
Saudi Arabia	20	20	20	23	24	28	30	33	36	39	42	44
United States	2,825	3,079	3,141	3,197	3,258	3,320	3,400	3,482	3,552	3,602	3,656	3,707
Major exporters	5,783	6,350	6,853	7,015	7,218	7,411	7,613	7,817	7,997	8,164	8,358	8,549

1/ Excludes intra-EU trade, covers EU-15.

The projections were completed in October 2001 based on policy decisions and other information known at that time.

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