

# USDA Agricultural Baseline Projections to 2015

## Interagency Agricultural Projections Committee

### Introduction

This report provides longrun baseline projections for the agricultural sector through 2015. Projections cover agricultural commodities, agricultural trade, and aggregate indicators of the sector, such as farm income and food prices. The baseline identifies major forces and uncertainties affecting future agricultural markets; prospects for global long-term economic growth, consumption, and trade; and future price trends, trade flows, and U.S. exports of major farm commodities.

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. The baseline assumes that the Farm Security and Rural Investment Act of 2002 (the 2002 Farm Act) and The Energy Policy Act of 2005 remain in effect through the projection period. Additionally, the Agricultural Reconciliation Act of 2005 is assumed to be in force. 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 current farm legislation, with very specific external circumstances. Thus, the baseline is a neutral backdrop, reference scenario that 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 October through December 2005 in support of the fiscal year 2007 President's Budget Estimates. Projections reflect a composite of model results and judgment-based analysis. Normal weather is assumed. Also, the baseline assumes no further outbreaks of plant or animal diseases. Short-term projections used as a starting point in the baseline are from the November 2005 *World Agricultural Supply and Demand Estimates* report.

## Overview of Baseline Assumptions and Projections

**Key assumptions underlying the baseline projections include the following:**

### *Economic growth*

- World economic growth is projected to increase at a 3.2-percent average annual rate between 2006 and 2015, after averaging 3 percent annually between 2001 and 2005. U.S. gross domestic product (GDP) slows from the high rates in 2004 and 2005 toward a sustainable longrun rate near 3 percent. Strong economic growth in developing countries of about 5 percent annually is projected for 2006-15.

### *Population*

- Growth in global population is assumed to continue to slow in the baseline, to an average of about 1.1 percent per year over the projection period compared with an annual rate of 1.7 percent in the 1980s. Although slowing, population growth rates in developing countries remain above those in the rest of the world. As a consequence, the share of world population accounted for by developing countries increases to over 81 percent by 2015, up from about 80 percent in 2005.

### *The value of the U.S. dollar*

- The U.S. dollar is assumed to appreciate slowly in real terms, remaining relatively high by historical standards. A strengthening U.S. dollar in the baseline assumes that capital moves into the United States to take advantage of well-functioning financial markets and high expected long-term productivity growth.

### *Oil prices*

- Large increases in oil prices from late 2002 through 2005 resulted from strong crude oil demand, largely reflecting world economic recovery and rapid manufacturing growth in China and India. From 2007 to 2010, real oil prices are projected to fall as new crude supplies help offset the rise in demand from Asia. In subsequent years, crude oil prices are projected to rise, but only slightly faster than the general inflation rate. Factors expected to constrain longrun oil price increases include new oil discoveries; new technologies for finding, extracting, and refining oil; the ability to switch to non-petroleum fuels; and the ability to increase energy efficiency by substituting nonenergy inputs for energy.

### *U.S. agricultural policy*

- The 2002 Farm Act, as amended, is assumed to continue through the projection period.
- Area enrolled in the Conservation Reserve Program (CRP) is assumed to rise to 39.2 million acres from about 35 million acres currently enrolled.

- The Agricultural Reconciliation Act of 2005 is assumed to be in force for the baseline projections. As part of this legislation, authority to issue cotton user marketing certificates is repealed following the 2005/06 cotton marketing year, thereby ending the Step-2 cotton program. Also, national dairy market loss payments, administered under the Milk Income Loss Contract Program, are extended, with a reduced payment factor of 34 percent of the difference between \$16.94 per hundredweight and the Boston Class I price through August 2007.

### *Ethanol*

- The Renewable Fuel Program of the Energy Policy Act of 2005 mandates renewable fuel use in gasoline (with credits for biodiesel) to reach 7.5 billion gallons by calendar year 2012, nearly double 2005's level. This program largely affects production of ethanol, which is primarily produced from corn. Additionally, relatively high prices for oil contribute to favorable comparative returns for ethanol production, providing further economic incentives for expansion in the production capacity of that industry over the next several years. To reflect this ongoing expansion, the baseline assumes that the legislation's renewable fuel standard is significantly exceeded through 2010. In subsequent years, ethanol production is assumed to be closer to the levels in, or levels based on, the legislation.

### *Cattle and beef trade*

- The baseline assumes a gradual rebuilding of U.S. beef exports to Japan and South Korea. Canada's exports of live cattle to the United States are assumed to remain limited to steers and heifers under 30 months old for immediate slaughter and Canadian feeder cattle that enter U.S. feedlots and are slaughtered before reaching 30 months of age.

### *International policy*

- Baseline trade projections assume that countries comply with existing bilateral and multilateral agreements affecting agriculture and agricultural trade. The baseline incorporates effects of trade agreements and domestic policy reforms in place in November 2005. The Central American and Dominican Republic Free Trade Agreement is assumed for the sugar baseline projections starting in calendar year 2006.
- 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 reforms underway in many developing countries are assumed to continue.

## **Key results in the baseline projections include the following:**

### *U.S. aggregate indicators*

- Net farm income is projected to be relatively stable from 2006 to 2015, after declining from historically high levels in 2004 and 2005. Overall farm cash receipts increase through the projections due to growing domestic use and export demand as well as increases in agricultural commodity prices. Rising production expenses and lower government payments, however, offset gains in cash receipts and other sources of farm income. With government payments declining, the agriculture sector relies increasingly on the market for more of its income. Cash receipts represent more than 89 percent of gross cash income at the end of the projections, up from about 85 percent in 2005. Net farm income projections average about \$54 billion annually for the next decade, compared with \$48 billion in the 1990s. Stable net farm income assists in asset accumulation and debt management. The debt-to-asset ratio falls moderately in the projections, continuing a generally declining trend since the mid-1980s.
- The value of U.S. agricultural exports rises in the baseline as steady global economic growth and stronger world trade lead to gains for U.S. agricultural export volumes and higher commodity prices. High-value product exports continue to grow in importance. Increases in U.S. consumer income and demand for a large variety of foods underlie growth in U.S. agricultural imports. Imports of processed foods are expected to continue growing in importance. Overall, the U.S. agricultural trade balance is projected to show a small surplus through most of the baseline, although it will remain lower than in the past two decades.
- Consumer food prices are projected to rise less than the general inflation rate.

### *U.S. agricultural commodities*

- Corn used to produce ethanol in the United States more than doubles the 2004/05 level by 2015/16. This increase reflects the Renewable Fuel Program of the Energy Policy Act of 2005, large ongoing ethanol plant construction, and economic incentives provided by continued high oil prices. Increased feeding of distillers dried grains, a coproduct of dry mill ethanol production, helps meet growing livestock feed demand. Thus, feed use of corn rises only slowly in the projections.
- Growth in the food use of wheat is projected to be somewhat slower than the rate of population increases, reflecting dietary adjustments by some consumers to smaller overall portions, including lower carbohydrates.
- Growth in domestic soybean crush is largely driven by increasing demand for domestic soybean meal, mostly because of rising feed demand for expanding meat production. Domestic demand for soybean meal is tempered somewhat by a rising volume of coproducts from ethanol production.

- Mill use of upland cotton in the United States falls through the projection period as apparel imports by the United States continue to increase, reducing domestic apparel production and lowering the apparel industry's demand for fabric and yarn produced in the United States.
- Steady expansion of domestic food use of rice is projected over the baseline, largely due to an increasing share of the U.S. population of Asian and Latin American descent. Use of rice in processed foods and pet foods also increases.
- Consumption of horticultural products continues to rise in the baseline. Imports play an important role in domestic supply during the winter and, increasingly, during other times of the year, providing U.S. consumers with increased variety of horticultural products.
- With the end of the U.S. tobacco marketing quota and price support program, tobacco leaf production initially declines as some farmers exit the industry. Production then rises through the rest of the projections, primarily reflecting increases by the remaining growers. Declining cigarette consumption in the United States is an important factor underlying projected decreases in domestic use of tobacco leaf. Exports of tobacco leaf are projected to increase, however, reversing the generally downward trend of recent years, as lower tobacco leaf prices than during the last several years under the tobacco program make U.S. leaf more competitive in global trade.
- Higher grain prices reduce returns to U.S. meat producers and slow production gains. Higher levels of per capita meat consumption are projected, with poultry accounting for a larger share of the total. While consumer expenditures on meat increase, they represent a declining share of disposable income.
- Productivity gains are expected to boost milk output per cow and total milk production throughout the projections. Milk cow numbers are expected to decline after 2006 at a relatively slow pace as increasing specialization of dairy farms over time makes exit rates lower than in past decades.

### *Agricultural trade*

- Population and income are two important factors underlying global demand for food and agricultural products, world trade, and U.S. exports. With population growth in the world continuing to slow in the projections compared with previous decades, income growth will become a relatively more important factor underlying strengthening food and agricultural demand. Economic growth in developing countries is especially important because consumption of food and feed are particularly responsive to income growth in those countries, with movement away from staple foods and increased diversification of diets.
- Increases in global demand for food and agricultural products provide the foundation for gains in agricultural trade and U.S. exports. The United States will remain competitive in global agricultural markets, although trade competition will continue to be strong.

Expanding production in a number of countries, such as Brazil, Argentina, Canada, Ukraine, and Kazakhstan, provides competition to U.S. exports for some agricultural commodities. A strengthening U.S. dollar assumed in the baseline also is a constraining factor for U.S. agricultural competitiveness and export growth in the longer run. Nonetheless, increases in exports contribute to gains in cash receipts for U.S. farmers.

- Steady longrun growth in the livestock sectors of developing countries in Asia, Latin America, North Africa, and the Middle East accounts for most of the growth in world coarse grain imports projected during the next decade. The United States is the major corn exporter in the world. However, with increasing use of corn for U.S. ethanol production, particularly over the next several years, U.S. corn exports show very little growth through 2010/11. In response, increased corn production and exports are assumed in this period for Argentina and Brazil. China is also assumed to increase corn production as more U.S. corn is used in the production of ethanol. This changes China's net corn trade by slowing the decline in Chinese exports and the increase in its imports. Nonetheless, China is projected to be a net importer of corn in the longer run, reflecting declining stocks of grain and increasing demand for feed for its growing livestock sector.
- Strong income and population growth in developing countries generates increasing demand for vegetable oils for food consumption and for protein meals used in livestock production. Brazil's rapidly increasing soybean area enables it to gain a larger share of world soybean and soybean meal exports, despite increasing domestic feed use. Argentina is the leading exporter of soybean meal and soybean oil, reflecting the country's large and growing crush capacity, its small domestic market for soybean products, and an export tax structure that favors the exports of products rather than soybeans.
- The United States, Australia, the European Union (EU), Canada, and Argentina have historically been the primary exporters of wheat, although exports from the Black Sea region have grown in the past 10 years. Over the next decade, Kazakhstan and Ukraine are projected to have a growing importance in world wheat trade, reflecting low costs of production and continued investments in their agricultural sectors. However, high year-to-year volatility in these countries' production and trade can be expected due to weather extremes and related yield variation.
- Cotton consumption and textile production are projected to increase in countries where labor costs are low, such as China, India, and Pakistan. China is the largest importer of cotton in the world. Although China's cotton imports are expected to grow more slowly than the rapid gains since 2001, these increases account for the gains in global cotton trade in the projections. The United States continues as the world's leading cotton exporter, reflecting its large production capacity and its reduced domestic mill use of cotton as textile imports continue to grow.
- Long-grain varieties of rice account for around three-fourths of global rice trade and are expected to account for the bulk of trade growth over the next decade. Long-grain rice is imported by a broad spectrum of countries in South and Southeast Asia, much of the Middle East, nearly all of Sub-Saharan Africa, and most of Latin America. Thailand and Vietnam

remain the world's largest rice-exporting countries, while India is projected to surpass the United States as the third largest rice exporter.

- U.S. meat exports benefit from stronger foreign economic growth in the baseline. Although U.S. beef exports to Japan and South Korea are projected to gradually rebuild, total U.S. beef exports do not return to the levels attained prior to the U.S. case of bovine spongiform encephalopathy (BSE) in 2003.
- Canada continues to be a strong competitor with the United States in pork exports to Pacific Rim nations and Mexico. Canada is also the major supplier of live hog imports by the United States. Brazil is a major pork exporter. However, the presence of foot-and-mouth disease limits Brazilian pork exports to some markets, such as Japan and South Korea.
- Avian influenza is assumed to not significantly affect overall consumer demand for poultry. However, poultry exports from countries affected by the disease, such as Thailand, China, and Vietnam, are expected to be limited to fully cooked products. Brazil remains a leading poultry exporter, as low production costs allow their poultry sector to remain competitive in global trade.