

USDA Agricultural Projections to 2016

Interagency Agricultural Projections Committee

Introduction

This report provides longrun projections for the agricultural sector through 2016. Projections cover agricultural commodities, agricultural trade, and aggregate indicators of the sector, such as farm income and food prices. This report 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 and trade policies, the weather, and international developments. The report assumes that the Farm Security and Rural Investment Act of 2002 (the 2002 Farm Act), the Energy Policy Act of 2005, and the Agricultural Reconciliation Act of 2005 remain in effect through the projection 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 current farm legislation, with very specific external circumstances. Thus, the projections provide 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.

Historically, projections in prior years' releases of this report have been the same as those used in preparing the President's Budget baseline. However, the President's Budget baseline this year assumes that biofuel blending tax credits and the ethanol import tariff are not extended beyond their currently legislated expiration dates. The projections in this report assume those tax credits and tariff are extended. (See box, page 24, for further discussion and a comparison of selected results of these alternative scenarios.)

The projections in this report were prepared in October through December 2006 and reflect a composite of model results and judgment-based analyses. Normal weather is assumed. Also, the projections assume no further outbreaks of plant or animal diseases. Short-term projections used as a starting point in this report are from the November 2006 *World Agricultural Supply and Demand Estimates* report.

Overview of Assumptions and Results

Key assumptions underlying the projections include the following:

Economic growth

- World economic growth is projected to increase at a 3.4-percent average annual rate between 2007 and 2016, after averaging 2.9 percent annually in 2001-06. U.S. gross domestic product (GDP) slows over the next several years from 3.4 percent in 2006 toward a sustainable rate of about 3 percent over the longer term. Strong economic growth in developing countries of 5.6 percent annually is projected for 2007-16.

Population

- Growth in global population is assumed to continue to slow 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 most 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 83 percent by 2016, up from 82 percent in 2005.

The value of the U.S. dollar

- The U.S. dollar remains relatively strong by historical standards, depreciating slightly in 2008 and then continuing a long-term pattern of slow appreciation through the rest of the projection period. A strengthening U.S. dollar assumes that capital moves into the United States because of well-functioning and diverse financial markets and high expected long-term productivity growth.

Oil prices

- Large increases in oil prices over the past several years reflected strong demand for crude oil resulting from world economic recovery and rapid manufacturing growth in China and India. In 2007 through 2011, crude oil prices are expected to drop modestly and then rise by less than the inflation rate as new crude supplies help offset the rise in demand from Asia. After 2011, oil prices are projected to rise slightly faster than the general inflation rate.
- Underlying these longer term price increases, world oil demand is expected to rise due to strong global economic growth, particularly in highly energy-dependent economies in Asia. Factors expected to constrain longer run oil price increases include new oil discoveries, new technologies for finding and extracting oil, the ability to switch to nonpetroleum fuels, the ability to increase energy efficiency by substituting nonenergy inputs for energy, and continued expansion and improvement in renewable energy.

U.S. agricultural policy

- The 2002 Farm Act, as amended, and the Agricultural Reconciliation Act of 2005 are assumed to continue through the projection period.
- Area enrolled in the Conservation Reserve Program (CRP) is assumed to decline through 2009 as high prices encourage the return of some land to production when CRP contracts expire. CRP acreage is then assumed to gradually rise to its legislated maximum of 39.2 million acres by the end of the projections, with higher CRP rental rates.

U.S. biofuels

- The Renewable Fuel Program of the Energy Policy Act of 2005 mandates that renewable fuel use in gasoline (with credits for biodiesel) reach 7.5 billion gallons by calendar year 2012. The legislation also contributed to the elimination of methyl tertiary butyl ether (MTBE) as a gasoline additive. The projections in this report assume the tax credits available to blenders of biofuels (ethanol and biodiesel) and the ethanol import tariff remain in effect through the projection period. These factors, along with relatively high prices for oil, contribute to favorable returns for ethanol production, providing economic incentives for a continued strong expansion in the production capacity of that industry over the next several years, primarily produced from corn. As a result, over 12 billion gallons of ethanol are assumed to be produced annually in the United States by the end of the projections. Biodiesel production is assumed to increase to 700 million gallons in 2011/12 and then level off.

Cattle and beef trade

- The projections assume 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

- Trade projections assume that countries comply with existing bilateral and multilateral agreements affecting agriculture and agricultural trade. The report incorporates effects of trade agreements and domestic policy reforms in place in November 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.
- The European Union (EU) expanded from 25 to 27 countries with the accession of Romania and Bulgaria on January 1, 2007. EU projections in this report pertain to the EU-25. Romania and Bulgaria are included in the Other Europe region, although adjustments were made to account for accession.

International biofuels

- The production of biofuels is experiencing rapid growth in a number of countries. The projections assume that the most significant increases in foreign biofuel production over the next decade will be in the EU, Brazil, Argentina, and Canada. In particular, the projections assume that the EU biofuel target of 5.75 percent of total transportation fuel use by 2010 is only partially met by that date, and is still not fully reached by 2016.

Key results in the projections include the following:

Steady domestic and international economic growth in the projections supports gains in consumption, trade, and prices of agricultural products. Additionally, the projections reflect increased demand for biofuels, particularly in the United States and the EU.

U.S. aggregate indicators

- Net farm income is projected to be relatively strong during the projection period, averaging about \$67 billion. Increases in corn-based ethanol production provide a major impetus for this strong income projection. Growth in export demand also contributes to increases in agricultural commodity prices and gains in farm cash receipts. Higher commodity prices lower government payments for price-dependent benefits, although annual CRP payments increase. Rising production expenses and lower government payments offset some of the gains in cash receipts and other sources of farm income. With lower government payments, the agriculture sector relies increasingly on the market for its income. Cash receipts represent about 90 percent of gross cash income during most of the projection period, up from about 85 percent in 2005. Strong and 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 projections as steady global economic growth and stronger world trade lead to gains for U.S. agricultural export volumes and higher commodity prices. Higher commodity prices due to expansion of global biofuel demand also contribute to the gains in export values. Increases in U.S. consumer income and demand for a large variety of foods underlie growth in U.S. agricultural imports.
- On average, consumer food prices are projected to rise more slowly than the general rate of inflation over the next decade, although increases in meat prices push food prices up faster in some years. Consumer expenditures for food away from home continue to grow in importance and account for more than half of overall food spending during most of the projection period.

Commodity price relationships

- During the next 3-4 years, rapid expansion in global production of biofuels changes the price relationships among various agricultural commodities. Increased demand for grain (especially corn) used to produce ethanol in the United States raises the price of corn

relative to prices for other grains and soybeans, although prices for those crops also rise, buoyed by acreage adjustments and production changes and/or by their feed value as a replacement for corn.

- Expansion of biodiesel production globally results in prices for vegetable oils rising in comparison to prices for oilseeds and protein meals as more of the crush value of oilseeds derives from the oil. As a consequence, prices of protein feeds (such as soybean meal) rise relatively less than prices of feedstuffs used primarily as a source of energy (such as corn).
- Prices of poultry and pork in the United States rise relative to the price of beef because cattle can more effectively use the increasing supply of distillers grains, a coproduct of dry mill ethanol production. Corn, needed for broilers and swine, becomes more expensive while distillers grains, used for cattle, become more abundant and relatively less expensive.

U.S. agricultural commodities

- Strong expansion of corn-based ethanol production in the United States affects virtually every aspect of the field crops sector, ranging from domestic demand and exports to prices and the allocation of acreage among crops. Overall plantings expand and a higher portion of the total is planted to corn. Higher feed costs and the increased availability of distillers grains also affect the livestock sector.
- Corn used to produce ethanol in the United States continues strong expansion through 2009/10, with slower growth in subsequent years. By the end of the projections, ethanol production exceeds 12 billion gallons per year, using more than 4.3 billion bushels of corn. The projected large increase in ethanol production reflects the Energy Policy Act of 2005, the elimination of use of MTBE as a gasoline additive, ongoing ethanol plant construction, and economic incentives provided by continued high oil prices. Feed use of corn declines in the initial years of the projections and then rises only moderately as increased feeding of distillers grains helps meet livestock feed demand, particularly for beef cattle.
- 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. Feed use of wheat rises sharply in the initial years of the projections as higher corn prices encourage increases in wheat feeding, particularly in the summer quarter. As corn prices fall, wheat feeding declines after 2010/11 due to relatively higher wheat prices compared with corn.
- Soybean acreage falls in the projections as more favorable returns to corn production draw land from soybeans. Longrun growth in domestic soybean crush is mostly driven by increasing demand for domestic soybean meal for livestock feed. Some gains in crush also reflect increasing domestic soybean oil demand for biodiesel production through 2011/12.
- Mill use of upland cotton in the United States falls in the projections as U.S imports of apparel continue to increase, reducing domestic apparel production and lowering the apparel industry's demand for fabric and yarn produced in the United States.

- Slow expansion of domestic food use of rice is projected. Growth is only slightly faster than population growth, well below the rates of growth in the 1980s and 1990s when per capita use rose rapidly.
- The sugar projections assume the elimination of Mexico's soft drink and distribution taxes, resulting in higher levels of use of high fructose corn syrup by Mexico's beverage industry and higher exports of sugar from Mexico to the United States.
- The tobacco sector continues to adjust to the ending of the U.S. tobacco marketing quota and price support program. After declining in 2005 when nearly half of tobacco producers exited the industry, tobacco leaf production increases in the projections as many remaining growers expand operations. 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 moderately.
- The production value of U.S. horticultural crops is projected to grow by 2.5 percent annually over the next decade. Consumption of horticultural products continues to rise in the projections. Imports play an important role in domestic supply during the winter and, increasingly, during other times of the year, providing U.S. consumers with a larger variety of horticultural products.
- Production of all meats slows or declines in the first half of the projections, reflecting higher feed costs and lower producer returns as more corn is used in the production of ethanol. After those production adjustments, strong domestic demand and some strengthening in meat exports result in higher prices and higher returns, providing economic incentives for expansion in the sector. How the sector adjusts to the increased availability of distillers grains will also be important.
- Per capita meat consumption declines in the first half of the projections as the sector lowers overall production, but then rebounds somewhat in subsequent years. Rising incomes facilitate gains in consumer spending on meat. Nonetheless, overall meat expenditures represent a declining proportion of disposable income.
- Productivity gains are expected to boost milk output per cow and total milk production, although some slowing in these increases occurs early in the projection period due to higher feed costs. Milk cow numbers are expected to decline after 2006, particularly in 2008-10 as feed costs rise.

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 becomes 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, including Brazil, Argentina, Canada, Ukraine, and Russia, provides competition to U.S. exports for some agricultural commodities. A strengthening U.S. dollar assumed in the projections 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 and prices rise. In response, increased corn production and exports are assumed for Argentina, Bulgaria, Romania, Ukraine, Republic of South Africa, and Brazil. China is also assumed to increase corn production, which changes its net corn trade by slowing the decline in its exports and the increase in its imports. Nonetheless, China is projected to become a net importer of corn in the longer run, reflecting declining stocks of grain and increasing demand for feed for its growing livestock sector.
- Vegetable oil prices rise relative to prices for oilseeds and protein meals because of expanding biodiesel production in a number of countries. This relatively new source of oilseed products demand amplifies already rising uses of vegetable oils for food consumption and protein meals for livestock production in developing countries, resulting from strong income and population growth. 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 exports of soybean products rather than soybeans. The former Soviet Union, Eastern Europe, and Southeast Asia increase rapeseed and palm oil production for use as biodiesel feedstocks.
- The United States, Australia, the 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, Russia 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 and other 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, Vietnam, India, and the United States remain the world's largest rice-exporting countries.
- U.S. meat exports benefit from strong foreign economic growth. 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 first U.S. case of bovine spongiform encephalopathy (BSE) in December 2003.
- Mexican pork imports rise rapidly, driven by increases in income and population. Higher income countries of East Asia increase pork imports as their domestic hog sectors are constrained by environmental concerns and high imported feed costs. Brazil continues to be a major pork exporter, although the presence of foot-and-mouth disease in Brazil limits Brazilian pork exports to some markets.
- 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 and China, are expected to be limited to fully cooked products. Brazil remains a leading poultry exporter as low production costs allow the Brazilian poultry sector to remain competitive in global trade.