Overview of the 2001 U.S. and World Outlook

Major Conditioning Assumptions

The Macroeconomic Environment

Baseline projections largely depend on two external factors, macroeconomic assumptions and agricultural policy assumptions. Macroeconomic projections used in the FAPRI baseline were obtained from Standard and Poor’s DRI.

By 2000, world economic growth had largely recovered from the effects of the Asian and Russian economic crises. World real gross domestic product (GDP) grows an average of 3.2 percent over the baseline period. Most Asian and Latin American countries continue the strong recovery exhibited in 1999 and 2000 in the baseline period, reaching long-run growth rates near 5 percent by 2002. The countries of the Former Soviet Union (FSU) showed strong economic recovery in 2000, and they continue to grow at an average of 4.5 percent annually throughout the baseline.

Among developed countries, the United States experiences a slowing in the growth of economic activity in 2001 to 2.7 percent, but growth is robust for the remainder of the baseline, averaging 3.5 percent annually in real terms. The European Union experiences a gradual decline in real GDP growth, reaching a long-run increase of 2.3 percent annually. Japan, which has the second largest economy in the world, averages 1.4 percent annual growth in real GDP over the baseline.

Asian countries exhibit strong growth in the baseline, with real GDP increasing between 4 and 8 percent annually. Latin American countries experience stable economic growth between 4 and 6 percent annually over the baseline, and much of Africa and the Middle East demonstrate comparable economic strength.

Most currencies in developed countries appreciate relative to the U.S. dollar during the baseline period. The euro, which depreciated more than 15 percent in 2000, appreciates 7.4 percent relative to the U.S. dollar in 2002 and appreciates more gradually for the remainder of the baseline, reaching $1.13/euro by 2010. The yen depreciates in 2001/02 and then moderately appreciates for the remainder of the projection period, reaching 110 yen per U.S. dollar in 2010. Currencies of all major exporting countries appreciate relative to the U.S. dollar, except the Brazilian real, which depreciates more than 4 percent annually.

Agricultural Policy Assumptions

The FAPRI baseline assumes that all government programs and international agreements currently in effect will remain in place over the projection period. There has been a significant impact on agricultural trade by the unilateral trade liberalization and farm policy reforms undertaken by various countries.

Notable farm policy reforms included in the FAPRI outlook include the 1996 U.S. Federal Agriculture Improvement and Reform (FAIR) Act and the Berlin Accord on Agenda 2000 reforms in the European Union. Although the FAIR Act only includes provisions through 2002, these provisions are extended at 2002 levels to the end of the baseline period. Loan rates are fixed in the baseline at the maximum levels allowed, and the Export Enhancement Program (EEP), though available, is not used in the projection period. The baseline also incorporates the provisions of the 2000 emergency spending package. The provisions of the Berlin Accord are implemented in the baseline as outlined in the legislation, including the dairy sector reforms from 2005 to 2007.

Among the multilateral trade agreements, the Uruguay Round (UR) Agreement of the World Trade Organization (WTO) has had the largest impact on agricultural trade. The largest, most direct impacts of the UR agreement are the disciplinary actions placed on export subsidies and market access. These changes have their greatest effect on markets for wheat, coarse grains, meats, and dairy products. Industrialized members of the WTO implemented the last Uruguay Round Agreement on Agriculture (URAA) concessions in 2000, while developing members will spread out their concessions until 2004. After 2004, all WTO provisions are assumed to remain constant until 2010/11. All members of the WTO returned to negotiations in 1999, which did not lead to any foreseeable policy change in the medium term. The potential results of these negotiations are not accounted for in this analysis. Finally, the FAPRI baseline does not make any assumptions on China’s accession to the WTO or enlargement of the European Union to include the Central and Eastern European Countries (CCECs).
As in the 2000 FAPRI outlook, the adjusted Chinese data series were used in the FAPRI international livestock model to generate the projections shown in the world meat section of this publication. The adjusted estimates of historical production and consumption are available online at www.fapri.iastate.edu in the spreadsheets containing the country-specific projections for the livestock sector. For comparison purposes, FAPRI provides projections based on official data. These projections were derived by applying the year-to-year percentage change generated from the model projections to the official historical data. Discrepancies between supply and demand were allocated evenly to production and consumption projections to force an equilibrium in the domestic market.

The Outlook for U.S. Agriculture

Crops

For the U.S. crops sector, the short-term projections suggest continued pressure on prices, with the long-range outlook showing modest improvement. Since 1996, the crops sector generally has seen favorable yields and higher acreage levels while at the same time demand has been rather sluggish. The result has been that production has exceeded disappearance and stock levels have recovered. Subsequently, prices have fallen, in some cases reaching the lowest levels since the mid 1980s. Looking forward, under the assumption of trend yields, prices for wheat and feed grains show modest recovery in 2001, but they still remain below historical averages. Both domestic and export demand continue to strengthen. For soybeans and cotton, little if any price recovery is expected for 2001.

Planted area for corn and wheat declines in 2001. The decline in corn area can be attributed to the increase in fertilizer prices, as well as strong competition from soybeans due to the soybean loan rate. Continued weakness in wheat prices, coupled with poor planting conditions this past fall, lead to the lowest wheat area since 1973. For soybeans, the loan rate leads to another increase in planted area.

Looking toward the end of the baseline, crop prices recover to levels in line with historical averages. For example, corn prices reach $2.50 per bushel, and wheat prices top $3.50 by 2010. Soybean prices remain below historical averages due to continued pressures from the supply side. The loan rate allows U.S. acreage to remain high despite low market prices. In addition, acreage in South America continues to expand. Income growth fuels the demand for food on a global basis, allowing U.S. exports to expand. In addition, domestic demand expands as the U.S. livestock sector increases production levels. With demand growth outpacing supply, stock levels of the major grains and oilseeds decline from their recent highs.

Livestock, Poultry, and Dairy

The outlook for the U.S. cattle industry is characterized by strong prices through 2003. The beef cycle is in a liquidation phase of the herd, continuing to tighten the supply of feeder calves. The result is a strengthening in prices through 2003, with feeder steer prices averaging above $95 per hundredweight. For beef, the long-term outlook depends on relatively stable domestic demand and continued growth in exports.

The U.S. pork sector experienced recovery in 2000 as prices rebounded from the low levels of the previous two years. As a result, increases in the breeding herd lead to higher production in 2001 and 2002. Prices for 2002 are pressured lower due to the higher production. While still below the levels observed in the mid 1990s, pork prices recover and average above $40 per hundredweight for much of the projection period. Despite a stable to slightly declining breeding inventory, production approaches 22 billion pounds by 2010 based on gains in productivity.

Broiler production reaches 30.9 billion pounds in 2001, an increase of 800 million pounds over the 2000 level. The long-term outlook for broiler production is for continued growth, but at a somewhat slower rate than that seen during the 1990s. Twelve-city broiler prices increase in 2001, reaching slightly over $0.57 per pound. Prices remain flat over the baseline as inexpensive feed prices keep supplies increasing.

U.S. dairy cow numbers decline over the projection period as reductions in many states are not offset by growth in areas like the Southwest. Dairy cow numbers continue to increase in California over the baseline period. The rate of growth is slower than that seen during the 1990s. Milk production also continues its growth, as the increase in productivity more than offsets a declining herd size. With the assumed removal of price supports, the average price
for “all milk” falls to $11.78 per hundredweight in 2002. As demand for cheese and fluid milk increases throughout the decade, prices recover to $13.35 by 2010.

**Government Outlays and Farm Income**

The combination of two assistance packages and heavy loan deficiency payments (LDPs) pushed government costs to a record $32 billion in fiscal year (FY) 2000. Outlays fall to $8 billion by the end of the baseline with one-half of the costs associated with contract payments authorized under the FAIR Act. The decline from FY 2003 to the end of the baseline is associated with further LDP reductions.

Increased production and higher prices lead to recovery in crop cash receipts over the baseline period. For 2001, receipts grow by almost $4 billion. Growth in 2001 livestock receipts is primarily due to cattle and broilers. Dairy and broilers account for the long-term expansion in receipts. With higher fuel costs, expenses for manufactured inputs grew by almost $3 billion in 2000. Expenses show another significant increase in 2001 due to higher fertilizer prices. Expenses moderate somewhat in 2002, as fuel and fertilizer prices are projected to soften.

The combination of lower government payments and higher production expenses leads to a decline of almost $6 billion in net farm income in 2001. Net income is pushed even lower in 2002 as government payments continue to decline. In addition, lower prices for hogs and milk squeeze total receipts.

**The Outlook for World Agriculture**

**Wheat**

Since peaking in 1996/97, world wheat area has declined continuously, falling nearly 15 mha. In 2000/01, world wheat area falls below its 1995/96 level. However, strengthening world wheat prices reverse this downward trend by 2001/02. World wheat area rises 4.3 mha between 2000/01 and 2002/03, mainly due to growth in the United States, China, Russia, and Ukraine. Wheat area rises more slowly after 2003, averaging 0.1 percent annually. Boosted by growing international demand, the average U.S. wheat price at Gulf ports grows 2.76 percent annually over the baseline, reaching $159 per mt in 2010/11.

World wheat production grows an average of 1.44 percent annually, with a total increase of nearly 90 mmt over the outlook period. The EU accounts for approximately one-quarter of this increase. World wheat trade decreases slightly in the first two years of projection, losing approximately 2.5 mmt in 2001/02 as compared to 1999/00 levels. In the remainder of the outlook period, world wheat trade is pushed up by the increasing demand in developing countries. World wheat trade rises nearly 21 percent, adding 18.9 mmt over the next decade.

On the import side, the greatest growth occurs in Asian countries, which increasingly depend on imported wheat to meet income-driven growth in domestic wheat demand. In the last three years, China has almost disappeared from world wheat markets. This changes during the baseline period, with China accounting for a quarter of the expansion in world wheat trade. Chinese imports rise from 1 mmt in 2000/01 to 5.65 mmt in 2010/11. Although Chinese imports remain far below their historical levels, China establishes itself again as a major buyer on world wheat markets. High-income East Asian countries, which include South Korea, Taiwan, Hong Kong, and Singapore, depend heavily on imported wheat to meet their increasing domestic demand. Imports in this region increase 19.26 percent over the outlook period, continuously rising from 5.08 mmt in 2000/01 to 6.05 mmt in 2010/11.

India has been an unpredictable player on international wheat markets for the last decade, alternating as an importer or exporter of wheat depending on domestic production. India’s exports reach approximately 1 mmt in 2000/01 and then decline steadily, as domestic consumption rises faster than domestic supply. During the second half of the projection period, India becomes a net importer of wheat, with imports reaching 2.2 mmt by the end of the baseline.

Brazil increases its imports by 8.3 percent over the baseline, mainly because of Argentina’s competitive advantage within MERCOSUR. Low-cost production in Argentina tends to restrict growth in Brazilian wheat area, which is almost flat during the next decade. Rapidly increasing domestic demand and continued trade liberalization contribute to the more than 30 percent increase in Mexico’s wheat imports over the baseline. Mexican wheat imports peak at nearly 2.5 mmt by 2010/11.
Droughts in two consecutive years trigger a collapse in Iranian wheat production and force Iran to buy significant quantities of wheat on the world market to meet domestic needs. With weather back to normal conditions, Iranian wheat imports fall nearly 3 mmt in 2001/02 as compared to 2000/01 levels. However, beyond this date, Iran imports increase steadily to nearly 6 mmt, as consumption growth outpaces increases in production.

On the export side, the EU benefits the most from the expansion of world wheat trade. Despite a gradual appreciation of the euro, the EU wheat price remains below the world price, allowing EU exports to be competitive on world wheat markets without subsidies. During the next decade, EU wheat production rises steadily at an average annual rate of 1.9 percent. The EU is expected to expand its exports by nearly 12 mmt and capture more than half of the expansion in world wheat trade.

Other traditional wheat exporters also benefit from the expansion of world wheat trade. Though exports rise slowly, Canada remains the second-largest wheat exporter until 2007/08, when the EU overtakes Canada and moves into the second-place position behind the United States. Australian wheat production grows 28.6 percent over the baseline, the highest rate among major producers. This growth, coupled with a slow increase in domestic consumption, enables Australia to increase its exports more than 3.4 mmt over the outlook period. With exports growing at a slightly faster pace than world trade, Australia increases its market share to between 16 and 17 percent of world wheat market. Argentina, the fourth largest wheat exporter, expands its exports by 2.1 mmt over the outlook period, exporting more than 14 mmt in 2010/11. In the context of expanding world wheat trade, U.S. wheat exports grow slower than other competitors. U.S. exports rise at an average annual rate of less than 0.5 percent, peaking at 29.42 mmt in 2010/11. As a result, U.S. market share drops from 31 percent to 27 percent by the end of the outlook period.

**Coarse Grains**

During the last five years, coarse grain markets have experienced a sharp decrease in prices in response to weak import demand, along with relatively high yields. As a result, world coarse grain area lost more than 15.4 mha between 1996/97 and 1999/00. The response to the decline in prices has been the strongest for barley, which accounts for nearly two-thirds of the decrease in world coarse grain area. During the same period, the decline in world corn area roughly totaled only 2 mha, despite the fact that world corn prices were 48 percent lower in 1999/00 than in 1995/96. In 2000/01, coarse grain area looses another 3 mha compared to 1999/00. Thus, world coarse grain production decreases nearly 18 mmt this year.

From 2001/02 onward, this declining trend in coarse grain area is reversed, as feed grain demand recovers in major importing countries. World coarse grain area grows slowly over the next decade, adding another 3.8 mha, with increases in corn and barley area partially offset by a decrease in sorghum area. Despite this meager 0.16 percent annual growth rate, coarse grain production grows by 137 mmt (an increase of nearly 18 percent) during the baseline, with the bulk of the growth resulting from yield growth in corn production. Recovery in Asian countries and a corresponding increase in livestock production contribute to the 1.35 percent annual growth in world coarse grain consumption over the next decade. Driven by rising demand, coarse grain prices rise over 2 percent annually during the baseline.

World coarse grain trade is projected to expand by more than 27 percent, growing 2.4 percent annually from 2000/01 to 2010/11. World corn trade grows the fastest among coarse grains, expanding more than 30 percent over the next decade. An additional 20.6 mmt, representing more than 80 percent of the expansion of world coarse grain trade, are brought to international corn markets during the baseline. More than 90 percent of the additional shipments are destined for developing countries to meet sharply increasing feed demand. The additional demand for corn imports comes primarily from Asian countries. Within Asia, the most important importers of corn are Japan, South Korea, and Taiwan. Japan, whose corn imports ranged from 16 to 16.4 mmt in the last five years, remains the largest Asian corn importer, absorbing nearly 24 percent of world corn trade in 2000/01. Lower feed demand, due to the decline in Japanese livestock production and trade liberalization measures, results in a flat to slightly declining trend in Japanese corn imports over the baseline. South Korea is the second largest Asian corn importer. South Korean corn imports are expected to increase from 8 to 9.8 mmt during the baseline, enabling South Korea to meet domestic feed demand. Finally, growth in Taiwanese corn imports is steady but slow, with imports increasing from 5.1 to 6.1 mmt.
Livestock recovery and rebuilding of hog inventories contribute to an increase in feed demand in this country, but this is partially offset by a strengthening of environmental restrictions.

Recently, China re-established itself as a significant corn exporter on international markets, with exports reaching nearly 10 mmt in 1999/00. However, in the mid to long run, China is an important potential market for corn. As soon as this year, Chinese corn exports are expected to be less than half of the 1999/00 level. With rising domestic feed use continuing to sap excess supplies, China increasingly depends on imported corn during the baseline. Consequently, China is expected to progressively disappear from the corn export market and become a net importer by 2005/06. By the end of the outlook period, Chinese corn imports total 6.9 mmt.

Latin American countries represent the second largest growth market behind Asia. Mexico is the largest corn importer in this region, importing 6.3 mmt in 2000/01. Over the outlook period, Mexican corn imports grow nearly 2 percent annually, due to steadily increasing feed use and in response to a gradual reduction of over-quota tariff rates under the North American Free Trade Agreement (NAFTA). By the end of the projection period, Mexico is importing 7.6 mmt.

On the export side, Argentina appears to be the main competitor to the United States, but its ability to secure a large part of the increase in world corn trade is somewhat limited. As almost no area shifts into corn production during the baseline, corn output grows 2.3 mmt through yield increases alone. Increases in feed use, due to expansion of domestic livestock production, also reduce Argentina’s potential to export large quantities of corn. Nevertheless, Argentina expands its exports from 8.5 to 10 mmt during the baseline period, but its market share drops from 12.6 to 11.4 percent. In this context, the United States benefits the most from the expansion of world corn trade. The U.S. captures more than 90 percent of the increase in corn trade, with the U.S. market share rising from 79 to 82 percent.

Barley trade expands 2.4 mmt over the baseline, growing an average 1.3 percent annually (less than half the pace of corn trade expansion). More than 70 percent of this increase occurs in China, to meet increasing brewing industry demand, and in Saudi Arabia, to meet higher demand for feed use. The EU captures most of the growth in barley trade, expanding its exports to more than 13 mmt by 2010/11. The EU’s barley export share increases from 61 to 66 percent, whereas Australian and Canadian market shares decline slightly. World sorghum trade is projected to increase by almost 2 mmt over the next decade, primarily because of growth in Mexican imports, which are partially offset by a decline in Japanese imports. The majority of the increase in sorghum imports is satisfied by an expansion of U.S. exports, from 5.1 to 6.5 mmt over the next decade.

**Rice**

Rice issues are politically very sensitive in Asian countries, where the bulk of the world’s rice production occurs, and achieving rice self-sufficiency is touted as an important goal by many Asian governments. As a result, the world rice market is strikingly thin compared to markets for other grains, with roughly 5 percent of the total world production traded on international markets. Recent fluctuations in world trade also show how responsive the world rice market can be. In 1997/98, world rice trade peaked at 22.7 mmt, increasing by 6.2 mmt in one year in response to droughts in Indonesia and the Philippines. Between 1997/98 and 1999/00, world rice trade has decreased approximately 3 mmt and rice prices have fallen nearly 24 percent.

In 2000/01, continued urbanization and competition from other crops lead to a 2.3 mha reduction in world rice area as compared to 1999/00 levels. As a consequence, world rice production is 400.6 mmt in 2000/01, or 4.4 mmt lower than last year. In the next decade, world rice area loses another 2.4 mha. Nevertheless, in the long run, steadily rising yields offset the decrease in rice area, allowing rice production to reach 437.3 mmt by 2010/11.

World rice consumption rises at nearly the same rate as production over the baseline. However, rice consumption patterns have significantly changed in recent years. The growth in rice consumption mainly occurs in nontraditional rice-consuming countries, such as the U.S., the EU, and Canada. Conversely, per capita rice consumption in Asian countries declines as a consequence of urbanization and income growth and as Asian consumers tend to favor substitution of wheat for rice in their diets. Over the next decade, world rice consumption increases 36.1 mmt, or nearly 9 percent. In the same time period, world rice trade rises 6.4 mmt, or nearly 33 percent. Aided by the decline
in domestic consumption per person, excess supplies in Asian countries expand, allowing Asia to capture most of the increase in rice trade.

Indonesia and the Philippines are the most important importers on world rice markets. Indonesia remains the world’s largest importer during the baseline, with imports accounting for slightly less than 10 percent of world rice trade. Indonesia becomes increasingly dependent on imported rice to meet its domestic needs, importing an additional 700 tmt over the outlook period. The Philippines increases its imports by approximately 1 mmt, nearly doubling its share of world rice trade and accounting for nearly one-sixth of the trade expansion. As for Japan and South Korea, WTO commitments contribute to a steady decline in rice area and weak growth yields. Consequently, rice production falls 4 percent in Japan and 7.3 percent in South Korea. Japanese imports reach 600 tmt in 2010/11, as compared to 150 tmt in 2000/01.

Thailand is the world’s largest rice exporter. Thai rice production grows 10.6 percent over the baseline, mostly through yield increases. Rising production and relatively flat consumption enables Thai exports to grow 27.4 percent over the next decade, capturing 27 percent of the increase in world rice trade. Besides Thailand, Vietnam and India secure most of the remaining increase in rice trade, seizing respectively 27.2 and 34.6 percent of the trade expansion over the outlook period. Despite a slight decline in area, Indian rice production grows an average of 1.2 percent, enabling India to double its market share over the baseline and to become the world’s third largest exporter by 2008/09. Driven by yield increases, Vietnamese production grows at an average rate of nearly 1.8 percent a year. Vietnamese rice exports reach 5.5 mmt by 2010/11, increasing 1.75 mmt over the baseline.

Over the last three years, China has established itself as a significant exporter on the world rice market. In 2000/01, Chinese rice exports reach nearly 3 mmt. Relatively flat consumption during the early years of the outlook period, along with increasing yields, allows China’s market share to peak at 15.75 percent in 2003/04. However, over the long run, as Chinese rice consumption outpaces production, China’s market share drops to nearly 11 percent in 2010/11, with Chinese exports falling just below their 2000/01 levels.

Besides Asian players, Argentina and Uruguay take advantage of duty-free access to the rice market in Brazil and other MERCOSUR countries to increase their exports by, respectively, 620 and 330 tmt by 2010/11. U.S. rice consumption grows nearly 2.1 percent annually over the next decade. With both area and yield increases in the early years of the baseline, growth in domestic production is able to meet domestic needs and allow increases in U.S. exports until 2003/04. In the latter half of the decade, however, U.S. rice exports decline, falling to 2 mmt by 2010/11.

Oilseeds

After reaching record levels in 1997, average oilseed prices have declined by roughly 40 percent. As a result of reductions in sunflower and rapeseed area, world oilseed area in 2000/01 decreases to 127 mha, roughly 1 percent below the 1999/00 level. In 2001/02, continued weak oilseed prices restrict the expansion of oilseed area in several major producing countries.

Total oilseed area is projected to increase by 13 mha during the baseline, with most of the growth occurring after oilseed prices substantially recover in 2004/05. More than half of the growth in total area occurs in the South American soybean sector. Total oilseed production reaches 286 mmt in 2010/11, with the increase driven by growth in both area and yields. Oilseed crush increases 18 percent to meet the rising demand for oilseed meal and oil. Strong income growth in developing countries increases the demand for vegetable oils and livestock products, which increases the demand for oilseed oils and meals. Each importing country’s domestic policies and crushing capacity dictate whether oilseeds or oilseed products are imported. Taking these factors into account, world oilseed trade is projected to increase by 41 percent, while meal and oil trade increases 10 and 13 percent, respectively.

Soybean area in 2000/01 increases 4 percent compared to last year, with the largest growth occurring in China and Argentina. Soybean area in the United States expands in response to the loan rate, which acts as the floor price and encourages soybean production, and to higher fertilizer prices, which shifts plantings in the Corn Belt away from corn and into soybeans.
Soybeans account for the bulk of the growth in import demand, followed by rapeseed and sunflower seed. The majority of the increase in soybean imports occurs in China and the EU. China emerges as the second largest importer of soybeans because of strong per capita oil demand, demand for meal from the livestock sector, and Chinese grain policies. Chinese soybean net imports more than double over the baseline, rising from 7.6 mmt in 2000/01 to 16.3 mmt in 2010/11. The EU, the largest importer of soybeans in the world, increases its imports by 1.5 mmt over the baseline. Brazil captures 51 percent of the trade expansion, and the U.S. and Argentina will split the remaining growth evenly. Rapeseed trade grows at an annual rate of about 1 percent to 5.2 mmt by 2010/11. Canada dominates the export market for rapeseed, while China and Japan account for more than 90 percent of rapeseed imports.

Oilseed meal consumption increases sharply from 139 mmt to nearly 169 mmt by the end of the projection period. The highest absolute increase is expected in soy meal consumption, which grows by 20 mmt. Soy meal also accounts for the majority of the growth in oilseed meal trade. The EU is the largest importer of soy meal, and its imports increase from 15 mmt in 2000/01 to 16.5 mmt in 2010/11. Apart from the EU, other growth markets for soy meal include Eastern Europe, South Korea, and Canada. With strong growth in soybean imports and increased domestic crush, China and Taiwan become small net exporters of soybean meal by the end of the projection period.

Increasing incomes in less-developed countries play a crucial role in the more than 15 mmt increase in vegetable oil consumption by 2010/11. On a per capita basis, world vegetable oil consumption is expected to increase by an average of 0.26 kg per person annually over the baseline. Palm oil consumption increases 24 percent, while sunflower oil and soybean oil consumption increase 22 percent and 18 percent, respectively. Chinese soy oil net imports increase from 0.60 mmt to 1.18 mmt, making China the largest soybean oil importer. India becomes the second largest soybean oil importer, with its net imports reaching 1.10 mmt. India is the largest importer of rapeseed oil, and continued growth in population and income increases its imports from 370 tmt in 1999/00 to 803 tmt by 2010/11.

Livestock and Poultry

The general outlook for the world meat sector in the next decade is good. Consumption, production, and trade in meat rise, with world meat prices showing moderate strength. On the demand side, consumption of meat products increases as most countries in the world post reasonable income growth, with Asian economies growing the fastest at 5.6 to 6.3 percent annually. Meanwhile, meat production capacity continues to expand. Structural transformation into larger-sized operations leads to the adoption of technological improvements, advanced management practices, and product innovation. Moreover, several policy and institutional changes around the globe are improving the functioning of world markets. A list of examples includes market-oriented domestic policy reforms, such as the Agenda-2000 reforms in the European Union; trade liberalizations in South Korea, Mexico, and Europe (including zero-for-zero agreements); and favorable institutional arrangements, such as the EU-U.S. Veterinary Equivalency Agreement.

Per capita consumption of beef, pork, and poultry increases 4.6 kilograms between 2000 and 2010, with Asia posting the largest increase, followed by the Americas, the Former Soviet Union, and Eastern Europe. Higher meat demand exerts upward pressure on meat prices, resulting in a moderate strengthening of prices. The beef price increases 3.27 percent in the next three years. Pork prices cycle throughout the baseline, with prices at successive peaks increasing 0.5 to 2.1 percent from peak to peak. The poultry price has an average increase of 0.36 percent annually throughout the decade. Responding to the higher meat prices, world meat production rises 17 percent during the projection period, amounting to an increase of 27.39 mmt. Broiler production shows the fastest growth, followed by pork and beef production. Because meat consumption growth occurs mostly in Asia—particularly in Japan, South Korea, Taiwan, Indonesia, and the Philippines, all traditionally meat deficit countries—meat trade satisfies some of the rising demand, which increases by 2.61 million metric tons, or 27.81 percent, over the next decade. The increase in meat trade is dominated by pork trade, the leading meat in Asia, followed by beef, the leading meat in the Americas, and then poultry.

Low-cost producers from the Americas capture a growing share of international meat trade throughout the baseline. With abundant feed supplies, advanced production technologies, adequate transport and storage infrastructure, and exceptional sanitary and food safety controls, the U.S. and Canada increase their share of the international meat market. The U.S. alone captures 42 percent of the growth in meat trade during the decade. Other gainers include Brazil
The BSE Crisis in Europe

BSE was first diagnosed in the U.K. in 1986. BSE is a disease of the brain in cattle caused by an infectious protein called a "prion", and has been transmitted primarily through ingestion of feedstuffs containing infected meat and bone meal. As a consequence of the practice of feeding of mammalian protein (such as meat and bone meal) to cattle, BSE reached epidemic proportions in the U.K. in 1992 and 1993, with reported confirmed cases of 37,280 and 35,090, respectively. To date, the U.K. has reported 177,780 BSE cases on 35,156 farms.

Since the discovery of BSE, consumer fears about the safety of European beef have affected European meat consumption twice in crisis proportions. The first instance occurred in March of 1996 following the announcement from the Ministry of Agriculture, Forestry, and Fisheries’ (MAFF) BSE Advisory Committee that, “although there is no direct evidence of a link, on current data and in the absence of any credible alternative the most likely explanation at present is that cases of variant Creutzfeldt-Jackob Disease (vCJD) are linked to exposure to BSE before the introduction of the Specified Bovine Offal (SBO) ban in 1989.” After the announcement, per capita consumption in the U.K. declined 16 percent. Also, as BSE cases were reported in other European countries, beef per capita consumption in Portugal, Ireland, and France decreased by 22, 12, and 8 percent, respectively. Countries with no BSE cases during this period include Germany, Greece, Italy, Netherlands, and Spain. Nevertheless, consumers in these countries also reduced beef consumption by 2 to 7 percent. Only Austria, Belgium-Luxemburg, Denmark, Finland, and Sweden increased beef consumption during this period, by 2 to 6 percent.

International markets also reacted to the MAFF announcement, and exports from the U.K. and other affected member states were banned within the EU and by many beef-importing countries outside Europe. World net beef trade in 1996 dropped by 1.6 percent, and EU average beef exports for 1995-1996 were 12.86 percent lower compared to the average of the two previous years. However, a large part of the reduction in EU beef exports was a result of the restrictions placed on the EU’s subsidized exports by the General Agreement on Tariffs and Trade (GATT).

To restore consumer confidence in the safety of beef products, the EU initiated several measures, including implementing an identification and registration system for cattle, banning the use of mammalian meat and bone meal in animal feed, removing beef from cattle slaughtered after the age of 30 months from the food chain (OTMS), and removing Specified Risk Materials that potentially harbor detectable BSE infectivity from the human food and animal feed chain. Per capita beef consumption in the EU returned to the pre-crisis level as early as 1999. New BSE cases in the U.K. dropped from the peak of 277 per 1,000 animals to only 24. Beef exports were at the maximum subsidized level allowed by GATT.

The second BSE crisis occurred in 2000, just as the EU beef sector was moving out from under the shadow of the first BSE crisis. The EU began implementing Agenda 2000 reforms to further balance the beef sector and make EU beef more competitive on both domestic and international meat markets. But these efforts were interrupted in late October 2000 by an increasing number of BSE cases discovered in continental Europe. In contrast to the decline in BSE cases in the U.K., cases in other member states have increased an average of 77 percent since 1996, particularly in France, Ireland, and Portugal. Although the rate of infection is negligible at 0.66 cases per 1,000 animals compared to U.K.’s 297 cases at its peak, beef consumption has declined significantly throughout most of the EU. The credibility of public announcements that EU beef is safe to consume received damaging blows with each new case of BSE reported, particularly cases reported in countries with no prior incidence of BSE. Moreover, violations of safety measures reported in popular media fed consumer fears. In France, beef consumption declined by 47 percent in December 2000, and even with a partial recovery by mid February 2001, beef consumption remains 24 percent below the level in February 2000.

On December 12, 2000, the EU Beef Management Committee ratified a series of measures designed to further ensure the safety of beef for consumers and provide support for the beef market. The measures included more flexible public intervention; testing and purchase for destruction until June 30, 2001, for cattle over 30 months old; continuation of the OTMS in the U.K.; and an advance on premiums from 60 to 80 percent. The Purchase for Destruction Scheme is financed 70 percent by the EU Commission and 30 percent by member states, while testing is financed equally by the Commission and member states.

Although the FAPRI outlook was generated while the BSE crisis in Europe was still unfolding, the outlook does incorporate the impacts of recent events in its EU projections. The outlook assumes that EU beef consumption declines 6.1 percent (from 1999 levels) in 2000 and declines an additional 8.3 percent in 2001. Beef consumption in the EU is assumed to recover slightly in the middle of the decade as the BSE scare wanes, and then it continues to its long-term declining trend. Beef exports stay at 68 percent of the GATT limit from 2000 to 2005 and then climb to 83 percent in the remainder of the decade. On the supply side, the Purchase for Destruction is assumed to remain in effect from 2000 to 2004, while the OTMS in the U.K. continues throughout the baseline. Production recovers slightly following the termination of the Purchase for Destruction scheme, but a decline in dairy cattle inventories as a result of rising productivity causes beef production to decline toward the end of the baseline. With these shocks and adjustments in the beef sector, the beef price drops for three consecutive years, with the greatest decline in 2001 at 10.7 percent. Beef prices recover in 2004-2005 before declining an average of 1.95 percent annually until 2010.
and Argentina. The Brazilian currency devalues 5.6 percent annually, improving its competitive edge relative to other meat exporting countries. However, Brazil’s export growth is constrained by sanitary considerations. Argentina, on the other hand, has been declared FMD-free and is able to penetrate new markets, especially the lucrative markets in Asia, which allows Argentina to regain international market share that was lost in the late 1990s.

The opening of this decade was characterized by disruptions in world meat markets caused by sanitary issues. The most recent and much publicized incident is the BSE crisis in Europe that started late in 2000 and is still developing. As a result, Europe’s share of international meat trade has declined, as major importers have imposed restrictions or total bans on importation of EU beef products. In the early part of 2000, FMD outbreaks in Japan and South Korea closed the Japanese pork import market to pork imports from South Korea, as did the FMD outbreak in Taiwan in 1997. Similarly, cases of FMD reported in Brazil and Argentina were a setback to the anticipated entry of meat products from South America into lucrative markets in North America, Europe, and Asia.

**Beef**

The brightest sector in the world meat outlook is the beef market. A confluence of demand and supply factors in both the domestic and international markets exerts upward pressure on beef prices over the next three years, prompting them to rise 3.27 percent annually. The U.S. price for fed steers peaks at $76.64 per cwt in 2003. On the domestic side, the U.S. cattle inventories build during the first five years of the baseline. Moreover, beef exports from the EU dropped by 30 percent in 2000 and drop another 15 percent in 2001, resulting in a decrease in the excess supply of beef on world markets. The expansionary phase of the cattle cycle in the U.S. begins in 2002, and the U.S. becomes a net exporter of beef in 2006. U.S. beef net exports are only 22 tmt in 2006, but they grow rapidly to 259 tmt by 2008.

Income and population growth, on the one hand, and various production constraints, on the other, enable consumption to rise faster than production in many countries, causing these countries to satisfy their excess demand with low-cost imports. For example, with an aging farm population and high production costs, production of all meats in Japan has been declining. In particular, beef production has been declining since 1995 and continues to decline in the projection period at a rate of 0.80 percent annually. In contrast, consumption of beef continues to grow 0.58 percent annually. The growing supply deficit is met by beef imports, which grow 1.03 percent annually to reach 1.11 mmt in 2010. By the end of the baseline, beef imports account for 69 percent of Japanese beef consumption. A similar pattern is exhibited in South Korea, especially following the liberalization of Korea’s beef import market in 2001. Although Korea’s quota has not been binding in recent years because of the financial crisis in 1997-1998, large impacts on beef imports are expected in the short-run as a result of the recent ruling by the WTO that South Korea’s discriminatory beef retail distribution system is inconsistent with WTO rules. In the projection period, beef production in South Korea declines 2.95 percent annually, while consumption rises 1.38 percent each year, causing beef imports to balloon to 436 tmt (69 percent of consumption) in 2010. Taiwan’s beef consumption has always been supplied primarily by imports, accounting for 96 percent of consumption. With growing beef consumption, Taiwan’s imports increase 3.47 percent annually over the baseline.

Plagued by low profitability and credit problems, Mexico’s cattle inventory has been shrinking at an annual rate of 4.2 percent since its most recent peak at 30.7 million head in 1994. Whereas income and population growth drives an expansion of beef demand in the near term, it takes four years for the cattle sector to recover, causing beef net imports to increase 40 percent between 2000 and 2004. As the cattle sector recovers, net imports at the end of the decade are only 11.89 percent above the level in 2000. Strong demand for feeder cattle in the U.S. prompts an expansion in Mexico’s live cattle exports, although not at the high rates observed in the late 1990s. In 2010, Mexico’s live cattle exports reach 1.33 million head.

At the height of the macroeconomic crisis in 1998, Russia’s beef imports dropped 22 percent. Food aid from the EU and the U.S. allowed Russia to increase its beef imports by 45 percent the following year. However, absent the food aid, imports declined again by 36 percent in 2000. In the next decade, Russia’s beef imports increase 55 percent, from 445 tmt in 2000 to 688 tmt in 2007. In the first half of the baseline, cattle stock and production in Russia continue to decline 1.39 percent annually, while consumption recovers and grows an average of 0.63 percent each year. Slight
recovery in production at the end of the decade dampens imports to 669 tmt in 2010. A similar pattern occurs in the CEECs, namely, an increasing beef deficit in the region as a result of a faster and earlier recovery in beef consumption at an annual rate of 1.37 percent during the first half of the decade with production not turning around until 2007.

Canada is shifting its export mix from live cattle to beef products. With its additional slaughter capacity, Canada is retaining more cattle for domestic slaughter, cutting the average level of its live cattle exports to the United States in half compared to the peak level of 1.15 million head in 1996. At the same time, Canada’s beef exports jumped by 15 percent between 1999 and 2000, penetrating the Mexican beef import market as a substitute for certain types of beef exported from the United States that are currently subject to anti-dumping duties levied by the Mexican government. Between 2000 and 2007, Canada’s beef exports grow another 15 percent, as it establishes an increasing presence in some Asian beef import markets. Canada’s share of world beef trade doubles from 4 to 8 percent over the next decade.

Australia exploits the opportunity created by the rising world price of beef to increase its exports of both live cattle and beef in the first half of next decade. Beef exports increase 2.17 percent annually, peaking at 1.38 mmt in 2006. Australian beef exports decline after 2006, but live cattle exports continue to grow 4.42 percent annually, reaching 1.34 million head in 2010. The Philippines and Indonesia are the primary destinations for Australian live cattle exports. With rising incomes and population, demand for both beef and live cattle have increased in Indonesia and the Philippines. Both countries have encouraged growth in their feedlot-fattening sectors, despite the absence of a viable cow-calf industry to support feeding operations. In the Philippines, for example, live feeder cattle imports are only charged a 3 percent duty, while a 30 percent levy is applied to beef imports within the quota limits and a 40 to 45 percent levy is charged for over-quota imports. Moreover, live cattle imports are not counted against the TRQ. Australia’s beef export market share increases from 37 to 38 percent before declining to 34 percent at the end of the baseline.

Similarly, the recovery of New Zealand’s cattle sector is timely, allowing producers to benefit from rising demand and prices on international markets. A succession of severe droughts reduced beef production by 16 percent between 1997 and 1999. New Zealand ranchers retain more dairy calves to rebuild beef herds early in the baseline, allowing production to grow 2.74 percent, which exceeds the 2.07 percent increase in consumption. New Zealand is able to increase its beef exports by 30 percent over the next decade, keeping its share of the export market at around 15 to 16 percent.

After suffering a setback in early 2000 due to some cases of FMD, primarily in illegally imported cattle, South American beef producers rebounded quickly. Argentina’s rapid response to the incidences of FMD enabled it to retain its FMD-free status from the OIE. FMD-free status removes restrictions against Argentine exports of both fresh-chilled and processed beef to Europe, North America, and Asia. Argentina’s beef sector benefits from the macroeconomic policy, which has stabilized the Argentine currency and lowered inflation. Moreover, beef producers receive support in the form of an interest cost subsidy of 2 percent, and exporters receive a tax rebate of 2.7 to 12 percent. Consequently, Argentina’s beef exports increase 61 percent over the baseline, reaching 566 tmt in 2010. Argentina’s share of beef trade returns to its peak level of 13 percent reached in the 1990s. Brazil, on the other hand, has made some progress in improving its production technology, infrastructure, and marketing. Brazil’s beef exports increase 14 percent in the next decade, doubling its share of beef trade from 10 to 20 percent. However, sanitary issues and domestic consumption growth of 1.89 percent annually limit Brazil’s export potential.

The combination of Agenda 2000 reforms and the termination of all support schemes associated with the 1996 BSE crisis were expected to bring the EU beef sector into balance in the next decade. The beef intervention price is reduced by 20 percent under Agenda 2000, and public intervention purchases are replaced with private storage aid at the end of 2002. The calf-processing scheme was terminated in 1999, and the Over Thirty Month Scheme (OTMS) in the United Kingdom was scheduled for termination in 2001. However, the more widespread nature of recent BSE cases reported in the EU has disrupted the beef market, repeating the public concern witnessed in 1995-1996. Per capita beef consumption in the EU declines by 15 percent between 1999 and 2002, recovers from 2003 to 2005, and then resumes the gradual decline it exhibited in the early 1990s. Similarly, beef production drops 13 percent between 1999 and 2002 as a consequence of the indefinite extension of the OTMS in the United Kingdom and the introduction of the “Purchase
Overview: FAPRI 2001 Agricultural Outlook / 13

for Destruction Scheme” in the rest of the EU. There is a slight recovery in EU beef production from 2003 to 2005, after which production gradually declines as dairy cattle numbers are diminished by long-run productivity growth. Flexible public intervention and continued export restitution support the EU beef market throughout the baseline. In 2000, EU beef exports dropped 30 percent. In the last quarter of 2000, major beef importers—such as Egypt, Japan, and Russia—imposed restrictions or a complete ban on beef imports from BSE-infected countries in the EU. Exports decline an additional 15 percent in 2001 before recovering slightly beginning in 2003.

**Pork**

The transformation of the pork sector in many countries has expanded productive capacity and improved productivity. However, rising incomes in countries that are not major pork-producing regions increases the demand for pork imports and boosts world trade by 39 percent, an increase of 872 tmt by 2010. World pork prices cycle slightly upward over the baseline, reaching a maximum of $45.88 per cwt in 2008. Prices at the bottom of the cycle also increase over the baseline. In the next decade, pork prices do not fall below $36 per cwt, the break-even price reported by USDA, except in 2002.

Japan remains the largest pork importer in the world, with net imports reaching 1 mmt in 2010. However, the 1.36 percent annual growth in imports in the next decade is much weaker than the 6.58 percent growth achieved in the 1990s. The primary reason for the slowdown in Japanese pork imports is that Japan has introduced a form of deficiency payments program that insulates Japanese pork producers from unfavorable price movements in the wholesale carcass market. As a result, production declines a scant 0.28 percent annually compared to the 2.17 percent decline in the 1990s. Despite the policy change, Japan’s pork imports increase 14 percent over the baseline.

With production 29 percent lower than its pre-FMD level, Taiwan imports non-muscle and variety meats to satisfy its domestic requirements. Domestic pork consumption increases 1.29 percent annually compared to the 0.84 percent increase in production, raising Taiwan’s imports of cheap muscle meats. Taiwan’s total pork imports increase 7.48 percent annually. South Korea gained significant share of the Japanese pork import market after the ban on imports from Taiwan was implemented in 1997. However, FMD cases in pork-producing regions have restricted South Korea’s exports to Japan. With more pork remaining on domestic markets, South Korea’s pork imports decline 11 percent between 2000 and 2010. Hong Kong gradually replaces imports of live, slaughter-ready swine with pork imports. Swine imports decline 15 percent compared to the 1997 level, while pork imports expand by 25 percent in the next decade.

Mexico shows strong growth in pork demand, increasing 4.06 percent annually in response to improved consumer purchasing ability and growing population. Domestic pork production is constrained by poor infrastructure and distribution to 2.97 percent annual growth. Mexican pork imports expand from 95 tmt in 2000 to 285 tmt in 2010.

The shift toward smaller production units and the limited availability of feed grains have slowed recovery in the Russian pork sector in the short run. Infrastructure and institutional constraints darken the long-term prospects for recovery. Production increases only 1 percent annually during the baseline. However, modest economic growth boosts consumption by 1.73 percent annually, causing net imports to increase from 299 tmt in 2000 to 477 tmt in 2010.

Low-cost producers in North America are in the best position to capture the growth in the international pork market. In particular, the U.S. continues to build up its hog inventory, approaching the 1998 level of 55.3 million head in 2001 and pushing prices to their lowest level for the next decade in 2002. By keeping a tight reign on production costs and improving productivity, efficient producers are able to weather the downturn in prices, and at the end of the decade, hog inventories are 3.58 percent larger. With production annual growth of 1.51 percent exceeding consumption growth of 1.17 percent, net exports from the U.S. increase 6.10 percent annually, allowing the U.S. to double its market share from 7.7 percent to 14.4 percent.

Canada has complemented its abundant feed resources and improved production technology with additional investments in hog production facilities and meat processing plants and aggressive export marketing in the Asian market. Canadian pork production grows 2.80 percent annually, exceeding the more modest annual increase in consumption of 1.75 percent. Canada’s net exports of pork increase from 680 tmt in 2000 to 1,019 tmt in 2010, making
Canada is the largest single-country pork exporter and affording it 38 percent of the international market. Expansion of the processing sector is one of the engines propelling this growth. Canada has expanded its meatpacking capacity, reducing live swine exports to the U.S. by 20 percent compared to the peak level of 4.14 million head in 1999. Moreover, Canadian processors seek to differentiate their products by using better coordination mechanisms that ensure quality. They also have shown flexibility in segregating U.S. and Canadian pigs for processing in response to Australia’s sanitary concerns over pork originating from U.S. swine.

The EU has been the largest pork exporter in the world, with a market share of 46.5 percent. The EU pork market is mature and balanced, with consumption and production evolving at almost the same annual rate of 0.68 percent. However, the disruption of the beef market due to the BSE scare is spilling over into the pork sector. As consumers shift away from beef to other meats, per capita pork consumption increases by 1.31 percent in 2001, reducing the EU’s exportable surplus by 11 percent. With strengthened prices, production increases and allows the EU to export more in the next two years. In the medium term, beef consumption adjusts toward normal levels at a time when swine production is high, prompting a decline in pork prices and a reduction in production and net exports. However, the low feed prices that result from the Agenda 2000 reforms allow the EU to increase exports in the outer period, reaching 1.27 mmt in 2010. Also, the EU signed a zero-for-zero agreement with Central and Eastern European Countries. Recovery in the pork sector of the CEECs toward the end of the projection period enables the region to maintain its net export position.

Driven by rising demand in both the domestic and export markets, pork production in Brazil grows an average of 2.28 percent annually. Brazil has encouraged increased investment in swine production in the Central-West region through fiscal incentives. This area is close to feed grain sources. Brazil is aggressively marketing its agricultural exports through market promotions and is penetrating new markets such as Russia. With domestic consumption growing 2.02 percent annually, Brazil is able to increase its exports from 84 tmt in 2000 to 163 tmt in 2010, representing a doubling of its market share from 3 to 6 percent.

**Poultry**

In most countries, poultry consumption grows faster than consumption of other meats over the next decade. In a number of countries, chicken consumption approaches or sometimes exceeds consumption of traditional leading meat products, such as beef in the Americas or pork in Europe. Half of the growth in per capita meat consumption in the next decade is accounted for by the increase in poultry consumption. This growth is driven by the fact that poultry prices are often lower than other meat prices and by the perception that poultry meat is healthier than other meats. Made possible by ready availability of advanced production technology, world poultry production responds to the growing demand by increasing 27 percent, and world poultry trade grows 20 percent. The rapid growth in world poultry production alleviates pressure on world poultry prices, which show a sustained annual increase of only 0.36 percent throughout the next decade.

China and Russia account for 37 percent of world broiler imports. Whereas U.S. consumers prefer chicken parts with white meat (for example, chicken breast), Chinese consumers prefer the lower-cost cuts with dark meat, such as the back, neck, and feet. Driven by the complementary nature of demand for chicken parts in China and the United States, China’s chicken imports grow 1.10 percent annually, from 770 tmt in 2000 to 859 tmt in 2010. Russia’s poultry imports increase 3.36 percent in 2001. But net imports decline in the medium term, as improvements in production infrastructure boost domestic production, especially in larger broiler operations. Russia’s net imports of broiler meat total 901 tmt in 2010.

Japan and Hong Kong account for an additional 37 percent of world broiler imports. Production of broilers in Japan continues to decline while consumption expands, causing net imports to rise 18 percent in the next decade. Hong Kong’s demand for chicken meat is largely met by imports. Also, imports into Hong Kong are often re-exported to the Mainland. Total broiler imports into Hong Kong increase 17 percent over the baseline.

With similar patterns of macroeconomic and population growth driving consumption, the combined net imports of Indonesia, Philippines, and South Korea increase from 81 tmt in 2000 to 173 tmt in 2010. On the other hand, Mexico’s broiler imports are stable to slightly declining, with the average level of imports 4 percent lower than that
in 1999. Broiler imports in 2000 were higher than normal, as additional supplies were needed after the Newcastle disease outbreak.

The U.S. continues to show growth in broiler production, consumption, and trade over the next decade. With abundant feed grains, efficient production, and adequate transport and storage infrastructure, the United States increases its exports 1.14 percent annually. However, strong competition from Brazil reduces the U.S. share of broiler trade slightly in the second half of the decade, from 59 to 58 percent. Driven by strong domestic and export demand, Brazil’s poultry sector makes significant gains in the next decade. Fiscal incentives and subsidies from local governments attract new investments in broiler production near the grain surplus Central-West regions. Brazilian net exports of broiler meat grow 3.68 percent annually, as production growth of 2.52 percent outpaces consumption growth of 2.33 percent. Although Argentina imposed a minimum import price on poultry imports from Brazil, the steady devaluation of the Brazilian currency and renewed access to the Chinese market following the Newcastle outbreak raise its share of the export market from 18 to 26 percent.

The EU share of the international poultry market declines from 15 to 9 percent. During the first three years of the baseline, a greater proportion of poultry production is retained for the domestic market, as consumers substitute for beef in response to the BSE scare. Broiler exports grow 1.09 percent annually after 2003 as beef consumption recovers and as feed prices remain low following implementation of Agenda 2000 reforms in the grain sector. Thailand’s broiler exports are hurt by the appreciation of its currency in the first half of the decade. Growth over the remainder of the baseline gives Thailand an 18 percent overall increase in broiler exports between 2000 and 2010, enabling Thailand to maintain a stable 6 percent share of the international market.

**Dairy**

After stagnating in the 1990s, milk production in modeled countries began increasing in 1998. Over the next decade, milk production increases 9.69 percent despite a 0.68 percent reduction in total dairy cattle inventories. Just over 57 percent of the 38.2 mmt increase in milk production occurs in North and South American countries. U.S. milk production rises 12.2 mmt over the baseline, while cow numbers fall 0.8 percent annually, implying a 1.8 percent annual increase in output per cow. Productivity in Brazil’s dairy sector rises 2.5 percent annually, which is coupled with a 3.7 percent increase in cow numbers over the next decade to produce a 7.4 mmt increase in milk output. Milk production in Mexico and Argentina increases 3.1 mmt and 2.2 mmt, respectively, through combined growth in cow inventories and productivity per cow. With the exception of Argentina, which exports roughly 32 percent of its increase in milk production in the form of dairy products, the vast majority of the growth in milk production in the Americas over the next decade remains in domestic markets to satisfy demands for fresh milk and dairy products.

In contrast, the bulk of the combined 3.4 mmt increase in milk production in New Zealand and Australia is destined for export markets. New Zealand milk production increases 1.5 percent annually over the baseline, and 94 percent of the increase is exported as cheese and WMP. Australian milk production grows less than 1 percent annually from 2001 onward, as the industry rationalizes current capacity in response to recent deregulation. More than 70 percent of the growth in Australian milk production is used to satisfy increases in domestic consumption of fluid milk, cheese, and fresh dairy products. Substantial growth in milk production also occurs in Poland, India, China, and the European Union.

International prices for NFD and WMP increased 44.5 and 22.4 percent respectively in 2000. Powder prices decline 4 to 5 percent in 2001, as powder supplies increase in response to higher prices. From 2003 onward, powder prices rise an average of 1.7 percent annually. The strength in powder markets is driven by a recovery in Asian demand for milk proteins coupled with a strong demand for cheese in several countries, which keeps additional milk from flowing to powder plants. In addition, WTO commitments to reduce export subsidies limit the ability of the EU and U.S. to increase milk powder exports. A strong increase in cheese exports from Australia and the EU contributed to the 2.9 percent decline in international cheese prices in 2000. Likewise, a 21 percent increase in New Zealand butter exports played a role in the 7.7 percent decline in butter prices. Butter and cheese prices rise steadily after 2002, increasing, respectively, 2.2 and 3.1 percent annually.
Russian butter imports remain below 50 tmt until economic recovery begins to have a significant impact on consumption in 2006. Russian butter imports rise to 79 tmt by the end of the baseline. Mexican butter imports decline 20 tmt as greater domestic production reduces excess demand. Increased butter demand in developing Asia and other countries in the rest of the world increases butter imports 34 tmt over the baseline. European countries supply the bulk of the growth in butter trade, with the EU and Poland showing the largest increases in exports. However, butter exports from the EU remain well below their quantity limit for subsidized exports. EU butter stocks rise gradually until the implementation of the Berlin Accord reforms in the EU dairy sector in 2005. With substantial stocks and weak international demand, the EU domestic butter price declines 1.5 percent annually from 2000 to 2005. As the intervention price for butter is lowered, prices decline more than 3 percent annually, stabilizing at 3.04 euro per kg in 2007.

Per capita cheese demand in modeled countries grows an average of 1.6 percent annually over the next decade, for a total increase in cheese consumption of 2.18 kg per person. The United States and the European Union account for 68 percent of the total increase in cheese consumption. Argentina, Brazil, and Russia account for an additional 16.4 percent of cheese consumption growth. Excluding Russia, domestic producers supply virtually all of the additional cheese consumed in these countries. Growing cheese demand in Russia is met by imports, largely from the EU and Eastern European countries. Cheese exports from Australia and New Zealand grow roughly 35 percent over the baseline. Exports from Oceania satisfy the 21 tmt increase in Japanese cheese imports and the 84 tmt growth in cheese imports by other countries in Asia and the rest of the world. International cheese prices rise steadily over the baseline, reaching $2,253 per metric ton in 2010.

Supplies in international NFD markets remain tight in the coming decade, keeping prices above $1,700 per metric ton for the entire projection period. Dairy processors in New Zealand shift milk toward WMP and cheese early in the baseline, which reduces NFD exports; however, persistent growth in NFD prices brings New Zealand exports back to 2000 levels by the end of the baseline. Australian NFD exports decline 44 tmt from 2000 to 2010, as more milk is shifted into cheese production. Strong feed demand and exports reduced NFD stocks in the EU by more than 40 percent in 2000. With short supplies, EU NFD prices remain well above intervention levels. Likewise, despite elimination of the dairy support program in 2002, U.S. NFD prices remain above world prices. Exports from both the EU and the U.S. are limited by WTO export subsidy commitments. Poland seizes the opportunity to recover some of its NFD exports lost following the Russian economic crisis and increases its exports by 43 tmt over the baseline. Argentina and India also increase NFD shipments modestly. Mexican NFD imports decline slightly as a result of substantial growth in milk production, a significant portion of which is enticed into milk powder production by the favorable prices. Total NFD trade remains stable over the baseline at roughly 900 tmt.

WMP trade grows a modest 17 percent over the next decade. Argentina, Australia, and New Zealand are able to supply the increased demand in WMP imports. New Zealand’s exports of WMP increase 144 tmt by 2010, accounting for two-thirds of the total growth in trade. More than half of the increase in New Zealand’s WMP exports occurs in 2001. Argentine WMP exports grow 1.8 percent annually to reach 174 tmt by 2010. Some of Argentina’s exports are shipped to Brazil, where WMP imports rise 2.2 percent annually. Australian WMP exports rise 10 percent over the baseline, and competition of milk supplies and subsidy allocations keep EU WMP exports stagnant at 525 tmt. Developing countries in Asia, Latin America, and Africa represented by the “rest of world” aggregate increase WMP imports by 17 percent over the baseline, reaching 1.28 mmt in 2010.