

Overview of the 2009 U.S. and World Outlook

The Macroeconomic Environment

Macroeconomic projections used in the 2009 FAPRI baseline were obtained from IHS Global Insight. Recent market turbulence originating in the advanced economies spreads and slows down world economic expansion in 2009, producing an average annual rate of real GDP growth of -0.7%. However, significant recovery is projected for the following year, with long-term real GDP growth of 3.5% reached by 2011. The economic downturn is offset somewhat by weaker energy prices, providing some relief for consumer incomes. Downside risk in the outlook centers on how quickly confidence in the financial system is restored.

The U.S., where housing and financial market stress originated, shows the greatest impact, with weak economic growth in 2008 of 1.16% followed by a slowdown to -2.5% in 2009. The slowdown in 2009 spills over into Canada (-1.5%) and Mexico (-2.3%). Even with the widespread slowdown, most of Latin America posts positive growth in 2009 of 1.2%, largely driven by strong domestic demand. Price inflation is expected to be significant in this region, particularly in Argentina and Venezuela.

The short-term outlook for the Asian economies also reflects the impact of the economic slowdown in the advanced economies. Asia posts a weak real growth rate of only 1.2% in 2009. A bright spot in the outlook is that after recovery, China, Vietnam, and India post solid growth. Inflation remains low in most of Asia.

The economic growth convergence between the EU-15 and the EU NMS continues, and all are affected by the slowdown. The EU-15 countries show -1.9% GDP growth, and the EU NMS post a weak growth of 0.6% in 2009. After depreciating in 2009, most EU members experience real currency appreciation against the U.S. dollar.

After a decade-long run of high and sustained growth in the CIS, Russia and Ukraine's growth is arrested, with the slowdown accompanied by declining commodity prices. The ruble in Russia depreciates slightly while the hryvnia in Ukraine strengthens in real terms against the U.S. dollar after 2009. Price inflation is projected to be high in the short run.

Sound policy reforms, rising capital inflows, and prudent fiscal policy sustain a strong outlook in Africa, with GDP growth of 4.8%. Most currencies in the region depreciate relative to the U.S. dollar, and price inflation is moderate.

Weak crude oil prices affect oil-exporting countries in Africa and the Middle East. The Middle East experiences weaker growth performance relative to the last five years. However, diversification initiatives that expanded investments in the non-oil sector dampen the effect of low crude oil prices.

Agricultural and Trade Policy Assumptions

Bioenergy mandates continue to be key drivers in the current outlook. Major energy policies included in the baseline are the U.S. Energy Independence and Security Act (EISA) of 2007, the 2003 Renewable Fuels Directive of the EU, fuel mandates and regulations for Argentina and Brazil, Indonesia's newly implemented biodiesel consumption mandate, and producer incentives in Canada. In addition, new provisions in the Food, Conservation, and Energy Act of 2008—the 2008 farm bill—are included in this baseline. Provisions set to expire under both this farm bill and the EISA are assumed to continue throughout the baseline.

The 2008 world policy environment included the continuing implementation of reforms in the CAP. In particular, the sugar reforms of the EU Common Market Organization were adopted in 2006. The reforms cover a transitional period from 2006/07 to 2009/10. One of the main goals of the reforms is to reduce sugar production by 6 million tons, white value, through voluntary quota reductions and through lower intervention prices. The 6-million-ton reduction in quota sugar is projected to be reached by 2009/10. Beet production over the quota is expected to be used in ethanol production. To meet growing demand both within the European Union and on global markets, the European Commission decided to increase the milk quota by 2% beginning April 1, 2008. In rice, the EU intervention price mechanism is abolished for 2009/10.

The outlook assumes recovery from the SPS shocks and trade restrictions in meat markets associated with BSE in North America, FMD in Latin

America, especially Argentina, AI in Europe and Asia, and blue ear disease in China.

Under the Uruguay Round Agreement on Agriculture, the commitment schedule of developed countries for export subsidy limits, TRQ expansion, import duty reduction, and domestic support reduction are fixed at 2000 levels. Developing countries had their last reform installment implemented in 2004. All of these commitments are held fixed through 2018/19. The 2009 outlook does not include any conjecture on policy changes arising from the Doha Round. In February 2008, Ukraine officially acceded as a full member of the WTO. An extended policy database is available on our Web site and is updated once a year in the spring (www.fapri.iastate.edu/tools/).

The Outlook for U.S. Agriculture

The world financial crisis, the drop in petroleum prices, and a variety of other factors have dramatically changed the outlook for U.S. agriculture. After rising to record levels, prices for grains, oilseeds, and milk all fell sharply in the final months of 2008, resulting in diminished prospects for producer revenue in 2009. Farm production expenses are also expected to decline in 2009, and the rate of consumer food price inflation is expected to slow. After a sharp reduction in 2009, net farm income could begin to recover in 2010 if the global macroeconomy also rebounds.

Crops

A large increase in world grain production and a weaker global economy have resulted in sharply lower U.S. exports of corn and wheat in 2008/09. Lower petroleum prices encouraged slower growth in U.S. ethanol production, and lower livestock and poultry production contributed to a sharp decline in feed use. As demand prospects deteriorated, grain prices fell sharply, with nearby futures for corn and wheat declining by more than half from peak to trough in 2008.

The decline in grain prices had halted by early 2009, but prospects remain very uncertain. Ethanol production expands in response to the EISA biofuel use mandates, and the assumed recovery of the U.S. and world economies also supports grain demand. In response to building stocks and lower prices, U.S. wheat planted area declines in 2009. Corn production growth is limited by continued high production costs

and competition from soybeans. Projected grain prices remain well below the 2008 peak but above pre-2007 levels.

Soybean prices also increased sharply in early 2008 and then declined dramatically in the final months of the year. In contrast to the grains, U.S. soybean stocks are relatively tight in 2008/09, as export demand remains strong. Soybean crush demand is weak because of reduced demand for both soybean meal and soybean oil. Soybean oil prices have declined dramatically from their peak, as export demand has slackened and domestic non-biodiesel demand for soybean oil has contracted. If the global economy recovers, world biodiesel production increases, and supply growth in South America remains moderate, soybean prices may also find support above pre-2007 levels.

The world recession has sharply reduced demand for cotton, resulting in lower U.S. cotton prices, in spite of a dramatic reduction in U.S. cotton production in 2008. Even with a further projected decline in cotton planted area in 2009, it takes time to draw down stocks to levels that allow significant price recovery.

The 2008 farm bill created several new programs, including the Average Crop Revenue Election (ACRE) program. ACRE is a voluntary program that makes payments to producers when state per acre revenues for a particular commodity fall below a trigger tied to a moving average of national prices and state-level yields. ACRE is likely to be attractive to grain and oilseed producers, providing more payments on average than the traditional payments that program participants must agree to forgo.

Livestock, Poultry, and Dairy

Milk prices remained at elevated levels throughout 2007 and in the first months of 2008 because of strong growth in U.S. dairy product exports. Milk production increased in response to those high prices. Even as supplies increased, the global economic slowdown caused U.S. export demand for U.S. dairy products to decline. The resulting collapse in dairy product prices has triggered government purchases under the price support program. Low milk prices result in a decline in cow numbers, and projected milk prices eventually recover to levels that allow milk producers to cover production costs.

The sharp increase in feed costs in 2007 and 2008 lowered the profitability of livestock production, and the result has been slower growth or actual reductions in U.S. meat production. Export demand for beef, pork, and chicken was especially strong in 2008 because of rising incomes, relaxation of trade barriers, and market-specific factors. The combination of smaller supplies and strong foreign demand might have resulted in significant increases in livestock and poultry prices had it not been for the global economic slowdown. U.S. exports of pork and chicken are now expected to decline in 2009, and domestic demand for high-value cuts of beef and other meats is weak. As a result, projected 2009 prices are largely steady (hogs and chicken) or even down slightly (cattle).

If consumer incomes in the United States and other countries again increase beginning in 2010, the resulting increase in meat demand should support livestock and poultry prices. If demand recovers as projected, only a small reduction in meat production will be required to restore profitability to livestock production. If demand recovery is delayed or weaker, it could take a significantly larger supply reduction.

Farm Income and Other Aggregate Indicators

In 2008, high commodity prices led to record levels of crop and livestock cash receipts for U.S. producers. The sharp decline in prices in 2009 leads to a large reduction in crop and livestock receipts. Only a portion of this reduction in receipts is offset by lower production expenses for fuel, fertilizer, and feed. Net farm income declines significantly in 2009 but slowly recovers in later years. In any given year, net farm income is likely to differ significantly from projected levels, as net income is small relative to volatile receipts and expenses.

Government farm program outlays by the CCC remain moderate, as grain and oilseed prices remain above levels that would trigger marketing loan benefits and CCPs. The new ACRE program could result in significant outlays, beginning in FY 2011, but will be very sensitive to market prices and crop yields. For the last several years, crop insurance program costs have been constrained, as generally favorable weather has limited indemnities. With crop prices, crop insurance premiums, and premium subsidies all well above pre-2007 levels, crop insurance outlays

could increase sharply if less favorable weather results in greater indemnities.

Consumer food prices rose by 4.0% in 2007 and by 5.5% in 2008, the highest rates of food price inflation in many years. Lower farm commodity and energy prices result in a sharp reduction in the rate of consumer food price inflation in 2009. In later years, projected food price inflation remains moderate, but actual food prices will continue to be sensitive to changes in farm commodity prices, petroleum prices, and other processing and distribution costs.

Alternative Baseline Projections

The figures reported in this publication are based on a single set of assumptions about the weather, the economy, and other factors that affect commodity supply and demand. FAPRI also has developed a stochastic baseline of U.S. agricultural and biofuel markets that estimates market outcomes under a wider range of assumptions. In essence, FAPRI develops 500 related baselines that share some assumptions, such as a continuation of current government policies, but that differ in their assumptions about crop yields, production costs, petroleum prices, export demand conditions, and other factors.

Results of the stochastic baseline analysis are summarized in the *U.S. Baseline Briefing Book* available at www.fapri.missouri.edu. That publication provides average results from the 500 related baselines. For most variables, those average results from the stochastic analysis are very similar to the estimates reported in this publication. There are exceptions to this general rule, however. Assumed rates of participation in the ACRE program in 2009/10 were reduced in the stochastic analysis (60% for corn, soybeans, and wheat rather than the 70% reported here), in part based on what was learned from the stochastic analysis. In the case of farm program outlays and biofuel market outcomes, averages from the stochastic analysis sometimes differ from the figures presented here because of underlying asymmetries in the policies analyzed.

The Outlook for World Agriculture

The widespread economic slowdown in 2009 weakens demand for agricultural commodities and, coupled with the high carryover supply from the last two years of high prices, causes a general retreat

in prices for all commodities in 2009/10. However, continuing world population growth, recovery in income growth, and expanded bioenergy mandates drive prices back well above pre-2007 levels, but below recent peaks.

Grains

World grain prices are lower in 2008/09 because of the higher supply in world markets. They are projected to decrease further in 2009/10, with the largest decline seen in the wheat price, followed by the barley price. Grain prices remain strong over the next 10 years because of growing demand for food, feed, and fuel purposes.

Total grain area increases by 1.4% over the decade and reaches 483.5 mha in 2018/19. Corn area increases the most, especially in the U.S. and in Asian countries, followed by barley area and sorghum area. Wheat area is projected to decline slightly over the baseline period.

Total world grain consumption increases by 199.3 mmt over the decade, with most of the demand increase occurring for corn. Population growth boosts world wheat demand for food purposes by 60.4 mmt over the projection period, with the demand increase mainly coming from Asian, African, and Middle Eastern countries. Corn feed use increases over the next decade by 55.9 mmt because of growth in the livestock sector. Food and industrial use of corn also grows, by 68.2 mmt, over the same period, with both population growth and the expansion of the ethanol sector contributing to this increase. Barley consumption increases by 10 mmt over the projection period, with gains in both feed and non-feed use. Sorghum feed use declines, whereas non-feed use increases, with total consumption increasing by 4.8 mmt by 2018/19.

World wheat net trade increases to 99.4 mmt in 2009/10 because of the higher supply, which lowers the world wheat price. Wheat net trade grows 1.8% annually on average, reaching 118.6 mmt in 2018/19. The U.S. market share decreases to 24.5% in 2008/09 with the recovery of production in other exporting countries. It decreases to 22.4% by the end of the projection period. The EU increases its wheat market share in 2008/09 because of higher production. Its market share decreases in 2009/10 with the decline

in exports. Argentina is projected to recover its market share in 2009/10 with an upturn in production. Canada's share of the wheat market decreases over the next 10 years, as domestic consumption increases and domestic production declines. Australia's market share increases in 2009/10 and onward since production grows more than domestic consumption.

Wheat net imports of Asian countries increase by 5 mmt over the next 10 years, owing to the increase in food use that comes from population growth. African and Middle Eastern countries increase their wheat net imports by 10.6 mmt over the decade. Latin American countries' wheat net imports reach only 10.4 mmt in 2018/19 because of production growth.

World coarse grain net trade is projected to grow at an average annual rate of 2.3%, reaching 117.3 mmt in 2018/19. Corn net trade increases the most, by 22.9 mmt, followed by barley. Although, the U.S. share of the coarse grain market drops to 50.7% in 2008/09, the U.S. increases its market share over the next 10 years because of growth in production. The U.S. share reaches 55.3% in 2018/19. Argentina's share of the coarse grain market is projected to increase in 2009/10 and onward because of higher corn net exports. Ukraine recaptures its market share in 2008/09 with an increase in production and net exports of barley and corn. Brazil's share of the coarse grains market declines as consumption grows faster than production. Australia's market share stays stable over the decade.

In 2009/10, world corn net trade increases since consumption growth outpaces production growth. Over the next 10 years, world corn net trade is projected to increase, reaching 92.6 mmt in 2018/19, because of demand growth in major importing regions such as Asia, Africa, and the Middle East. The U.S. share of the corn market decreases in 2008/09 to 63.3% with lower U.S. exports. It reaches 65.7% in 2018/19. Growth in area and yields raises Argentina's share of the corn market to 17.1% by 2018/19. Brazil's market share decreases to 6.4% by 2018/19 as domestic consumption growth exceeds production growth. South Africa's market share reaches 3.1% in 2018/19.

The largest import demand increase for corn comes from Asian countries because of growth in their livestock industry. Asian net imports increase by 6.6

mmt over the decade. African net imports increase by 5.2 mmt in the same period. Among Latin American countries, Mexico maintains its role as a major corn importer. Middle Eastern corn net imports reach 10.3 mmt in 2018/19.

U.S. DDG exports increase more than 46% over the next 10 years, reaching 6.6 mmt in 2018/19. Mexican DDG imports reach 1.7 mmt in 2018/19, and Canadian imports reach 1.2 mmt. Asian imports of DDG are also growing as a replacement for corn. Destinations include Indonesia, Japan, the Philippines, South Korea, and Taiwan.

World sorghum net trade grows slightly over the projection period, reaching 4.8 mmt by 2018/19, with growth in demand. Japanese net imports reach 1.4 mmt in 2018/19, whereas Mexican net imports reach 2.3 mmt by 2018/19. The U.S. market share of sorghum increases in 2009/10 to 84.3% and stays relatively stable at that level for the rest of the projection period.

World barley net trade reaches 19.9 mmt in 2018/19, fueled by growth in Asian demand. The EU slightly decreases its barley net exports in 2009/10 because of lower production and higher domestic consumption. EU net exports of barley reach 6.1 mmt in 2018/19. Australian net exports increase in 2009/10 and reach 3.9 mmt by 2018/19. Canadian net exports total 2 mmt in 2018/19. Ukrainian and Russian net exports of barley reach only 4.8 mmt and 1.8 mmt, respectively, by 2018/19.

Rice

High international rice prices persisted in 2008/09 as major rice exporting countries continued to implement export restrictions and stock controls to slow increases in domestic prices. This prompted some major rice importing nations to tender larger-than-normal import bids and relax import restrictions. Rice export prices are expected to weaken in the short run as more exportable supplies become available. They then increase steadily over the baseline, driven by strong consumption and trade, reaching \$526 per mt by 2018/19. Population-driven consumption growth keeps the rice stocks-to-use ratio between 15% and 21% over the baseline.

World rice area in 2008/09 increased by 1.5 mha from last year's level. Area gains in Bangladesh, China, India, Nigeria, Pakistan, Thailand, and the U.S.

more than offset declines in the Middle East, South Korea, Myanmar, and Vietnam. Over the baseline, world rice area declines marginally but the average yield grows by 0.8% per year.

While total global rice use increases steadily, at 1.3% annually, because of population growth, average per capita consumption continues to decline slightly, driven by urbanization, income growth, aging populations, and diet diversification in a number of Asian countries.

Over the next decade, global total rice trade is projected to grow by 2.1% annually, reaching 36.3 mmt in 2018/19. Despite this growth, rice remains thinly traded in the international market relative to other grains, with the share of total trade to total consumption at 7.6% in 2018/19. Thailand, Vietnam, and India account for 91.4% of the volume growth in world rice exports. These three countries experience declines in rice per capita consumption, which allows yield-based growth in production to outpace domestic consumption. Other significant net rice exporters include Pakistan, China, Uruguay, Argentina, and Egypt. In the U.S., growth in domestic use outpaces that of production, causing U.S. rice exports to decline over the same period.

With strong growth in population and per capita rice consumption, rice imports in Africa and the Middle East continue to increase substantially, accounting for 42.1% of the total volume growth in world rice imports over the next decade. With relatively slow progress in its rice self-sufficiency efforts, the Philippines is projected to be the top rice net importer over the same period. Other major rice net importers are Indonesia, Bangladesh, Brazil, the EU, Mexico, Turkey, and Malaysia.

Oilseeds

World oilseed prices decline sharply in 2008/09 from the record highs of 2007/08 because of weaker world demand. Reduced demand growth in the short term leads to another price reduction in 2009/10. However, prices recover in the later years, led by strong growth in vegetable oil demand for food and industrial uses. Despite area expansions and yield improvements, oilseed prices are not expected to return to their historical levels for the remainder of the projection period.

World oilseed area increased by 7% in 2008/09 because of milder competition from coarse grains. Area growth slows by next season because of lower prices but recovers later on, reaching 204 mha at the end of the outlook period. Soybean area expansion in South America accounts for 42% of the total oilseed area growth. Palm kernel area expands 20% while rapeseed area grows 8% over the next decade as Ukraine and the EU expand the harvest area for the EU's biodiesel industry. The expansion of oilseed area is driven by increased worldwide demand for protein meals and vegetable oils.

World soybean area rebounded and increased production by 8% in 2008/09, led by 16% growth in U.S. acreage. However, yield losses in the main producing countries dampened the production rebound to 5%. World production continues to respond to the high prices and reaches 296 mmt by the end of the outlook period. Argentina, Brazil, and the U.S. again dominate world soybean production.

Declining crop area resulting from falling real domestic prices and expanding urban uses leads to almost stagnant soybean production in China. Meanwhile, robust economic growth encourages a 42% increase in domestic consumption over the baseline period. Policies favoring oilseed imports and domestic crush make China the world's leading soybean importer. China expands its imports to 56 mmt, accounting for 59% of total world imports over the next 10 years. The EU's net import share continues to decrease during the outlook period, as it imports processed products rather than beans. Brazil surpasses the U.S. to become the largest soybean net exporter in 2014/15, and the difference increases by the end of the period. Brazil's export share reaches 44% by the end of the decade while the U.S. share of world soybean net exports is projected to decline to 32% by 2018/19. World rapeseed net trade increases 21% over the outlook period, primarily driven by biodiesel demand in the EU. Canada remains the leading net exporter, although its share of world net exports declines from 61% to 57% over the decade. Ukraine is the emerging net exporter, accounting for 28% of world net exports by 2018/19.

Driven by expansion in the world livestock sector, oilseed meal consumption reaches 270 mmt by

the end of the projection period. Around 81% of this increase is from growth in soybean meal consumption. China increases its consumption by 4.2% annually because of strong expansion in its livestock sector. U.S. domestic consumption expands by 17% over the decade whereas the U.S. share of world consumption falls slightly. Soybean meal also accounts for the majority of the growth in oilseed meal trade. The volume of net trade in the soybean meal market increases by 31% throughout the baseline. Argentina, the leading soybean meal net exporter, ships 98% of its production to the world market because of its differential export tax. Argentina exports 36 mmt by 2018/19 and its market share grows to 52%. The EU remains the top net importer, accounting for 37% of world net imports.

Increasing incomes and population in developing countries, combined with emerging biodiesel industries in various countries, stimulate an additional 37 mmt of world vegetable oil consumption by 2018/19. World vegetable oil consumption per capita is expected to increase to 20 kg over the baseline. World palm oil consumption increases by 37% while soybean oil consumption grows by 33% over the next 10 years. Rapeseed oil consumption reaches 24 mmt during the baseline because of biodiesel production in the EU. China's soybean oil food consumption per capita reaches 11.4 kg and its soybean oil net imports increase 80% by 2018/19. Despite its domestic biodiesel mandate, Argentina still dominates world soybean oil exports, holding a 61% share of the world market. Palm oil remains the most traded vegetable oil in the world over the decade. Chinese palm oil net imports expand to 9.1 mmt by 2018/19, accounting for about 22% of world net imports. Indonesia, the dominant palm oil exporter, increases its palm oil net exports to 22 mmt as the world price recovers over the next 10 years.

Cotton

World macroeconomic conditions, along with strong demand for competing crops to be used in the production of biofuels, have weighted heavily on world cotton markets. Acreage competition has shifted cotton area in the world, and notable declines have been seen in the United States. At the same time, improving yields have helped to maintain supplies. The downturn in the world economy has trimmed

world demand for the first time in a number of years, and cotton prices have retreated to lower levels. This combination of factors remains uncertain, making the future of cotton markets uncertain. It is more clear, however, that the United States cotton market is likely to be smaller in the future.

Recent growth in world cotton production was driven by strong yields and above-average cotton acreage. Higher prices for grains and oilseeds, due to biofuels production, have constrained acreage growth in many locations and continue to provide acreage competition over the projection period. This acreage competition and weak prices from slack demand reduce U.S. cotton planted acreage to 3.1 mha in 2008/09 and hold area at this level in future years even as the world economy improves. Other regions, with fewer alternative crops or a comparative advantage in cotton production, are likely to hold on to more of their cotton acreage to take advantage of improving prices.

Prices, as measured by the Cotlook Far East A-Index, are expected to fall to \$1,345 per mt in 2008/09 as demand softens. Prices grow in the following years, as supply constraints, through competition for acreage from grains and oilseeds, contribute to an improved outlook for prices. World cotton consumption is expected to fall to 24.8 mmt in 2008/09 under difficult world macroeconomic conditions and to return to growth under the assumption of a return to GDP growth in 2009/10. Growth in mill use is just above population growth, reaching 30.0 mmt by 2018/19. World cotton spinning continues to concentrate in a small number of countries. China, India, Pakistan, and Turkey account for 72% of world mill use in 2008/09 and expand to 77% of world mill use by 2018/19. Developed countries are likely to see continued declines in their consumption of raw cotton. The United States must increasingly rely on export markets for the majority of demand.

Sugar

The world sugar market experiences a deficit in 2008/09 with a decline in production and stocks and an increase in consumption. Although several countries face a decrease in production, the largest shortfall, 5.7 mmt, is seen in India. Brazil maintains its record sugarcane production in 2008/09, with 59.5%

of the sugarcane going to ethanol production because of growing domestic ethanol demand and falling domestic sugar prices. Production in the EU continues to decline as the restructuring period of the CMO sugar reforms approaches its final year in 2009/10. The EU emerges as a major sugar importer because of the reforms. World sugar production is projected to increase by almost 23% as both harvested area and yields increase, especially in the major sugarcane-producing countries.

Because of the relatively inelastic response to income, the economic slowdown has not had a significant effect on world sugar consumption. In fact, consumption increases by 3.2% in 2008/09. And with sustained growth in real GDP and population, particularly in developing countries, sugar consumption increases by 20% over the projection period. As a result of the decline in world production and the growth in consumption, world net trade declines by 11% in 2008/09, with the drop in sugar exports from India only partially offset by increased exports from Brazil, Australia, and Thailand. By 2018/19, world net trade is projected to increase by 38%.

In addition to market fundamentals, the world sugar price was impacted by macro-economic conditions in 2007/08. The sugar price was volatile and saw a large increase in 2008 because of the depreciation of the U.S. dollar, high energy prices, and speculation. As energy prices fell and the value of the U.S. dollar rose, the sugar price began to decline, averaging 13¢ per pound in 2008/09. The price increases by 15% over the projection period because of increased demand for sugar from the EU and several Asian countries, including China, India, and Pakistan.

In terms of market shares, only a handful of sugar-exporting countries account for over 90% of world trade, with Brazil, which accounts for almost 60%, continuing to maintain the largest share throughout the projection period. On the import side, Russia currently accounts for 8.5% of world net trade. However, this share declines to 5% by 2018/19 as Russia's sugar production continues to expand. Asia, as a region, constitutes the largest importing block, with China, Indonesia, Japan, Malaysia, and South Korea together accounting for about 19% of world trade over the projection period.

Ethanol and Biodiesel

Despite declining crude oil prices, there is still sustained interest in biofuels as an alternative fuel source. Many countries are continuing to promote ethanol use through mandates and/or directives. In the world ethanol market, the major players remain Brazil and the United States. The United States is the largest producer of ethanol, followed by Brazil. Brazil, however, is the largest exporter. The EU is also emerging as a significant player.

The world ethanol price increased in 2008 as crude oil prices peaked and U.S. net imports increased. With the significant decline in both crude oil prices and U.S. net imports in 2009, the world ethanol price declines by 16%. The price recovers over the projection period, increasing as world demand for ethanol grows, especially in the United States as a result of the EISA 2007 biofuel mandates.

Brazilian production of ethanol increases steadily over the projection period, inducing a rising share of sugarcane going into ethanol production.

Biodiesel is another renewable energy source adopted in a growing number of countries. The world price of biodiesel (Central Europe FOB) decreases to \$3.74 per gallon in 2009, driven by lower petroleum and vegetable oil prices. Recovery of the crude oil price and implementation of mandates in Argentina and Brazil lead to price increases through the remainder of the period. The world biodiesel price increases to \$5.56 per gallon by 2018, driven in part by higher demand from the EU. World net trade remains relatively stable at around 800 million gallons over the next decade, as domestic consumption mandates are implemented in many producing countries.

Livestock and Poultry

SPS and food safety concerns stemming from BSE, HPAI, FMD, and blue ear disease in China and from traceability issues continued to impact the world meat market. Average per capita meat consumption increases by 5.6 kg over the next decade, representing a 1.0% annual increase. Meat consumption reaches 57.8 kg per person per year by 2018. Pork consumption has the highest share in the consumption basket, growing the fastest among the three meats at 1.1% annually.

Continuously recovering from the negative influence of BSE, meat demand increases world meat

trade by 24.3% (4.12 mmt) over the next decade, with net trade reaching 21.05 mmt in 2018. Rising meat demand fuels an 18.0% (38.62 mmt) increase in world meat production over the baseline, with production reaching 253.20 mmt in 2018.

The SPS market shock, high feed prices, and growing demand pushed meat prices up to record levels. Average prices over the projection period are higher relative to the recent period. The beef price declines by 2.9% in 2009 and then increases, but it reverses beginning in 2015, reaching \$102.8/cwt in 2018. The pork price cycles throughout the decade. It peaks again in 2012 at \$56.3/cwt and ends at \$56.2/cwt. After a 3.7% increase in 2007, the poultry price rises at an average rate of 1.5%, reaching \$90.7/cwt in 2018.

Beef

World beef trade recovers and is projected to continue to grow by an average rate of 2.0% throughout the decade, ending at 7.0 mmt in 2018. Responding to the recovery in trade and the growth of the world price, beef production increases at an annual rate of 1.1% (6.0 mmt) in the next decade, reaching 60.7 mmt in 2018.

A few factors affect world beef trade. First is the recovery of demand from BSE concerns. U.S. beef exports to Japan are still age-verified. High world prices constrain recovery in the short run. Further demand recovery drives growth in the longer run. Second, faster consumption growth fuels rising imports in several developing countries, such as Egypt, the Philippines, and Mexico. Third, China and the European Union have experienced increasing demand and have changed from beef exporters to beef importers.

Pork

Benefiting from trade shocks from BSE and AI, pork trade grows by 3.5% (1.68 mmt) annually in the next decade, reaching 5.70 mmt in 2018. Pork production increases at a rate of 1.9% (17.75 mmt), reaching 112.95 mmt in 2018.

Poultry

Broiler trade continues to grow at a rate of 3.1% annually over the projection period. Total broiler trade increases by 1.48 mmt, reaching 8.34 mmt in 2018. Total broiler production increases by 2.1% (14.1 mmt), reaching 79.53 mmt in 2018. The poultry price

increased in the past two years, by 18.7% in 2007 and 4.3% in 2008.

Dairy

Over the next decade, milk production grows in most countries. World milk production increases 18.8%, with most of the growth generated by gains in productivity per cow. Of the 98.1 mmt increase in milk production, 31% occurs in the Americas, primarily in the U.S. and Brazil, and 47% occurs in Asia, mainly in China and India. Higher milk production facilitates increases in dairy production. World total butter production increases 29.3% over the baseline, with India accounting for over 90% of the growth. Total cheese production grows 18.2%, with the U.S. and the EU accounting for more than half. NFD production rises 22.1%, with the greatest gains occurring in India, which comprises roughly 30% of the growth. With the exception of the EU, WMP production grows in most countries, increasing a total of 21.2%.

Dairy prices reached record-breaking levels at the end of 2007 and then declined through 2008. Because of unfavorable economic conditions and production growth in many countries, world dairy prices decrease in the midterm. Economic growth and population growth support higher dairy demand, which, along with high feed costs, puts upward pressure on dairy prices in the long run.

Because of the worldwide economic downturn, trade in dairy products declines over the next couple of years, although trade expands substantially in the long run. New Zealand, the EU, and Australia remain the world's largest butter exporters, supplying 90% of total butter trade at the end of the baseline. As New Zealand

and Australian butter exports rise, EU net exports languish.

Strong demand drives a 24.8% increase in world cheese trade over the decade. EU cheese exports decline because of strong domestic demand. Australia and New Zealand's combined cheese market share increases by 6.6% and reaches 49.2% at the end of the baseline. Argentina and Ukraine become increasingly important players in international cheese markets, together accounting for 9.1% of total exports by 2018. Russia and Japan are the leading importers and account for 42.9% of total world imports on average. Sustained by economic and population growth, cheese imports of other Asian countries (China, Indonesia, Malaysia, Philippines, South Korea, Thailand, and Vietnam) increase by 2.6% annually

Australia, New Zealand, the EU, and the U.S. captured about 88.3% of the NFD export market in 2008. Their combined market share stays at around 82% over the baseline, as there is a slight increase in NFD exports from other countries, including Argentina and Brazil. Asian countries, Algeria, and Mexico are major importers and increase their NFD imports over the projection period.

WMP trade grows 23.4% over the baseline. While EU WMP exports decrease by 14.3%, Australia, New Zealand, and Argentina expand their exports, respectively, by 77.7%, 14.2%, and 46.8%. These three countries account for over 60% of total WMP exports by the end of baseline. Major importers Algeria, Saudi Arabia, and Malaysia steadily expand their WMP imports, accounting for over a quarter of world WMP imports.