

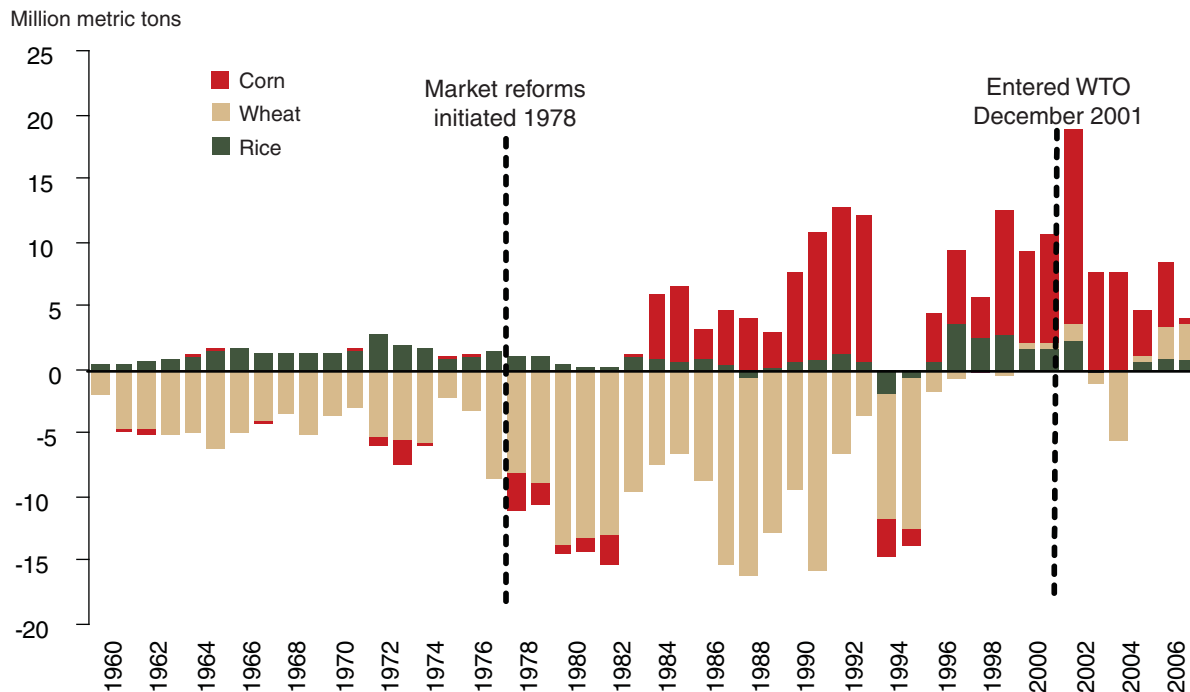
## Implications for China's Future Trade

China can have a major impact on world commodity markets, but its trade has evolved in surprising ways. Before market-based reforms were initiated in 1978, China consistently imported wheat and exported modest amounts of rice each year. Beginning in the 1980s and 1990s, domestic market fluctuations were reflected in fluctuating imports of wheat and exports of corn. (fig. 14). Trade in soybeans and cotton cycled between exports and imports. Swings in commodity trade, coupled with the opaque nature of China's State-trading monopolies, contributed to uncertainty in world markets.

It was widely anticipated that China's WTO accession in December 2001 would lead to rising grain imports as the Government opened low-tariff import quotas for rice, wheat, corn, sugar, and wool and established a more transparent trading process (Lohmar, Hansen, Seeley, and Hsu, 2002). However, China remained a net exporter of corn, wheat, and rice in most years following WTO accession (Gale, 2005). Corn exports declined as excess stocks accumulated in the late 1990s diminished (Gale, 2002; 2004), and rice and wheat trade remained small (Lohmar, 2004). China has defied most forecasts by becoming a net exporter of grain since the late 1990s.

China's impact on world markets has been felt primarily in the soybean and cotton sectors. (Tuan, Fang, and Cao, 2004; Gale, 2007). China's trade in these two commodities was modest until the late 1990s, but after WTO

Figure 14  
China's net exports of grains have fluctuated since 1978



Notes: Negative numbers indicate net imports. Years are "market years" for each commodity.

Source: U.S. Department of Agriculture, Foreign Agricultural Service, Production, Supply and Distribution Data, November 2007. Available at <http://www.fas.usda.gov/psdonline/psdHome.aspx>.

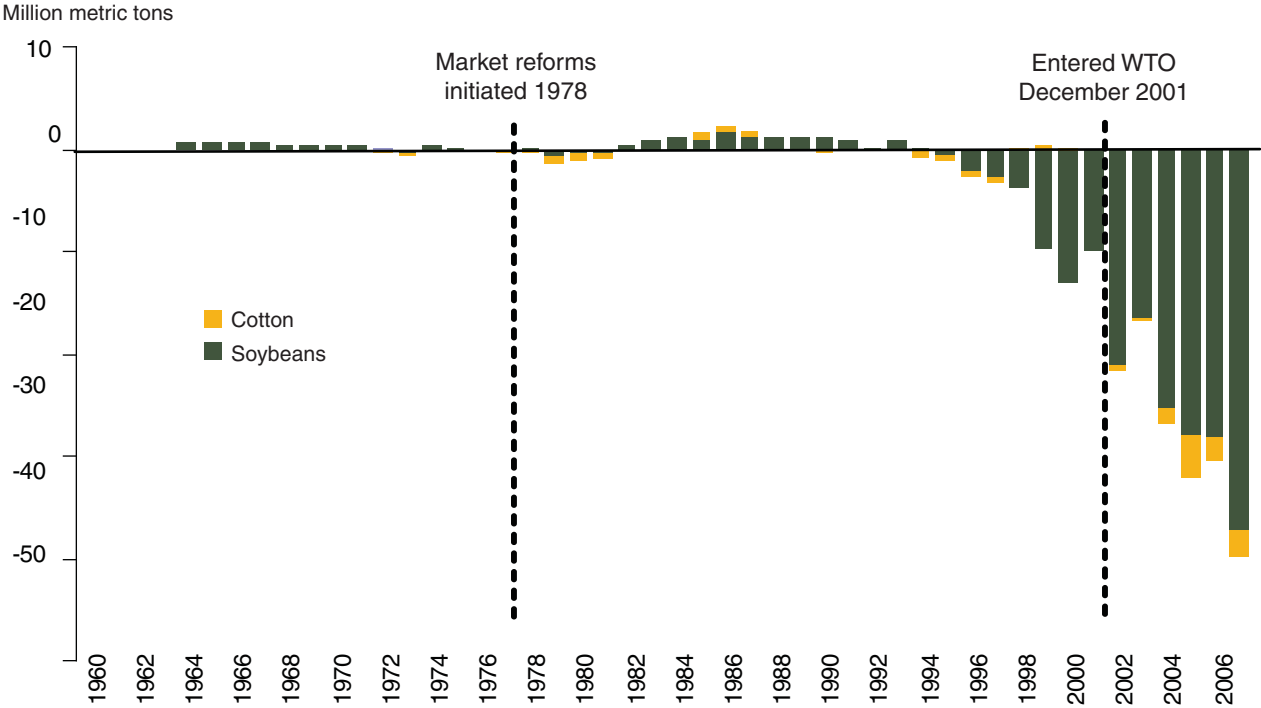
accession, imports of soybeans and cotton exploded (fig. 15). Their combined import total was close to 50 million metric tons (mmt) in 2007/08. Soybean imports reached a record 37 mmt in calendar year 2008. In comparison, net exports of corn, wheat, and rice totaled 4 mmt that year.

Fundamental economic forces like resource scarcity, urbanization, and income growth will be the main drivers of China’s future trading patterns. China’s resource endowment favors import of land-intensive crops and gives it a comparative advantage in labor-intensive goods like vegetables, fruits, and aquaculture products. The impact of basic economic forces on trade will be influenced by the issues described in the preceding section. China’s liberalization, openness to trade and investment, and efficiency in meeting its growing demand for food and fiber will be influenced by how these issues play out.

The combined forces of economic growth and shifting production toward more labor-intensive products will dampen future import and export growth in some products. Continued urbanization and income growth will result in lower per capita consumption of food grains such as rice and wheat, but greater demand for horticultural products such as fruits and vegetables. Since horticultural products are typically labor-intensive, China is well suited to produce them for its domestic market, relying less on imports.<sup>51</sup> In addition, wheat and rice are relatively land-intensive and not produced efficiently in China relative to other more land-abundant countries.<sup>52</sup> But China’s per capita demand for these products is falling, and total demand is beginning to decline as population growth slows. Thus, future imports of food grains will likely remain small.

<sup>51</sup> China’s export capacity of these products will also be affected by domestic consumption growth.  
<sup>52</sup> Particularly wheat; rice is more labor-intensive.

Figure 15  
**China’s cotton and soybean imports surged after WTO accession**



Notes: Negative numbers indicate net imports. Years are “market years” for each commodity.  
 Source: U.S. Department of Agriculture, Foreign Agricultural Service, Production, Supply and Distribution Data, November 2007.  
 Available at <http://www.fas.usda.gov/psdonline/psdHome.aspx>.

Economic growth and urbanization in China has increased demand for livestock products as well as textile and clothing products. Increasing demand for these products will drive demand for imports of land-intensive inputs into their production: oilseeds, feed grains, cotton, and hides.<sup>53</sup> The net effect of China's economic growth on the derived demand for imports of land-intensive inputs into livestock and textile production, however, will be affected by a number of contingencies. Demand for livestock products will continue to grow, but the extent to which additional demand is met with imports of livestock products depends on efficiency improvements in China's livestock sector and other issues, such as disease outbreaks (both in China and abroad). While most observers agree that China's domestic textile, clothing, and shoe consumption is rising, there is scant information on domestic consumption for these products. Thus, the extent to which China's domestic economic growth drives cotton and hide imports is unknown. Moreover, rising wages, the appreciating *Yuan* (CNY), and slowing growth in the world economy threaten China's rapid growth in textile, clothing, and shoe exports.

On top of these fundamental economic trends, issues in resource management, market development, improvement of rural incomes, and the development and adoption of technology will play a role in China's production, consumption, and trade in agricultural products. Improving land and water management practices will affect production of nearly all crops. Market-based prices for land and water that reflect the scarcity of these resources would raise agricultural production costs and induce producers to plant crops that use these resources less intensively or crops that bring a higher return.<sup>54</sup> Marketing reforms will improve China's capacity to produce and market crops and livestock products that satisfy market demand with quality, safety, standardization, and other attributes that consumers want. Price support and subsidy policies have emphasized grain production at the expense of cash crops, dampening market signals to farmers. Rural investment programs are improving basic infrastructure and human capital. Increased machinery subsidies are encouraging substitution of capital for labor as it becomes more expensive. Technology development and extension would increase the technological sophistication of all aspects of agriculture in China.

In this section, we examine the factors that will determine China's future trade in key commodities. Looking at food grains, horticultural products, livestock products, feed grains and oilseeds, cotton, hides, and skins separately, we briefly touch upon past trends and the drivers of those trends, including how these drivers may be altered as China's overall economy changes. The discussion of future trade refers to underlying economic fundamentals, as well as resource management policies, development of modern marketing practices, efforts to improve rural incomes, and technology development, relating them to trends in production and consumption of specific commodities. Moreover, we note China's past emphasis on the self-sufficiency of key strategic crops, but also that many formerly strategic crops are now fully liberalized and sourced from abroad. Past liberalization of policies for formerly strategic crops, such as soybeans and cotton, indicates that China is willing to forego self-sufficiency when costs are high and the crop is not "too strategic."<sup>55</sup>

<sup>53</sup> China's livestock production, predominantly pork and poultry products, is relatively labor-intensive because most is backyard production from farm households. Modernization will serve to replace labor with capital, but still allow China to maintain production of livestock products. Hides from the United States are relatively land-intensive because they are produced from beef cattle raised on rangeland before entering feedlots.

<sup>54</sup> Recall how farmers are responding to high water pumping costs by moving to more water-intensive, but also more profitable, horticultural crops--a phenomenon that has occurred in other regions of water scarcity in the world.

<sup>55</sup> Products that are not necessary to maintain people's daily life.

## Food Grains

Food grains, such as rice and wheat, are fundamentally land-intensive. China can utilize its resource base more efficiently by devoting more of its limited land base to activities that produce greater economic value per unit of land. That would entail importing more grains from land-abundant countries and exporting more labor-intensive products. While China has expanded production of labor-intensive commodities, it remains self-sufficient in rice and wheat. Many observers expected rising imports of grain after China's accession to WTO, but imports of land-intensive commodities were channeled into crops viewed as less vital to food security. The prospects for rice and wheat imports are attenuated by stagnant or falling domestic demand as consumers shift diets to fish, livestock products, fruits, vegetables, and processed foods. As incomes improve beyond a subsistence level, consumers substitute other foods for staple grains. Urbanization is also slowing rice and wheat consumption. On average, China's urban residents consume roughly a third the level of food grain as their rural counterparts.

China's grain production and demand for imports will be affected by improving the resource management and marketing policies discussed previously. Policies that pool land to achieve economies of size and scale will improve productivity and facilitate mechanization. Improved water practices will mitigate stress on water resources, allowing farmers to continue irrigated rice and wheat production. Using land and water resources more efficiently, however, will induce farmers to move these resources into more profitable crops and may slow the growth of grain production. While food grain products are less vulnerable to the food safety issues that have rocked China's horticultural and livestock product markets, improved marketing will enhance the value of high-quality varieties by segregating them from generic grains. Food grain producers are the primary targets of Government policy support in the form of direct subsidies, price supports, and publicly supported research.

In general, the influence of economic and policy trends is more pronounced for wheat than for rice. We will discuss how these trends affect wheat production, consumption, and trade, then follow up with a brief discussion of their effects on rice markets.

### *Wheat*

China is the world's largest wheat producing country and, in some years, it is also a major importer.<sup>56</sup> Imports have fallen in recent years due to slow consumption growth and a boost in production from yield improvements and policy support (Lohmar, 2004). China's role in international wheat markets will depend on a variety of factors. Expanding the scale of farms, which could result from changes in land policies, may improve efficiency since wheat production is more easily mechanized than most other farm enterprises. Much of China's wheat production also depends on irrigation in some severely water-stressed regions in northern China, and water has much higher value in other uses than irrigated wheat, which could be easily purchased from international markets. China still seeks to maintain near self-sufficiency in wheat production. Given that China has committed to a more liberalized TRQ trade regime than other countries faced at this stage of their

<sup>56</sup> The European Union, which is made up of 27 countries and has a common agricultural policy, produces more wheat than China.

development, it is turning to subsidy and price support policies to maintain domestic wheat production at levels close to domestic demand.<sup>57</sup>

China's wheat production could gain from efforts to reform the land tenure system.<sup>58</sup> Pooling land facilitates mechanization and standardization and reduces farmers' transportation time to multiple fields and other production costs. Large plots would also facilitate more commercial, rather than semi-subsistence, production practices (e.g., use of purchased seed rather than saved seed).<sup>59</sup> More commercial production would induce farmers to investigate input quality more carefully and demand quality guarantees, which would help shake-out counterfeiting and other abuses in the under-regulated seed and chemical input industries and improve yields overall. Larger plots would also facilitate the substitution of capital for labor (such as harvesting with combines), increasing overall efficiency, while larger plots with more secure rights would increase farmers' incentive to invest in long-term productivity enhancement. For example, investing in land leveling would improve water conservation and yields in China's irrigated wheat production.

While both wheat and rice production in China is heavily irrigated, wheat production is concentrated in areas with greater water stress and will be more vulnerable to water shortages. Wheat yields in China are much higher than world averages and the United States because of widespread irrigation. The Hai, Huai, and Huang (Yellow) River Basins are China's primary wheat belt, with as much as 70 percent of wheat production occurring in that area.<sup>60</sup> Not only does this area have limited water supplies, but the rainfall that does occur is concentrated between July and September and cannot support winter wheat that grows from October to June. Thus, most wheat production in the region requires supplemental irrigation.<sup>61</sup> As surface water systems dry up or become more unreliable, farmers are turning to ground water to irrigate wheat as ground water tables fall in large parts of the region. Since wheat is a low-valued user of water, falling groundwater tables or other conservation policies that raise the cost of water for irrigation will decrease wheat production in the region.

Reforming marketing policies to establish segregation, traceability, or more integrity of the overall system will have some effect on wheat trade, but not large. Grains are, by nature, less vulnerable to contamination from pesticide residues or organic material because they are covered by a husk and grow well above the ground. The State-owned grain marketing system in China, however, was costly, inefficient, and believed to lose a significant percentage of the grain crop through inadequate storage practices that led to spoilage.<sup>62</sup> The system was also geared to homogenous quality, and China's rapidly expanding food processing industry increasingly demands specific qualities, such as protein and gluten characteristics, to make its food products, particularly for wheat (Lohmar, Wilson, and Bu, 2006). In the past, the demand for wheat with specific quality characteristics resulted in demand for imports since those characteristics could not be reliably procured from domestic producers. Future marketing reforms, particularly the increasing role of private grain traders, will help establish niche marketing for wheat with specific quality characteristics. China's seed breeders are also developing more varieties with the characteristics in demand by food processors.<sup>63</sup> Marketing reforms may encourage more open attitudes toward reporting stock levels. Private traders can benefit from information on local and

<sup>57</sup> Other countries, such as South Korea and Japan, raised tariffs and other import barriers for grains to maintain domestic production when they were at similar stages of economic development. But China is committed to a TRQ regime and also appears more sensitive to high grain prices, causing increased reliance on subsidies. China's TRQ on wheat, however, is the most restrictive of all the products under TRQs (see box, "China's Historical Grain Trade and WTO Accession").

<sup>58</sup> This is true for the production of all grains and even horticultural products and cash crops in China.

<sup>59</sup> Farmers in China are increasingly producing for the market rather than for their own consumption. Roughly 40 percent of China's wheat is marketed some time over the year, with the remaining 60 percent consumed by the household or traded with neighbors.

<sup>60</sup> And an even higher percentage of wheat that goes to market in China.

<sup>61</sup> An estimated 60-70 percent of wheat sown area is irrigated in this region and, since irrigated yields are much higher than rainfed yields, a far higher percentage of production depends on irrigation.

<sup>62</sup> The grain marketing system has long suffered from overstaffing and financial losses. China Grain Bureau statistics show that State-owned grain enterprises cut employment by 2.36 million from 1998 to 2006, but still employed 948,500 in 2006 and incurred losses of over 3 billion yuan (\$375 million) (Nie, pp. 39-40). State-owned grain marketing companies now carry out price support programs.

<sup>63</sup> Farmer's purchases of these seeds are typically subsidized by the seed subsidy program.

national stock levels and make more informed buying and selling decisions. Stock level information will also help reduce the uncertainty that has long characterized China's participation in international grain trade.

Agricultural policy will still play a role in China's wheat trade. Direct subsidies and price supports have encouraged farmers to keep producing wheat even though it consistently brings the lowest profits among major crops in China. The Government accumulated large reserves when it purchased wheat to support prices during 2006-08. In the spring and summer of 2008, when world wheat prices were 40 percent above China's wheat price, China held large wheat reserves that could have been exported at a substantial profit without disrupting domestic markets. Instead, officials cut off most grain exports by restricting export quotas, eliminating an export tax rebate, and assessing a temporary export tax on wheat and other grains. China's wheat exports plunged from 2.3 million metric tons during calendar year 2007 to 125,000 metric tons in 2008, the lowest total since 1999.

### **Rice**

China is the world's largest rice producer and consumer and net rice exporter in most years. This trend is projected to continue. China generally imports high-quality Jasmine rice and exports relatively low-quality Indica rice. When rural people move to cities, they tend to reduce their rice consumption as their diets become more diversified. Rice production uses large amounts of irrigation water, but it is mainly grown in southern China where rainfall and surface water are abundant. Rice is more labor-intensive than other grains, and rice production may be affected by continued rising labor costs in China.

Japonica rice produced in northeastern China is preferred by many urban consumers, and some is exported to Korea and Japan where it competes with exports from California. Some Chinese rice is also exported to Puerto Rico. China's primary rice exports are low-quality Indica varieties that go to markets in West Africa, Southeast Asia, and Central Asia. China's rice imports consist mainly of premium-priced Jasmine rice from Thailand.

### **Horticultural Products**

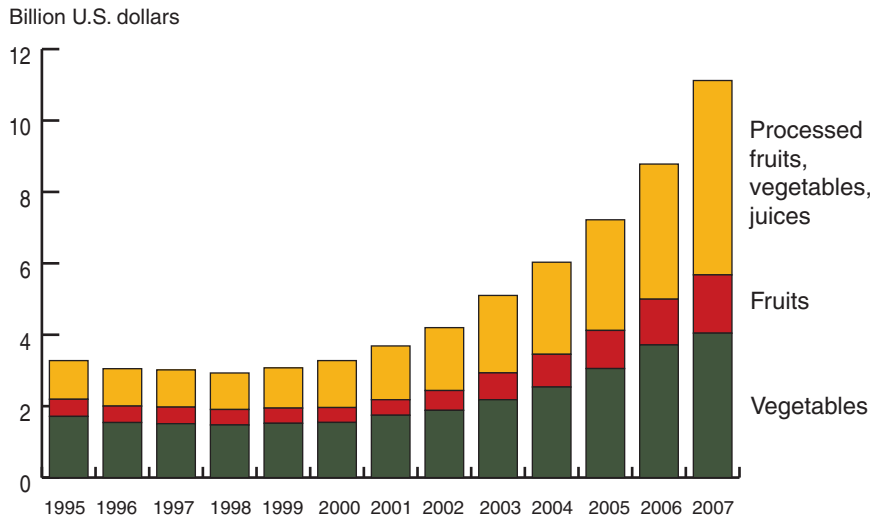
China's horticultural production has boomed in the last 10 years (Huang and Gale, 2006). Growth in horticultural production is largely in response to China's growing domestic demand for these products, but exports have increased as well, particularly since WTO accession (fig. 16).<sup>64</sup> China is finding markets for its fruit, vegetable, and processed products exports all over the world, including Japan, South Korea, the EU, the United States, Russia, and Southeast Asia.<sup>65</sup> The growth in China's horticultural exports has been slowed by food safety concerns in recent years. Continued food safety concerns may dampen China's capacity to continue export growth of fruit, vegetable, and processed products, particularly to more lucrative, higher income countries.<sup>66</sup> Developing modern marketing chains that can provide greater safety assurances will help China overcome problems in export markets and increase domestic consumers' confidence in horticultural products.

<sup>64</sup> Exports are still a small fraction of China's total production of these products.

<sup>65</sup> Many exported horticultural products are processed products, such as juices and canned, dried, pickled or frozen fruits and vegetables.

<sup>66</sup> Exports to Japan—China's largest food export market—plunged in 2008 after pesticide-contaminated dumplings sickened Japanese consumers and eroded confidence in foods imported from China.

Figure 16  
**China's exports of horticultural products grew rapidly after 2001\***



\*Date of China's WTO accession.  
 Source: Economic Research Service calculations based on China customs statistics.

Other issues may serve to slow growth in horticultural production. China's continued economic growth increases wages in rural areas, eroding the profitability of labor-intensive crops. In other countries, horticultural production often relies on migrant labor: workers that arrive in time for the busy season, typically for harvest and processing, then move away until the next year. These types of periodic labor markets have yet to develop in China, constraining many regions to cultivate only as much labor-intensive crops as they can harvest with local, sometimes household, labor resources.<sup>67</sup> Subsidies provided to grain producers may serve to limit land going into horticultural production, but thus far these subsidies are insufficient to make grains, on average, even remotely as profitable as horticultural crops.

Other policy changes may promote horticultural production in China. Reforming land tenure and credit policies may increase the efficiency of China's horticultural production, cause farmers to shift production to horticultural crops, and even help China resolve food safety issues in horticultural products. Clarifying land rights to make land transactions more market-based would raise the opportunity cost of the land and induce farmers to shift land to higher value uses (similar to water). Land tenure policies that allow farmers to specialize and aggregate land into horticultural production will reduce costs and improve standardization. The development of farmer organizations could also serve this role. Both larger farms and farmer organizations, independently or together, would help producers bargain with marketing agents and processors to receive a larger share of the value of their production, facilitating rural income goals. Policies to provide credit for farm households may also help facilitate more modern production practices.

## Livestock Products

As with horticultural products, China's consumption of livestock products has grown rapidly in recent years, and these products are predominantly

<sup>67</sup> This also causes households and regions to produce multiple horticultural crops with different harvesting and processing needs so they can sequence these busy seasons, rather than specialize in one or two crops.

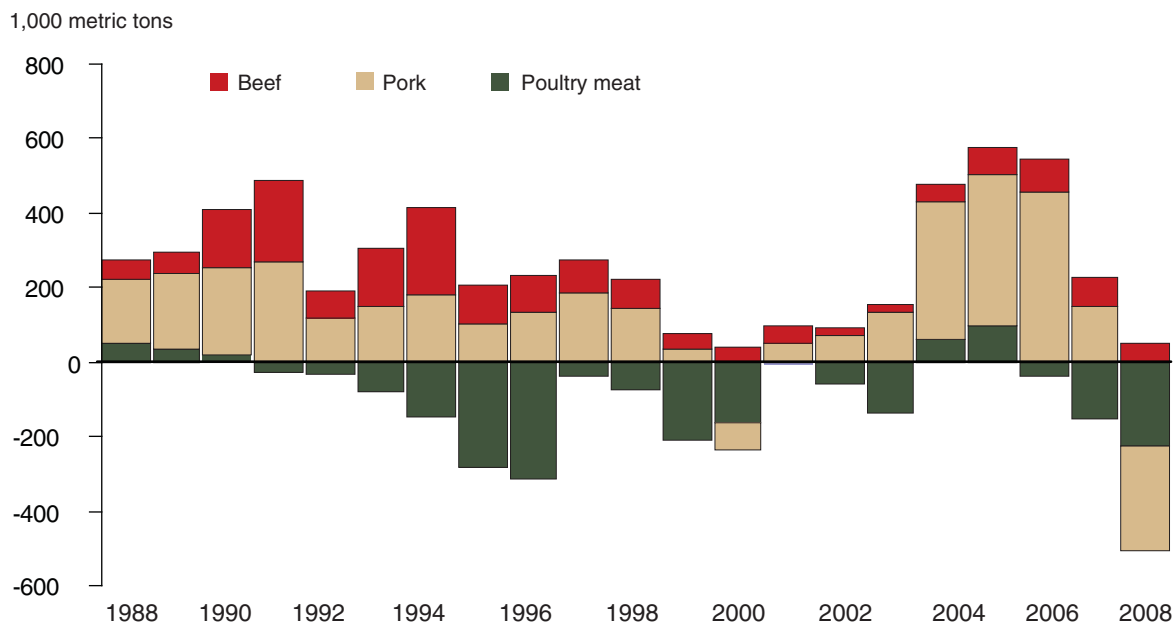
supplied by domestic producers. China's consumption of pork, poultry, beef, and fish will continue to grow as incomes and urbanization increase. Per capita meat consumption by China's wealthiest households, however, appears to have peaked at relatively low levels (Gale and Huang, 2007). These low levels of consumption in China's high-income groups suggest that the potential for greater meat consumption may be weaker than indicated by forecasts that used per capita consumption in other developed Asian countries as their benchmark. Food safety concerns and outbreaks of animal diseases periodically disrupt meat, poultry, dairy, and fish consumption and could be a limiting factor for growth in both production and consumption.<sup>68</sup>

Despite growing domestic demand, China has been a net exporter of livestock products in most years (fig. 17). China imports mostly livestock products that are low-value in the United States, such as chicken feet, wing tips, and offal. Pork imports surged temporarily between 2007 and 2008 when China's hog sector experienced a severe downturn, but pork imports are minimal in most years. China also imports some dairy products. Demand for beef is growing, but China has not imported beef directly from the United States since the December 2003 discovery of BSE in a dairy cow in the United States. China also exports poultry, pork, and aquaculture products. Production tends to expand and contract cyclically in response to price fluctuations and periodic disease outbreaks. Officials in many areas promote livestock production as a rural development program, but many farmers are abandoning traditional "backyard" modes of livestock production. The emergence of large Chinese meat and dairy companies in recent years has pushed development of more modern livestock production by large- and small-scale farms.<sup>69</sup>

<sup>68</sup> The 2004 outbreak of avian influenza in China caused Chinese poultry consumption to fall significantly, even though humans cannot contract the disease from eating cooked poultry products.

<sup>69</sup> A recent report by China's Ministry of Agriculture states that roughly half of China's pork production comes from producers with 50 head or more, a much larger percentage than only a few years ago.

Figure 17  
China's net exports of beef, pork, and poultry



Note: Negative numbers indicate net imports.  
Source: U.S. Department of Agriculture, Foreign Agricultural Service, Production, Supply and Distribution Data, November 2007, accessible at <http://www.fas.usda.gov/psdonline/psdHome.aspx>.



China's transformation from predominantly backyard production to more modern production facilities operated at the village level will be facilitated directly by the availability of rural credit and development and extension of technology. A small share of livestock production is produced in large, fully modernized production facilities with temperature-controlled buildings, compound feeds, and use of growth hormones, particularly in poultry production.<sup>70</sup> Household production is increasingly seen by policymakers as inefficient, and the waste from these operations contributes to environmental and water quality issues in rural areas. Thus, the Ministry of Agriculture (MOA) is engaged in a program to facilitate the consolidation of these efforts at the village level to improve their technological sophistication and curtail environmental effects. Increased availability of rural credit will assist in these efforts.

Other efforts to improve livestock production efficiency include development and importation of improved breeds. China's research institutions put less emphasis on developing livestock varieties than on seed varieties, but China has imported breeding stock to cross with domestic breeds in an effort to improve their weight gain performance and meat quality. These enhancements, along with the MOA's attempts to improve the sophistication of production at the village level, will increase China's production efficiency in livestock products.

## Oilseeds and Feed Grains

As China's livestock production grows and develops, the demand for feed grains and protein meals will almost certainly increase. Given China's emphasis on maintaining self-sufficiency for food grains, the production of food grains will likely take precedence over the production of feed grains and oilseeds. Oilseed imports are already large after skyrocketing over the last decade. China has long been a corn exporter, but corn exports have fallen and imports could occur more regularly.

### *Oilseeds*

Oilseeds and vegetable oils are among China's most important imports. China's soybean imports were negligible in the mid-1990s and reached 37 million metric tons during calendar year 2008. Soybean imports totaled \$21.8 billion in 2008, including \$8.4 billion from the United States, and imports of fats and oils totaled \$10.8 billion (U.S. dollars). Vegetable oil imports include palm oil from Southeast Asia and soybean oil from Argentina, Brazil, and the United States. China's soybean import boom has been driven by demands for vegetable oil and soymeal as a high-protein component of animal feed.<sup>71</sup> The rising demand for vegetable oil and livestock feed is expected to continue, and China will rely on imports to meet this demand.

Research institutes in China are developing biotech soybean varieties, but unlike the United States and Brazil—the world's two largest soybean producers and China's primary suppliers for soybeans—China's Government has yet to approve any of these varieties for production. Yields for China's domestically developed biotech soybeans lag behind internationally available varieties, and this lag is one reason why China has yet to approve

<sup>70</sup> Many of these hormones are legally banned in China, but illegal use is common.

<sup>71</sup> Until recently, China was a net exporter of soymeal, but still an importer of soyoil, indicating that the recent growth in soybean imports was driven more by demand for soyoil than for soymeal.

domestic varieties. There are also concerns, however, over the effects of biotech soybeans in direct human consumption. Most of China's domestically produced soybeans are used to make tofu and other food products.<sup>72</sup> Once China improves its domestic biotech varieties to match internationally available biotech varieties, these varieties will likely be approved for production. If China were to adopt biotech varieties that match current yields, the adoption of these varieties would lower production costs and make soybeans more profitable, resulting in expanded acreage, higher domestic production, and lower demand for imports. The expanded acreage, however, would divert acreage from corn production, possibly increasing the demand for corn imports.

Policy support for grains affects China's production of oilseeds. Price supports and subsidy policies for grain shifted crop plantings from soybeans and rapeseed to corn, wheat, and early rice in 2007. Thus, support for grain is one factor behind the surge in oilseed and vegetable oil imports. In 2008, China expanded price supports and subsidies for soybeans and rapeseed to spur a recovery in oilseed production.

### ***Corn***

China is the world's second largest corn producer (the United States is largest). Its corn consumption for animal feed and industrial uses has been growing faster than that of rice and wheat.<sup>73</sup> Production has risen as well, as grain area shifted from food grains to corn. Despite growing demand, China has not imported significant quantities of corn since the mid-1990s. China's corn exports fluctuate from year-to-year, depending on Chinese policies and trends in international versus domestic prices (Gale, 2002; 2004). Chinese corn competes directly with U.S. corn in South Korea and other Asian markets. China's continued increase in corn consumption for feed and industrial uses will curb China's corn exports and may turn China into a corn importer.

Industry estimates suggest that corn use for animal feed has been growing at a moderate pace. Livestock feed accounts for about two-thirds of China's corn demand. Revised statistics released in 2008 by China's National Bureau of Statistics indicate that meat production rose about 3 percent per year from 1997 to 2007. Farmers in China primarily raise hogs and poultry, which convert grain to meat more efficiently than beef cattle. Corn accounts for approximately 30 percent of total livestock feed. Chinese farmers use a variety of other feeds, including wheat, rice, bran from milling these grains, sweet potatoes, fish meal, oilseed meals, and byproducts from starch and alcohol production. Chinese cattle and sheep graze in pastures, at the edge of fields, and near roadsides, consuming relatively little grain. Because of the variety of feeds used, farmers are sensitive to corn-feed prices. Livestock production, however, is modernizing and the share produced by individual households is falling as China shifts to more commercial operations. Commercial operations rely more on corn and soybean feeds, but also improve the conversion ratios to reduce feed demand per unit of meat produced. Current policies to extend credit to rural areas may facilitate the modernization of the livestock sector and have spillover effects in the corn and soybean markets.

<sup>72</sup> China also exports a small amount of soybeans for human consumption, including those exported to the United States.

<sup>73</sup> In recent years, the fastest growing component of corn demand in China has been for industrial production of starches, corn sweetener, and alcohol.

Corn yields in China have significant capacity to improve, much more than for wheat and rice. China's corn yields are less than 5 metric tons per hectare (2 mt/acre), far below the United States with yields closer to 9 metric tons per hectare (3.6 mt/acre). Thus, the development and adoption of new, higher yielding varieties could significantly improve China's total corn production.<sup>74</sup> Improved agricultural technologies, including biotech varieties of corn, could boost corn yields and stave off import demand.<sup>75</sup> Improved extension services and seed industry regulation could facilitate the development and dissemination of newly developed varieties. Larger plots or development of viable producer associations could also facilitate the adoption of improved varieties by lowering research costs or raising the aggregate benefit of selecting improved varieties.

## Cotton, Hides, and Skins

Another major area of agricultural imports for China in recent years has been inputs into the world's largest textile, clothing, and shoe manufacturing industry. China's production of these products not only serves the growing demand of 1.3 billion increasingly wealthy consumers, but also produces the world's largest exports of these products. China's export of these products grew throughout the 1990s, then surged after WTO accession in 2001.<sup>76</sup> While China is by far the world's largest consumer of these inputs, it is unclear how much goes into products sold domestically versus how much is re-exported, and this is a major component of uncertainty on international markets for these agricultural inputs.

Exchange-rate adjustment, rising labor costs in China, and slowing growth in the global economy, may affect imports of cotton, hides, and skins. After holding its exchange rate fixed for over a decade, China began allowing its currency to float upward against the dollar in July 2005 (Gale and Tuan, 2007). In the ensuing 3 years, the Chinese *Yuan* (CNY) gradually appreciated about 20 percent against the dollar, raising the cost of exports from China. At the same time, China's labor costs have been rising at double digit rates and enforcement of labor and environmental regulations has been tightened, further eroding China's international competitiveness in labor-intensive industries like textile and shoe manufacturing. These factors could slow China's export growth and temper China's demand for cotton and hide imports. A lack of reliable statistics on domestic Chinese textile and shoe production, however, has made it difficult to assess whether growth in demand by China's domestic consumers will keep its production boom going.

### Cotton

China has been a major cotton importer since WTO accession in late 2001, particularly since the end of the MFA in 2004. Under China's WTO obligations, cotton is imported under a Tariff-Rate Quota (TRQ) regime similar to grains. Starting in 2003, however, China has imported cotton well beyond its 890,000 mt TRQ without imposing the prohibitive 40 percent out-of-quota tariff, providing support to its surging textile industry.<sup>77</sup> Cotton imports were 2 million mt or more each year from 2004 to 2008, and peaked at 3.6 million mt in 2006.

<sup>74</sup> Much of China's corn on the North China Plain, however, is double-cropped with winter wheat or vegetable crops and planted in June rather than in the spring, creating a much shorter growing season than U.S. corn.

<sup>75</sup> China has developed biotech corn varieties, but has yet to release them.

<sup>76</sup> China's WTO accession in 2001 allowed China to be included when the Multifiber Arrangement (MFA) was lifted in December 2004 which, until that time, imposed quotas on China's and other WTO member's exports of textile products to developed countries. Since 2001, China's textile exports have tripled, resulting in soaring demand for cotton, hides, and skins as inputs into this manufacturing bonanza.

<sup>77</sup> China has instead applied a complex "sliding scale" tariff on imports beyond the TRQ, which in practice has ranged from 5 to 25 percent.

China's domestic cotton production has little capacity to expand unless it encroaches on area sown to other crops. Conversely, grain subsidies and other policies to maintain grain production could limit the expansion of cotton production in many areas. China's cotton production has already benefited greatly by biotech *Bt* cotton varieties that are relatively resistant to bollworm, so future gains from technology development will be lower than for other crops where such technologies have yet to be adopted. Cotton production in China depends on irrigation, but cotton uses less water than grain crops and also grows through the summer rainy season in the eastern production region, so it is less sensitive to disruptions in supplemental irrigation than wheat. Cotton production in the western Xinjiang region depends on water from snow pack in the surrounding mountains, and this snow pack is widely believed to be threatened by climate change (see fig. 9).

### ***Hides and Skins***

In recent years, China has imported more than 2 mmt of hides and skins annually. The value of hides imported from the United States exceeds \$800 million annually. Like cotton, these products go into the manufacture of consumer items, primarily shoes and clothing, much of which are re-exported. Since China's beef industry is significantly smaller than the United States', demand for hide imports will likely continue. Processing hides and skins, however, can have negative environmental consequences, particularly on water quality. Recent efforts to improve environmental stewardship threaten the continued processing of hides and skins in China.

**A ship loaded with containers is berthed at Qingdao, China's leading port for trade in agricultural products**



Photo by Fred Gale, Economic Research Service.