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# China's Growing Demand for Agricultural Imports

Fred Gale, James Hansen, and Michael Jewison





United States Department of Agriculture

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## Abstract

This report examines China's recent emergence as a major agricultural importer and its implications for global markets. It analyzes trade patterns employing U.S. and Chinese trade statistics, summarizes alternative projections of future imports, and discusses how Chinese officials are adjusting their strategic approach to agricultural trade as imports grow. A strong agricultural trading partnership has developed between China and the United States that is likely to persist into the future. However, Chinese interventions to preserve self-reliance create volatility and uncertainty that can disrupt markets.

Keywords: China, agricultural imports, soybeans, grain, meat, dairy, projections, policy

## Acknowledgments

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# China's Growing Demand for Agricultural Imports

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## What is the Issue?

China is playing an important role in global agricultural markets as it emerges from isolation, liberalizes its economy, and experiences rising living standards. Policymakers, analysts, researchers, and the public need information about China's growing, multifaceted role in agricultural markets. For example, what countries are the leading suppliers of China's agricultural imports? What commodities is China importing, and what trends and patterns can be discerned? How do China's current agricultural imports fit in its historical context? How have China's policies responded to its increased role in global agricultural markets? Can import growth be sustained in the future or will it be limited by new policies and procedures?

China's capacity to meet new demands for agricultural products has been assessed by analysts inside and outside China since the 1980s. Economists have anticipated that market forces would induce China to import grains and other land-intensive crops, but Chinese officials (motivated by food security and other concerns) have long resisted these forces and sought to maintain self-sufficiency. However, officials are now adjusting their strategies to accommodate their country's growing reliance on agricultural imports.

## What Did the Study Find?

China's 2001 accession to the World Trade Organization lowered barriers to agricultural imports, and its economic growth has generated new demands for agricultural commodities. An agricultural trading relationship of mutual importance is developing between the United States and China. The United States accounted for over 24 percent of the value of China's agricultural imports during 2012-13, a larger share than any other country. U.S. agricultural sales to China doubled from 2008 to 2012, reaching nearly \$26 billion in annual sales. China has overtaken Japan, Mexico, and Canada to become the leading export market for U.S. agricultural products.

China's agricultural imports reflect its relative scarcity of land resources, and its most prominent imports are oilseeds, oils, and cotton—products that have high land requirements per unit of output. China has become a net importer of grain, but its grain

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imports are still modest in comparison with its oilseed imports. China has also swung from net exporter to net importer of corn and is importing large volumes of distillers' dried grains, a byproduct of corn-based ethanol production. While demand for animal feeds is an important factor in China's agricultural import growth, imports of meat and dairy products have also surged as rising costs of feed and forage, as well as other constraints, limit the growth of domestic livestock output.

Demand for imported cotton and wool fibers as raw material for textile manufacturing has also risen. When China stockpiled domestic cotton to support prices above world levels during 2011-13, cheaper imports of cotton surged to meet textile demand.

While bulk commodities remain predominant in China's agricultural imports, evolving consumer tastes and increased purchasing power are stimulating demand for higher value products. Imports of wine, beer, cheese, breads, cookies, extracts of coffee and tea, and ice cream are growing rapidly.

Projections by the U.S. Department of Agriculture (USDA) and several other sources anticipate continued growth in Chinese agricultural imports through 2023. Soybeans are expected to continue as the dominant import commodity, but imports of corn and meats are expected to rise as well. However, an unanticipated surplus of corn that was evidenced in China soon after projections were made underscores the difficulty of assessing China's market.

Officials in China now acknowledge their country's need for agricultural imports and are emphasizing agricultural trade and investment in diplomacy. They are also formulating strategies to use domestic support and border measures to prevent imports from dominating Chinese markets. However, interventions in markets can create uncertainty that distorts prices and disrupts trade. On the other hand, policies that allow market demand and supply to determine prices, combined with the consistent application of regulations and standards, generally help global markets to supply demands efficiently.

## **How Was the Study Conducted?**

The study is based on an analysis of China's agricultural imports reported in Chinese customs statistics and U.S. agricultural export data; it evaluates recent trends in data through calendar year 2013, as well as historical trends. The study also summarizes projections of Chinese agricultural imports through 2023 from four sets of projections and summarizes Chinese policies on food security and agriculture based on information from numerous Chinese documents, speeches, and news media reports.

# China's Growing Demand for Agricultural Imports

Fred Gale, James Hansen, and Michael Jewison

## Introduction

China's demand for imported raw materials and foods is critical to any assessment of global agricultural trade patterns. Industry and government leaders around the world have long anticipated China's important role in agricultural markets, but China's import demand has evolved in unexpected ways and remains difficult to predict.

China's imports of grain and cotton surged as economic reforms began in the late 1970s (Surls, 1982). During the 1980s, Chinese leaders also discussed strategies for upgrading the Chinese diet by boosting intake of animal protein, and they targeted industries that use agricultural raw materials for expansion to create employment. Studies of changing food consumption patterns commissioned by the Chinese Government during the 1980s anticipated significant deficits in grains, meats, and vegetable oils by the end of the 20th century (China Mid- and Long-Term Food Development Strategy Team, 1990; Ding, 1991).

During the 1980s and 1990s, international attention focused on China's demand for agricultural imports as the country emerged from isolation and allowed economic forces to allocate resources (Crook, 1988; Yang and Tyers, 1989; Carter and Zhong, 1991; Garnaut and Ma, 1992). Brown (1995) drew attention to China's agricultural trade prospects by warning that China's rising consumption of animal protein and domestic resource limits would cause rapid growth in import demand and disrupt global grain markets. China's extended negotiations to join the World Trade Organization (WTO)—finally completed in 2001—brought even more attention to the topic.

China's accession to the WTO also generated additional projections, based on the principle of comparative advantage, that China would import more land-intensive crops (e.g., cereal grains and cotton) and export labor-intensive products (e.g., fruits and vegetables) (Anderson and Peng, 1998; Wailes et al., 1998; Lu, 1998; Huang et al., 1999; Chen, 2000; Carter and Li, 2002).<sup>1</sup> Studies seemed to form a consensus that China would import grain, but estimates varied widely; for example, Crook and Colby (1996) reviewed a dozen projections of China's grain imports for various years in the 21st century that ranged from 15 million metric tons (mmt) to over 200 mmt.

While China's gradual liberalization, rising living standards, and changing consumption patterns have been the main forces driving its production and trade, growth has been somewhat hindered by long-standing, deep-rooted preferences among Chinese officials for self-sufficiency. For example, a white paper issued by China's State Council (1996) called for China to remain at least 95 percent

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<sup>1</sup> The U.S. Department of Agriculture (USDA) anticipated that China's WTO accession would create substantial export opportunities for U.S. farmers that would increase demand and boost agricultural prices (Colby et al., 2000; Lohmar et al., 2002).



self-sufficient in grain by raising farm productivity, ensuring that prices are high enough to give producers strong incentives, reclaiming cropland, and utilizing crop straw and wastes to feed livestock. A number of studies noted that China's future trade would be influenced by restrictions motivated by self-sufficiency or other objectives (Crook, 1988; Yang and Tyers, 1989; Huang et al., 1999; Gale, 2002). Carter and Rozelle (2001) outlined different future scenarios for China's agricultural trade and development depending on agricultural policy and institutional-reform choices taken by Chinese leaders.

This tension remained after China's accession to the WTO, which Chinese officials viewed as necessary to create jobs and make further progress on market-oriented reforms, though they worried that China's farmers would be vulnerable to import competition (Han, 2011). Officials initiated plans to restructure the agricultural sector, and they pledged to use WTO-compliant measures to support farmers and insulate domestic industries from global market pressures (Niu, 2011).

In the years following WTO accession, China's gross domestic product (GDP) and household income grew rapidly, manufacturing and service industries absorbed large numbers of rural laborers, and agricultural production grew rapidly. The structure of food consumption changed to include more meat, dairy, and processed foods, much as the assessments during the 1980s predicted. China achieved remarkable increases in domestic agricultural production, as well. Grain production rose 40 percent during 2003-13 and reached the 550-mmt target for 2010 set by the Chinese Government (China State Council, 1996)—an achievement that China's Minister of Agriculture attributed mainly to policy support (Han, 2014).<sup>2</sup> Yet output of some other commodities that received less policy support also increased rapidly as producers responded to changing consumer demand. China's meat output increased by 32 percent, its milk output doubled, and its aquaculture production rose 50 percent during 2003-13.

Despite the increase in domestic output, China's role as an agricultural importer has grown. Tensions between market-driven resource allocation and the Chinese objectives of self-reliance continue into the 21st century. Rising imports prompted adoption of a new food security strategy that allows for imports to supplement China's domestic food supplies, but advocates the use of domestic support measures and trade barriers to keep the country self-reliant in food (Han, 2012; Han, 2013; Han, 2014). China's demand for agricultural imports is growing rapidly, but potential suppliers face obstacles and uncertainties (e.g., rejections of shipments, antidumping investigations, new requirements for exporters, opaque approval processes, and uneven application of inspection and quarantine regulations and procedures).

This report profiles recent patterns of growth in China's agricultural imports by summarizing Chinese customs data and U.S. agricultural export statistics. The data portray an important agricultural trading relationship between China and the United States and patterns of agricultural import growth broadly similar to those predicted by studies in earlier decades. Projections suggest that trade will continue to expand in a similar manner, but assessing China's demand for imports remains difficult due to inconsistent application of regulations, market-distorting interventions, and a lack of data.

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<sup>2</sup> The Chinese State Council's Development Research Center calculated that subsidies and other agricultural support expenditures rose from 390 yuan per metric ton of grain produced in 2004 to 1,120 yuan per metric ton in 2012 (Han and Jin, 2014). The 2012 value equaled \$178 per metric ton at the official exchange rate.

# China's Agricultural Imports Have Risen

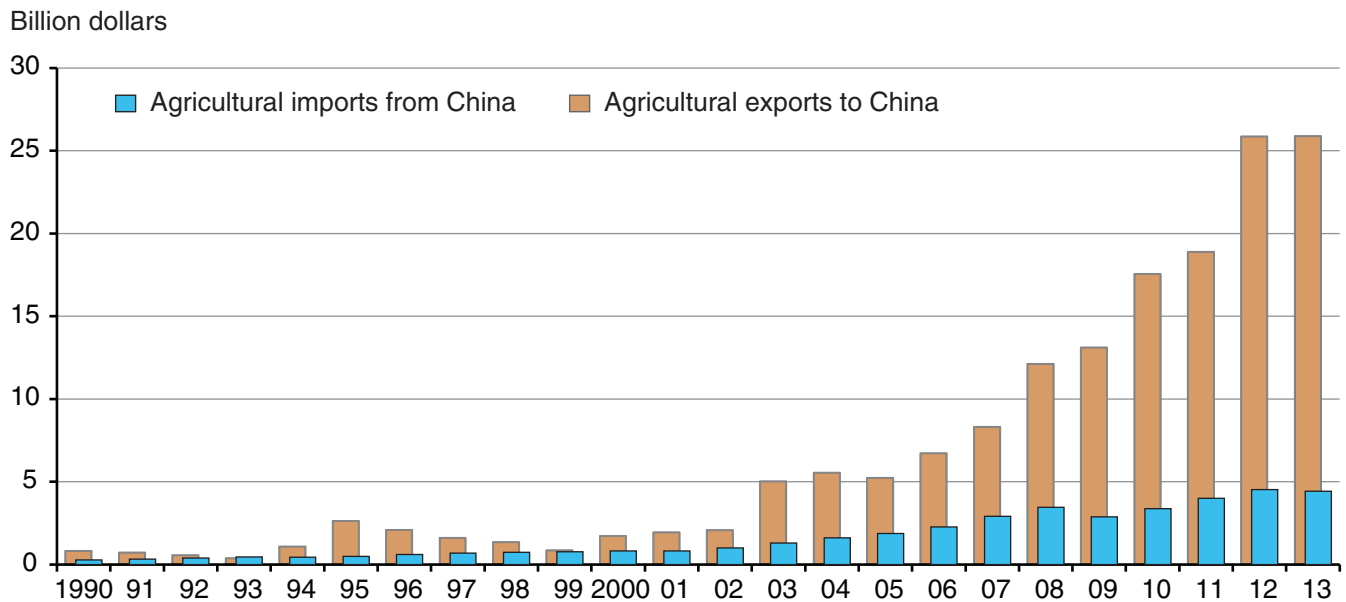
China's agricultural imports have risen dramatically in recent years, and the United States has become the leading supplier of these imports. Though China's import policies vary depending on the commodity (and show a marked preference for prioritizing self-sufficiency in cereal grains), it has been increasingly importing oilseeds, oils, cotton, grains, meat and dairy, and processed foods.

## U.S.-China Agricultural Trade Grew Rapidly

China's agricultural imports are of particular interest to U.S. farmers because the United States and other countries with rich endowments of farmland are positioned to supply farm products to China (where land is a relatively scarce factor of production). During the years immediately following China's WTO accession, annual U.S. agricultural exports to China surged from under \$2 billion to \$5 billion in 2005.<sup>3</sup>

In recent years, growth in U.S.-China agricultural trade has accelerated, and the two countries have become key trading partners in agricultural products. During calendar years 2012-13, U.S. exports of agricultural products to China averaged \$25.9 billion per year (fig. 1)—a tenfold increase from the late 1990s. Sales to China doubled during 2004-08 and doubled again during 2008-12. The share of U.S. agricultural exports going to China rose from 2 to 3 percent during the 1990s to 18 percent during 2012-13, and China is now the largest overseas market for U.S. farm products (up from number four in 2008) (table 1). U.S. imports of agricultural products from China rose at a slower

Figure 1  
**U.S. agricultural trade with China: 1990-2013**



Source: USDA, Economic Research Service analysis of data from USDA, Foreign Agricultural Service, Global Agricultural Trade System.

<sup>3</sup> This far exceeded the U.S. Department of Agriculture's estimates that China's accession to the World Trade Organization would boost U.S. agricultural exports by \$900 million (Lohmar et al., 2002) to \$1.6 billion (Colby et al., 2000) annually.

Table 1

**Top destinations for U.S. agricultural exports, 2008 and 2013**

Country/region	2008	Country/region	2013
	<i>bil\$</i>		<i>bil\$</i>
Canada	16.3	China	25.9
Mexico	15.5	Canada	21.3
Japan	13.2	Mexico	18.1
China	12.1	Japan	12.1
European Union-28	10.1	European Union-28	11.9

Source: USDA, Economic Research Service analysis of data from USDA, Foreign Agricultural Service, Global Agricultural Trade System.

pace, reaching \$4.4 billion in 2013—agriculture is one of the few sectors where the United States has a trade surplus with China.

All of China’s leading suppliers of agricultural imports are countries richly endowed with land resources: the United States, Brazil, Australia, Canada, New Zealand, and Argentina. China has been importing more agricultural products from many of these countries, but the United States remains the leader (fig. 2).

The United States is also one of the top three markets for China’s agricultural exports (fig. 3) and the only one of China’s leading agricultural export markets that is outside East Asia. However, China’s agricultural exports have grown at a much slower pace than its agricultural imports (see box, “China’s Agricultural Export Growth Diminishes”), and it has become a large net importer of agricultural products.

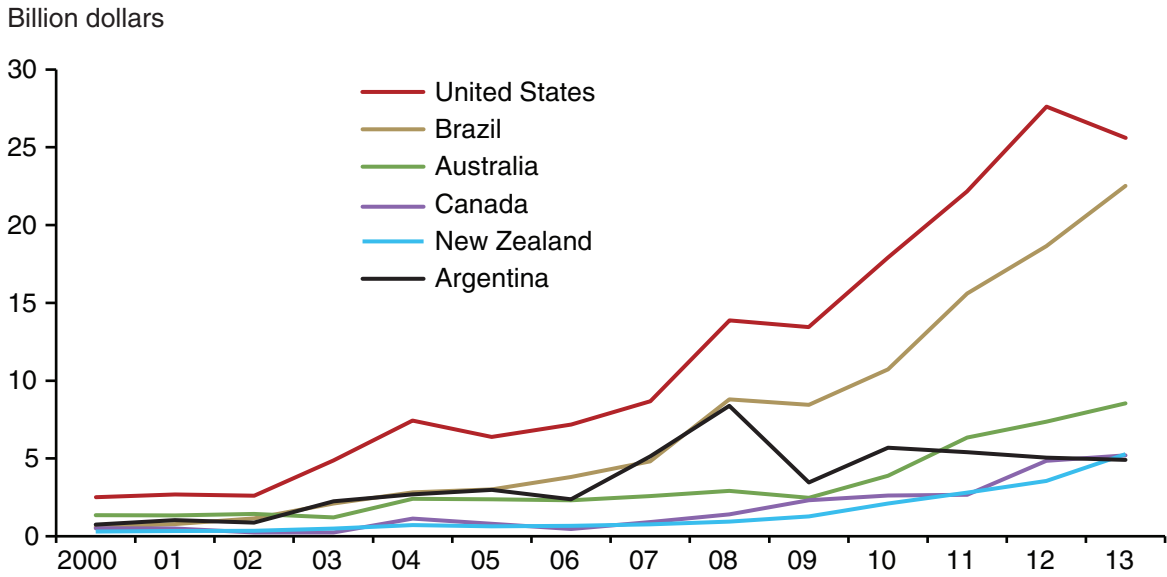
## The United States Is the Leading Supplier of Many Commodities to China

China’s excess demand for agricultural imports has been channeled into a few commodities that reflect rising consumer demand for vegetable oils, livestock products, and industrial raw materials. The United States, with its abundant land resources, has a competitive advantage in many of these products.

Soybeans, other oilseeds, and fats and oils represent nearly half of China’s agricultural import value (fig. 4). Soybeans and other oilseeds are processed to extract oils, and the residual meal is used as a high-protein animal feed ingredient. China also imports fats and oils that are refined and manufactured into consumer oil products. China produces most of its own meat and dairy products, but imports of these products are also significant. The mix of agricultural imports is diversifying as China’s purchases of fruits, nuts, cassava, sugar, wine, breeding stock, and processed food imports rise.

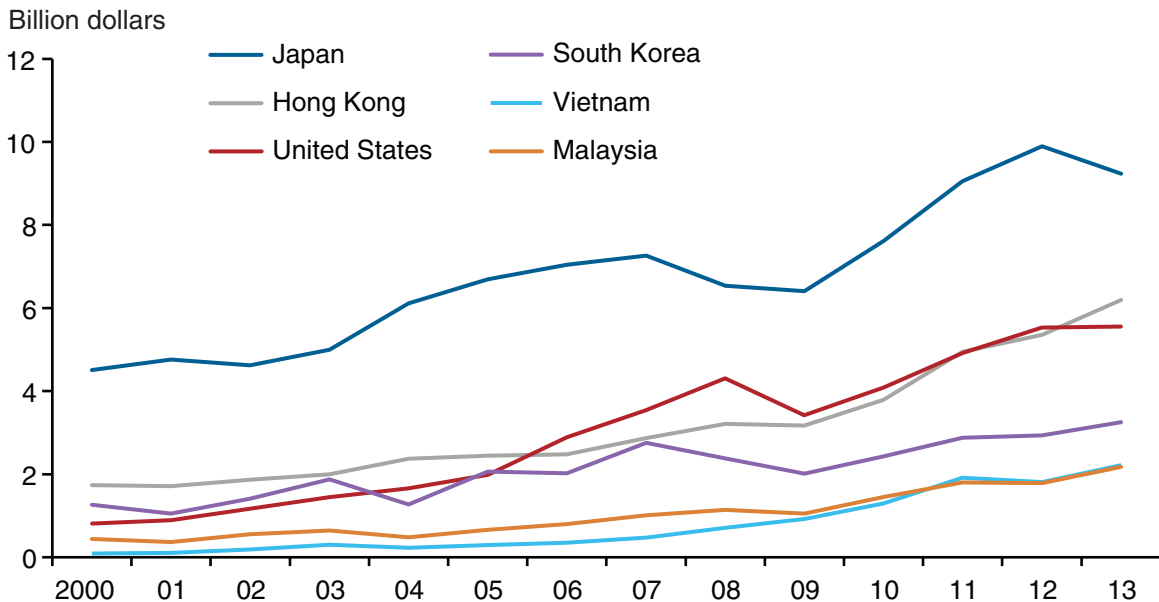
During 2012-13, the United States accounted for over 24 percent of China’s agricultural imports by value and was the leading supplier of its oilseeds, cotton, meat, cereal grains, cattle hides, distillers’ dried grains (mainly used for animal feed), and hay (table 2). The United States accounted for 36 percent of China’s oilseed imports, 42 percent of its grain imports, 30 percent of its cotton imports, and 25 percent of its meat imports. Soybeans comprise nearly all of U.S. oilseed exports to China,

Figure 2  
**China agricultural imports, by supplying country, 2000-13**



Source: USDA, Economic Research Service analysis of China's customs statistics reported by the Global Trade Atlas (2014).

Figure 3  
**China's agricultural exports to leading destinations, 2000-13**



Source: USDA, Economic Research Service analysis of China's customs statistics reported by the Global Trade Atlas (2014).

## **Box: China's Agricultural Export Growth Diminishes**

China's agricultural exports are chiefly labor-intensive, high-value (per unit of land) products that often require processing (Lu, 1998; Chen, 2000). U.S. imports from China include farmed fish and shellfish, canned mandarin oranges, garlic, mushrooms, soybeans for food use, apple juice concentrate, pet food, chicken feathers, noodles, tea, and spices (appendix 2). While products from China comprise a small share of the U.S. food supply, some of China's agricultural products have gained a significant share of the U.S. market (Gale and Buzby, 2009). Food safety hazards, such as antibiotic residues in fish and shellfish and adulteration of wheat gluten and dairy products, have also raised concerns.

China's agricultural export growth came from a combination of cost advantage and Government support. After WTO accession, officials in China formulated plans to boost labor-intensive exports (Han, 2011). Chinese authorities aided food processors in attaining internationally recognized certifications, and inspection and quarantine officials set up their own certifications for food exporters (Gale and Buzby, 2009). For example, China's apple-juice-concentrate exports dominated the global market following an initiative to promote apple production in western provinces, investment in processing, and assistance from inspection and quarantine authorities (Gale et al., 2009).

China's agricultural export growth has slowed in recent years due to various reasons. Certifications imposed higher costs on processors and farmers (Wang et al., 2009). Some Chinese industry associations imposed minimum prices to prevent price competition among exporters, which had prompted antidumping actions in overseas markets (Wang and Chen, 2011).<sup>1</sup> Rising vegetable prices in China also prompted industry and Government officials to place more attention on the domestic Chinese market (Gale et al., 2013). Additionally, a study of tomato sauce exports found that labor intensity had become a disadvantage after wages doubled during 2006-12 (Wang et al., 2013). The volume of tomato sauce exports peaked in 2009, and financial losses and plant closures were widespread in 2012.

However, agricultural officials in China continue to encourage exports. A program for agricultural export industries gives grants, loans, and technical assistance to companies and cooperatives that procure a commodity for processing and export from a base of farmers in a particular area. The projects emphasize implementation of food safety measures, quality standards, and developing brands and they include a variety of commodities (e.g., garlic, tomato sauce, flowers, bamboo products, fish, honey, and sunflower seeds).

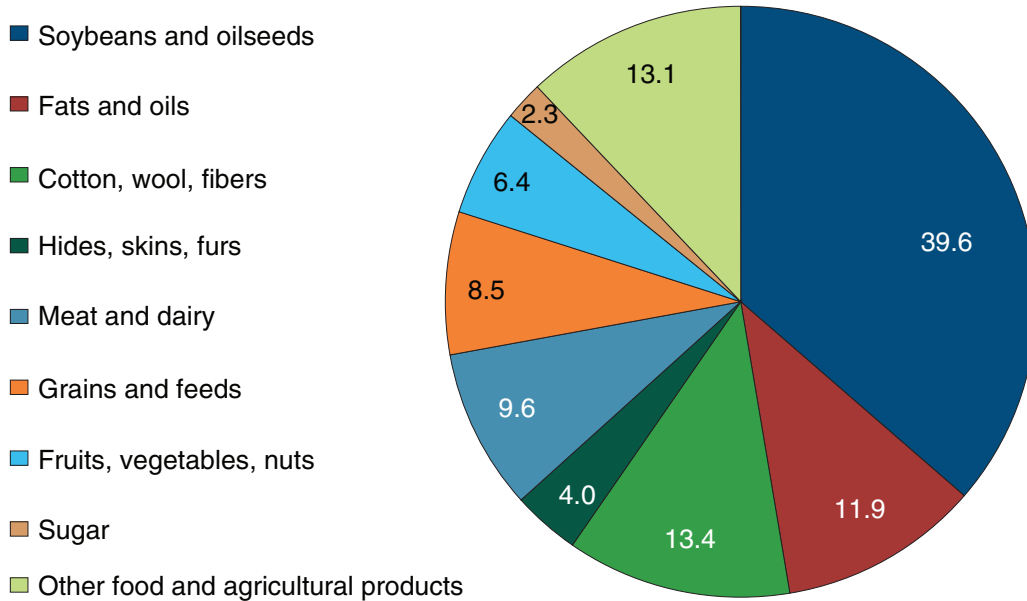
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<sup>1</sup>A U.S. court found that a Chinese association's minimum-price requirement for Vitamin C manufacturers violated U.S. antitrust laws (*Wall Street Journal*, 2013).

Figure 4

### China's imports of food and agricultural products

Annual average 2012-13 (billion dollars)



Notes: Chart shows the value of China's food and agricultural imports from all countries. The chart shows totals for categories 01, 02, and 04 to 24 from the Harmonized System codes (the global classification system used for customs statistics developed by the World Customs Organization), plus cotton, wool, hides, skins, and furs. Data are for calendar years. Fish and forestry products are excluded. Grains and feeds include animal feeds, as well as wheat and rice for human consumption. Cotton, wool, and animal hides are used as raw materials in the manufacture of nonfood consumer products.

Source: USDA, Economic Research Service analysis of China's customs statistics reported by the Global Trade Atlas (2014).

and they are the most prominent U.S. agricultural export to China (averaging \$14.1 billion during the 2012-13 calendar years, more than half of the total export value of U.S. agricultural exports). Soybeans are also the largest U.S. export of any type to China, accounting for about 11 percent of the value of all U.S. exports to China.

### China Has Become a Consistent Grain Importer

Chinese authorities place a high priority on self-sufficiency in grain, which is reflected in policies encouraging domestic production and limiting imports. Despite China's low per-capita endowment of cropland, it remained a net exporter of cereal grains—mainly corn—from the late 1990s until 2007. Since 2008, China has become a consistent importer of grains, and exports have declined (fig. 5). However, its grain imports of 13 mmt during 2013 were still much less than its soybean imports of 63 mmt.

During 2012-14, China's grain imports included corn, wheat, and rice, which were the focus of many of the 1990s analyses (fig. 6), as well as sorghum and barley. China consistently imported barley—mainly as a raw material for beer manufacturing—since the 1990s. Barley imports varied between 1.0 and 2.5 mmt each year from 2000 to 2013, with most coming from Australia, Canada,

Table 2

**U.S. share of China's leading agricultural imports, 2012-13**

Item	Average Chinese import value	U.S. share of China's imports	U.S. rank
	<i>\$ Billion</i>	<i>Percent</i>	<i>Number</i>
All agricultural products	109.0	24	1
Soybeans and other oilseeds	40.6	36	1
Fats and oils	11.9	2	11
Cotton	10.1	30	1
Meat	5.0	25	1
Cereal grains	4.9	42	1
Dairy	4.2	10	2
Fruit and nuts	3.9	13	4
Wine and beverages	3.1	3	7
Cattle hides	2.6	53	1
Wool	2.7	<1	13
Baking products	2.3	4	13
Vegetables	2.5	2	5
Sugar	2.5	5	5
Fish meal	1.7	15	2
Distillers' dried grains	1.1	99	1
Tobacco	1.4	11	3
Live animals	.5	15	3
Hay and forage products	.2	95	1

Source: USDA, Economic Research Service analysis of China's customs statistics reported by the Global Trade Atlas (2014).

and France. China also imports distillers' dried grains (DDGS), the byproduct of manufacturing fuel ethanol from corn. Net imports of grains and DDGS combined totaled 16 mmt during 2013 and grew to 24 mmt during 2014.

This import growth largely reflects China's growing demand for livestock and feed products. Soybean meal—an ingredient in animal feed—represents nearly 80 percent of the volume of soybean imports. Imported corn was used mainly for feed; DDGS and sorghum were imported largely as a substitute for corn when feed mills encountered difficulties importing corn. During 2014, a large increase in barley imports also reflected its increased use in animal feed. Significant amounts of domestic and imported wheat were also used as animal feed during 2012-13, when corn prices exceeded wheat prices.<sup>4</sup>

## Policies Affect the Mix of Imports

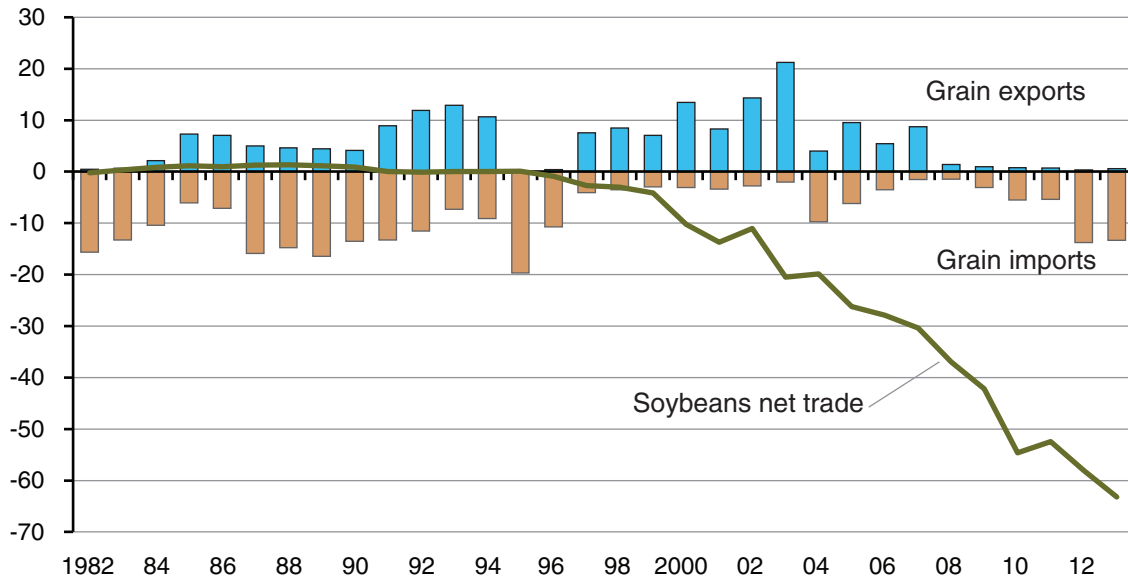
China's mix of imports also reflects policy decisions to promote feed imports and prioritize self-sufficiency in cereal grains. During the mid-1990s, officials cut tariffs and waived value-added tax

<sup>4</sup> The amount of wheat used as feed is unknown since there are no statistics on how wheat is used.

Figure 5

**China is now a net importer of soybeans and cereal grains**

Million metric tons



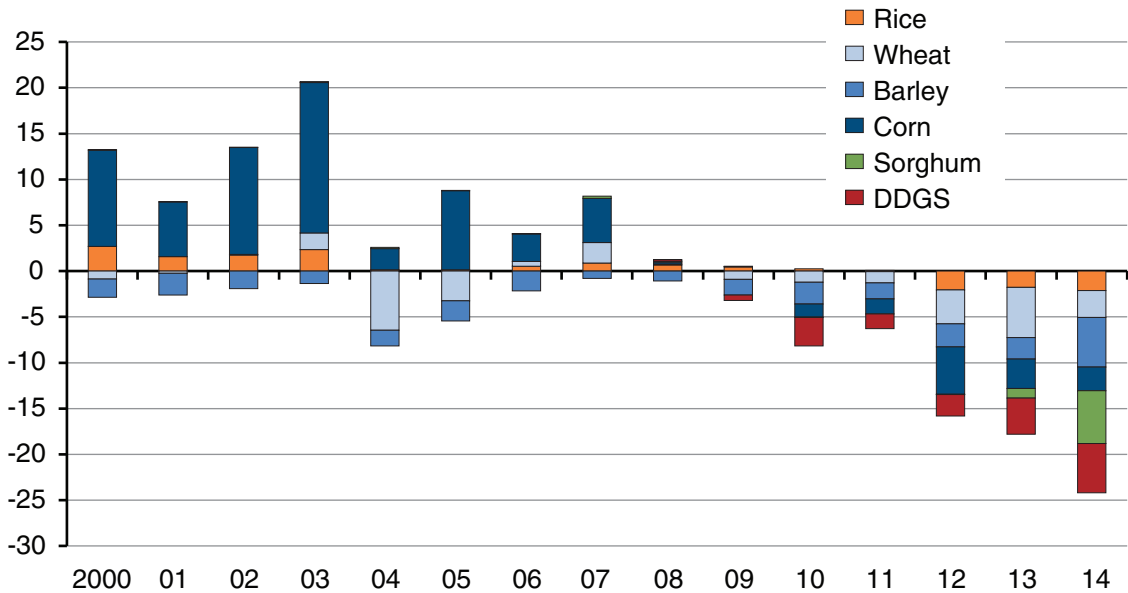
Notes: Cereal grains include wheat, rice, corn, barley, and sorghum. Net trade equals exports minus imports.

Source: USDA, Economic Research Service analysis of China Customs Administration (1984-1995) and the Global Trade Atlas (2014).

Figure 6

**China's net trade in grains, 2000-14**

Million metric tons



Notes: Net trade equals exports minus imports. Data are for calendar years. DDGS refers to distillers' dried grains. DDGS is not included in the traditional definition of grain since it is a byproduct of corn processing. However, it has emerged as a major U.S. export to China that is now bigger than any single grain.

Source: USDA, Economic Research Service analysis of China's customs statistics reported by the Global Trade Atlas (2014).



on imports of soybean meal, DDGS, and other grain-milling byproducts to address deficiencies in feed raw materials. During the years before and after WTO accession, the tariff on soybeans was also lowered to 3 percent and quotas were eliminated on imports of soybeans and vegetable oil.

China, however, retained stricter control over the imports of cereal grains. In its WTO accession, China agreed to tariff rate quotas (TRQs) for rice, wheat, and corn that allow limited quantities of each commodity to flow into the Chinese market at low tariffs. Low tariffs of 1 percent are set on imports up to the quota amount—set at approximately 5 percent of annual consumption—but imports outside the quota are assessed high tariffs of 65 percent.

The TRQ system was intended to open a more transparent trade channel than the internal quota and licensing systems previously used. However, Chinese authorities cite “management of TRQs” as one of the measures used to regulate the flow of imports (Ni, 2011, p. 79; Ni, 2012, p. 112; Xi and Yang, 2013, p. 446).<sup>5</sup> Most of the corn and wheat quotas are reserved for state-designated trading companies, and the remainder are distributed to thousands of potential importers in a cumbersome application process once a year (see box, “Feed Executive Calls for Reform of Import Quota”). Market analysts report that Chinese importers turned to DDGS, sorghum, and barley as alternatives to corn because there is no import quota for these commodities (Jewison and Gale, 2012). During 2014, news media reported that alleged problems with bribery in the distribution process had

### **Box: Feed Executive Calls for Reform of Import Quota**

Liu Yonghao, the founder and chief executive of China’s largest feed company, has publicly criticized the corn tariff rate quota (TRQ) system for favoring state-owned enterprises. In 2011, Liu criticized the TRQ system for reserving 60 percent of the corn import quota for a few state-owned companies, while hundreds of private companies like Liu’s account for 95 percent of China’s feed output (Zhang, 2011). Liu pointed out that the quota distribution mechanism divides the private share of the quota among applicants in 31 provinces and regions—just 90,000 tons per province. According to Liu, a single corn shipment has to be at least 50,000 tons to be economically viable. Liu said his company was awarded less than 3 percent of the quota during 2010 although his company accounts for 9 to 10 percent of China’s feed output. He said his company had to purchase a quota from a state-owned company that year. Liu called for allocating quotas to companies based on the volume of feed they produce.

Concerns about the TRQ system grew as the gap between Chinese and international grain prices widened during 2014, and Liu repeated his critique of the TRQ system at a meeting that year (*Xinhua News Service*, March 2014). Industry publications also raised concerns that the TRQ system placed small feed companies at a disadvantage (*Guangdong Feed*, 2014), and that flour mills cannot access the special types of wheat needed for the breads and snack foods that have become more popular in China (Zhengzhou Wholesale Grain Market, 2014).

<sup>5</sup> *Weihai Evening News* (2014) revealed that a Municipal Development and Reform Commission office distributed quotas for 22,700 metric tons of four commodities among six local companies and the office monitored market conditions to advise recipients when the quotas should be used.

prompted China's National Development and Reform Commission to consider using other methods to distribute the quotas (*Shanghai Pobo Financial News*, 2014).

China's domestic support has also focused on grains, including direct payments based on area planted in grain; support prices for rice, wheat and corn; and transfer payments to major grain-producing counties (Gale, 2013). Price supports were introduced for soybeans, rapeseed, and cotton, but persistently higher returns for grains resulted in land shifting to grain. China's Minister of Agriculture asserted that Government policies produced 10 consecutive increases in grain production during 2003-13 (Han, 2014).

China's corn imports were disrupted during 2013-14 when inspection and quarantine officials began rejecting U.S. corn shipments containing a genetically modified corn variety that agricultural officials had not approved. The rejections began in November 2013 and continued until the variety was approved in December 2014. By mid-2014, officials said they had rejected 1.25 mmt of corn shipments. During July and August of 2014, Chinese authorities also issued instructions to customs officials to closely scrutinize sorghum and barley imports for a variety of potential problems (AQSIQ, 2014; Niu and Patton, 2014). Officials also began to check DDGS and alfalfa shipments for unapproved genetically modified varieties, and uncertainty about Chinese approval of shipments continued throughout 2014.

## Meat and Dairy Imports Are Surging

Most of the 1990s assessments of China's commodity demand anticipated that China would import feeds to support a growing livestock herd. Now China's imports of livestock products are also rising.

China's imports of meat and animal offal rose to over 2.5 mmt during 2013 (fig. 7). Pork meat and offal are the largest types of meat imported. Pork imports first surged during 2007-08, a period of tight supplies and soaring prices following a swine<sup>6</sup> disease epidemic in China, and pork imports rose further as Chinese pork prices climbed during 2011-13. China also became a significant importer of beef and mutton during 2013 as domestic prices for these meats soared.<sup>7</sup> China's poultry imports, on the other hand, fell in 2010 following an antidumping action against U.S. poultry.<sup>8</sup>

China's imports of dairy products grew more than fourfold from 2008 to 2013, reaching 1.6 mmt (fig. 8).<sup>9</sup> About half of the imports consist of milk powder used to manufacture infant formula and other milk products, while whey is used in various processed food and animal feed products. China has also become a significant importer of other types of dairy products like cheese, butter, buttermilk, and yogurt.

Rising demand, slow growth in domestic supply, and growing costs of feed, labor, and land are pushing domestic meat and dairy prices higher, which makes imported meats more competitive in China. China's retail prices for beef and mutton rose 85 percent during 2009-13, while pork and poultry prices rose about 30 percent. Chinese livestock production is also shifting from traditional

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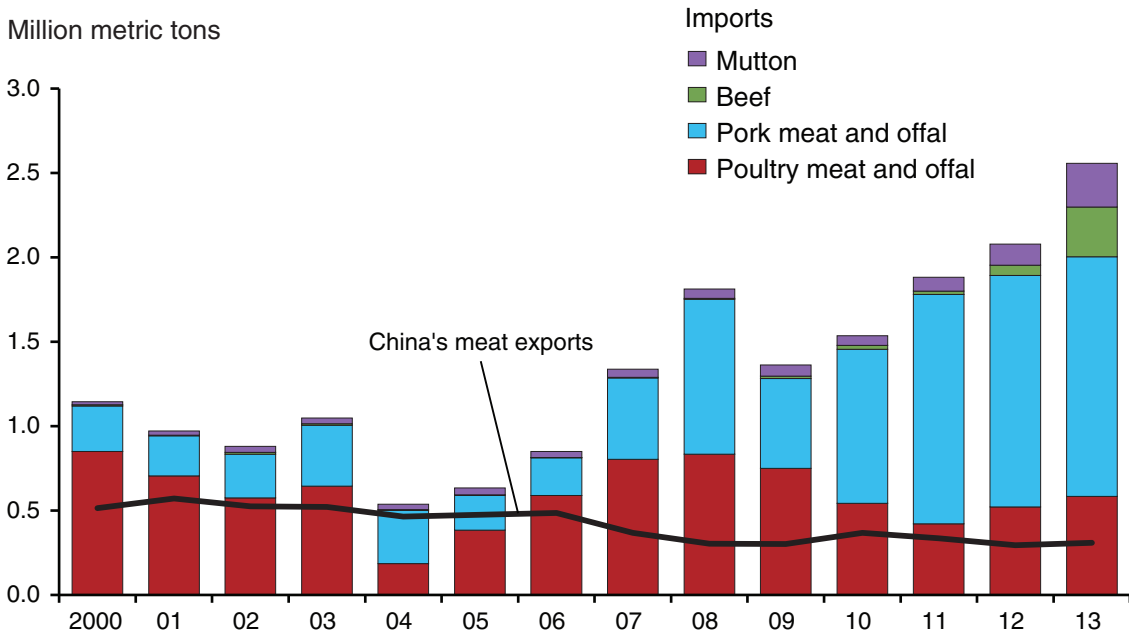
<sup>6</sup> Swine refers to animals; pork refers to their meat.

<sup>7</sup> China has banned imports of U.S. beef since 2003, when a case of bovine spongiform encephalopathy occurred in the United States.

<sup>8</sup> The dip in China's poultry imports during 2004-05 was the result of an avian influenza epidemic that depressed domestic consumption and prices. China also banned imports from some countries during that period.

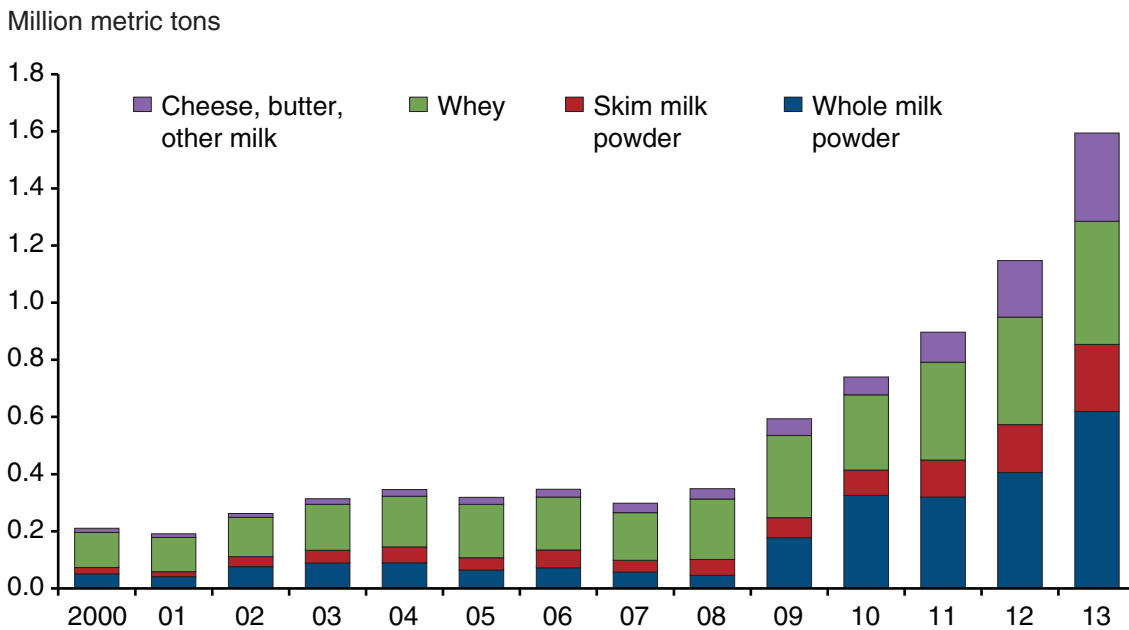
<sup>9</sup> Imports are on a product-weight basis, not milk equivalent.

Figure 7  
**China's meat imports and exports, 2000-13**



Source: USDA, Economic Research Service analysis of China's customs statistics reported by the Global Trade Atlas (2014).

Figure 8  
**China's dairy imports, 2000-13**



Source: USDA, Economic Research Service analysis of China's customs statistics reported by the Global Trade Atlas (2014).

small-scale, backyard production to larger scale, concentrated modes of production. Larger scale farms tend to use commercial feeds and have higher fixed costs, and they face challenges acquiring land and managerial talent. Livestock farms are also facing higher costs from more stringent enforcement of environmental and food safety regulations, including a new regulation on hog-farm waste disposal that took effect in 2014.

Imports of animal breeding stock also reflect the influx of commercial-scale livestock farms in China. The value of live animal imports was in the range of \$40 to \$50 million annually during 1995-2002, but it exceeded \$400 million in 2013. Cattle accounted for 60 to 70 percent of live animal imports from 2009 to 2013 as new dairy operations stocked their farms with imported animals. Imports of poultry, swine, and other animals also increased rapidly in recent years; most of these are hybrids supplied by animal genetic companies to stock breeding farms.

However, China's feed imports still exceed imports of livestock products. One reason is the country's tariff structure, which favors imports of feeds over imports of meat and dairy products. China's tariffs on feed ingredients range from 1 to 9 percent, while tariffs on dairy and meats range from 10 to 25 percent (table 3). China's 2008 free trade agreement with New Zealand leveled the tariff bias against livestock imports to some degree by cutting tariffs on New Zealand milk powder and unboned sheep meat to 5 percent in 2013. The agreement will eventually phase out tariffs on both products—New Zealand is now the leading exporter of milk powder and sheep meat to China.

## Cotton Imports Are Volatile

China's industrial growth has also contributed to demand for imported cotton, wool, and animal hides. Demand for these raw materials is driven by similar forces—demand for exports and domestic sales of manufactured goods—but cotton imports have been much more volatile than imports of wool and animal hides.

Imports of wool and animal hides rose at a steady pace and were both near \$3 billion by 2013. Cotton imports, however, soared to nearly \$5 billion in 2006, plunged to \$2 billion in 2009, and soared again to \$11.8 billion during 2012 (fig. 9).

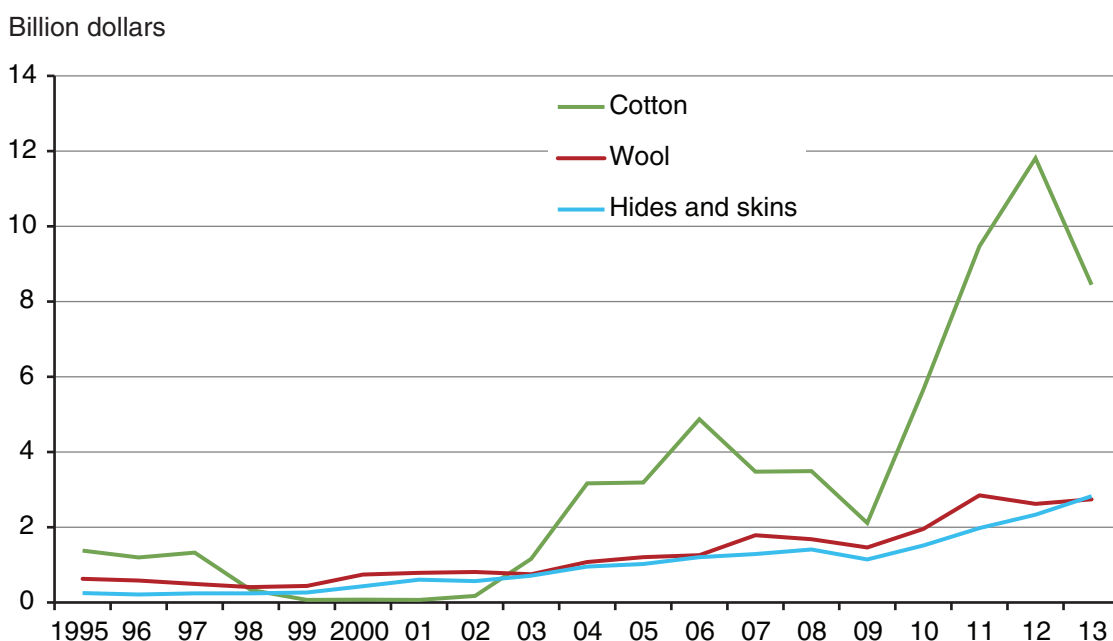
Table 3  
**China's tariffs on feeds, meats, and dairy**

Feed ingredients	Tariff	Dairy and meats	Tariff
	<i>Percent</i>		<i>Percent</i>
Corn*	1	Milk powder and butter	10
Sorghum	2	Frozen pork, poultry, and beef	12
Soybeans	3	Frozen mutton	15
Distillers' dried grains**	5	Sausage	15
Soybean meal	5	Chilled pork	20
Alfalfa	9	Smoked or salted meat	25

\*Within a quota of 7.2 million metric tons annually; over-quota tariff is 65 percent. \*\*Exempt from value-added tax.

Source: USDA, Economic Research Service analysis of China's WTO accession tariff schedule from the World Trade Organization (2001) and China's Ministry of Finance (2001).

Figure 9  
**Agricultural imports used as manufacturing raw materials**



Source: USDA, Economic Research Service analysis of China's customs statistics reported by the Global Trade Atlas (2014).

China is now the world's leading producer of cotton and the largest importer. China's cotton imports surged in response to growing textile output in the years after its WTO accession. China's textile exports and its cotton imports grew further after 2004, when the end of the global Multi Fibre Arrangement<sup>10</sup> removed the quotas on textile imports that had previously constrained China's textile exports to its major markets. China's cotton imports fell during a global economic slowdown in 2009, but they rebounded to record-high levels during 2011-13 as a cotton price-support policy held China's domestic cotton price far above the world price (Gale, 2013). Chinese authorities reported stockpiling nearly 16 mmt of cotton over 3 years from the domestic crop, while textile manufacturers seeking cheaper raw materials purchased record volumes of imported cotton.

### Imports of Processed Food Products Are Increasing Rapidly

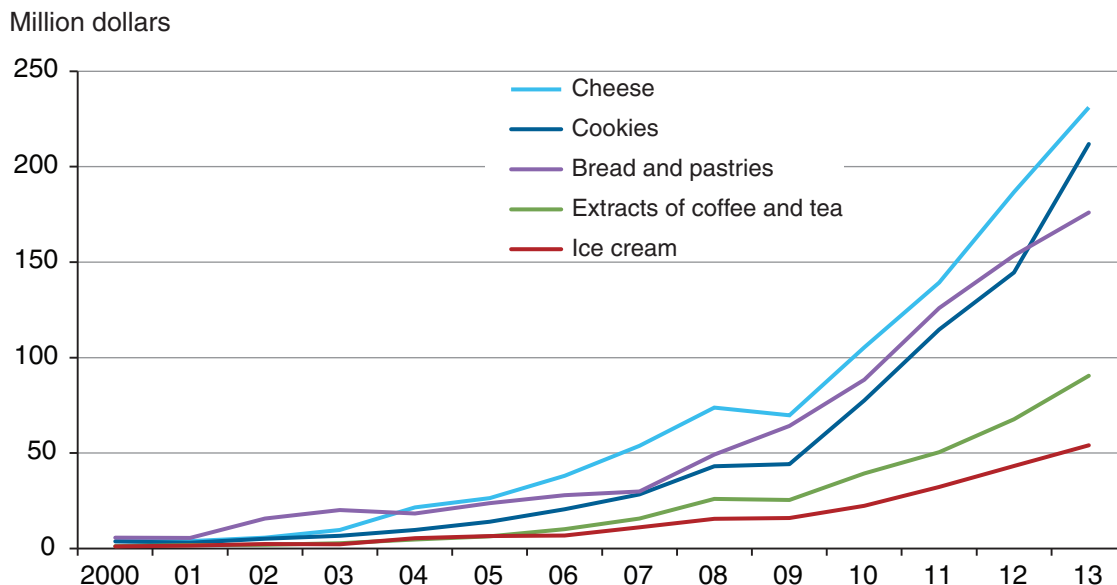
While bulk commodities and generic products used as raw materials for processing are still predominant, higher value foods and beverages comprise a rapidly growing share of China's agricultural imports. Imports of higher value items are increasing rapidly as living standards rise and the proliferation of food service and modern retail outlets creates new markets for such products.

The most prominent example is wine. China's imports of wine totaled \$1.5 billion in 2013, a four-fold increase from 2008. France has traditionally been the predominant supplier, accounting for 45 percent of wine import value in 2013, while the United States accounts for about 5 percent of China's wine imports. China's imports of brandy, whiskey, and other spirits also exceeded \$1 billion in 2013, while beer imports totaled \$232 million.

<sup>10</sup> An international agreement set by the General Agreement on Tariffs and Trade, which expired after 2004.

Imports of many other consumer-oriented food products are making inroads. For example, imports of cheese, cookies, breads and pastries, extracts of coffee and tea, and ice cream were negligible in the early 2000s but their value grew until interrupted by China's economic slowdown in 2008-09. The value of these imports grew more than threefold during 2009-13, and their combined value was \$764 million in 2013 (fig. 10).

Figure 10  
**China's imports of selected processed food products, 2000-13**



Notes: Harmonized System codes (the global classification system used for customs statistics developed by the World Customs Organization) used for these categories are cheese (0406), cookies (190531), bread and pastries (190590), extracts of coffee and tea (2101), and ice cream (2015).  
 Source: USDA, Economic Research Service analysis of China's customs statistics reported by the Global Trade Atlas (2014).

## Projections Anticipate Further Import Growth

USDA projections for 2014-23 anticipate a continuation of China's recent trends in agricultural trade. The projections are based on models of agricultural supply and demand that reflect changing consumption patterns tied to income growth, rising crop yields, and limited cropland area.

Despite rising wages and other costs, China is expected to remain the leading textile manufacturer and the key buyer of cotton in global markets. China will remain a relatively modest rice importer, while its wheat imports will rise to fill deficits in the types of wheat not widely grown in China (and which are needed for certain breads and processed foods).

The projections indicate that China will increase production of pork and poultry—the main consumers of commercial feeds—by a combined 15 mmt over 10 years, and imports of these meats will also rise modestly. The rising feed requirements of swine, poultry, and other livestock, however, are difficult to assess since the dietary needs of animals can be met through various commodities, a wide range of production practices are used in China, and information on supply and demand of both livestock and feed resources is often unavailable or unreliable.

The USDA projections anticipate that China will increase its imports of soybeans and feed grains to support rising domestic meat production. Expansion of ruminants—beef, dairy cattle, and sheep—is expected to put pressure on grasslands and forage resources, and China's increasing livestock numbers will require greater volumes of feed to supply energy, protein, and micronutrients. The need for protein in animal diets is a key consideration behind USDA's projections of continued robust growth in soybean imports. Liberalization of soybean meal and soybean imports during the 1990s eased a constraint on China's livestock production by supplying high-protein feed ingredients. The meal left over after extracting oil from soybeans will continue to be the primary source of protein to support growth in animal numbers over the next decade.

China is also expected to continue expanding corn production by increasing planted area and improving yields. However, the consumption of corn for feed, processed foods, and industrial products is expected to outpace supply capacity over the next decade. The supply of alternative feeds like brans and hulls of wheat and rice, tubers, and food wastes that traditionally supplied a significant share of energy to China's livestock is likely to grow only marginally. Thus, increased livestock output will rely on corn to a greater degree than in past decades.

Several other projections released during 2014 reflect a similar outlook of rising living standards and increased imports of major agricultural commodities (table 4). Ten-year projections by the Organization for Economic Co-operation and Development and the Food and Agriculture Organization of the United Nations (OECD/FAO), China's Academy of Agricultural Sciences (CAAS), and China's Research Center for Rural Economy (RCRE) all anticipated increases of varying magnitude in China's imports of corn, soybeans, and meat. USDA and OECD/FAO projected continued growth in soybean imports, but CAAS and RCRE projected modest increases that imply an abrupt slowdown in soybean import growth. A World Bank assessment (2014) also discussed the role of livestock products in China's dietary changes, as well as constraints on domestic supply response, and reported results of projections by the Center for Chinese Agricultural Policy that showed growing imports of soybeans, corn, and milk for 2020 and 2030.

Table 4

**Projections of China's imports of selected commodities in 2023**

Commodity	USDA	OECD-FAO	China Academy of Agricultural Sciences	China Research Center for Rural Economy
<i>Million metric tons</i>				
Rice	2.4	2.4	2.3	1.8
Wheat	5.5	2.8	3.1	5.7
Corn	22.0	16.9*	12.0	18.0
Soybeans	112.0	81.5*	74.0	75.0
Meat	2.4	3.6	2.4	NA
Cotton	4.6	3.3	1.6	3.0

\*OECD-FAO's corn projection is for all coarse grains; soybean projection is for all oilseeds. NA=Not available.

Notes: OECD/FAO refers to the Organization for Economic Co-operation and Development and the Food and Agriculture Organization of the United Nations.

Sources: USDA, Office of the Chief Economist, 2014; OECD-FAO, 2014; China Academy of Agricultural Sciences, 2014; Xu et al., 2014.

All of the projections expected China's imports of corn to rise beyond the country's 7.2-mmt tariff-rate quota for corn, implying that demand would be strong enough to prompt officials to install a mechanism to facilitate over-quota imports. However, soon after the projections were made, an unanticipated corn surplus in China became evident, suggesting that demand growth is not as rigid as presumed and underscoring the difficulty of assessing China's market (see box, "China's Unanticipated Corn Surplus").



## Box: China's Unanticipated Corn Surplus

China's emergence as a net corn importer, and robust demand growth during 2011 and 2012, influenced projections of its future corn imports by analysts (including those in China). Food security assessments formulated by Chinese officials during those years also anticipated a growing deficit between corn supply and demand (Han, 2012; Ni, 2013; Han and Jin, 2014).<sup>1</sup>

However, soon after these projections of growing corn imports were made, it became evident that China actually had a large surplus of corn. China had record crops in 2012 and 2013 while there were indications that domestic consumption of corn had slowed. The United States also had a record corn crop following 2 successive years of drought, causing U.S. corn prices to fall, while China raised its support price for corn. Thus, a large gap between Chinese and U.S. corn prices appeared in 2013.

Authorities in China purchased 70 mmt of domestic corn to maintain the support price during 2013/14. Officials announced that corn reserves grew to 100 mmt—approximately 50 percent of annual consumption. During 2014, authorities held auctions to release 63 mmt of corn from reserves into the domestic market, but only 25 mmt were actually purchased. Chinese authorities also announced that they would buy corn from the 2014 harvest to support prices, and market analysts anticipated that this would add even more to the corn inventory.<sup>2</sup>

It could take years for China to dispose of such large surpluses. With high Chinese prices, producers still had strong incentives to produce corn. The large corn surplus cast doubt on the consensus view that China would import large volumes of corn. This is not the first time a sudden change in market conditions altered assessments of China's supply and demand. A similar glut of grain appeared between 2000 and 2002, resulting in USDA's projected impact of China's WTO accession on U.S. agricultural exports being scaled back from \$1.6 billion annually (Colby et al., 2000) to \$900 million (Lohmar et al., 2002).

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<sup>1</sup> The report by Han and Jin (2014) is based on data from 2012.

<sup>2</sup> An official in one of China's leading corn-producing provinces said that most of the corn was stored in crude temporary bins where it was vulnerable to mold and pests (*Jingji Cankao Bao*, 2014). In October 2014, a Vice Premier raised concerns about the lack of storage for the new crop (China Government Net, 2014).

## China's Strategy for Controlling Agricultural Imports

Chinese officials are formulating plans and strategies to gain control over growing agricultural imports. These strategies imply extensive Government intervention that could lead to conflict and pose potential challenges for U.S. industry leaders and policymakers. Chinese leaders have made agricultural trade and investment a significant component of diplomacy, an initiative that mixes commercial and political objectives and further increases the role of Government officials in agricultural trade (*Xinhua News Service*, July 2014).

Chinese officials acknowledge the inevitability of international trade and its benefits and risks. The Development Research Center of China's State Council estimates that China's imported vegetable oils and oilseeds already utilize over 50 million hectares of land overseas, and they anticipate that China will need to import more feed grains in coming decades (Han, 2012). A Vice Minister of Agriculture noted that rising agricultural trade reflects the benefits of specialization based on comparative advantage but he also warned that pressure from imports can threaten China's control over its food supply (Niu, 2013).

During 2013, the Chinese leadership set forth a new food security strategy that was reiterated in the Communist Party's 2014 "Number One Document" on rural policy. The strategy acknowledges that imports are likely to increase due to changing diets, the growing role of livestock products, and limited endowments of land and water, but it asserts that China must take the initiative to ensure that domestic supplies will be China's primary food source (Han, 2013; Han, 2014; Han and Jin, 2014). The food security strategy calls for retaining Chinese control over the country's food supply by:

- Boosting domestic production capacity through investments in irrigation and other infrastructure, science and technology, and strong policy support, and
- Utilizing international markets and overseas resources in a way that ensures a dominant role for Chinese companies in the supply chain for imported commodities.

The food security strategy focuses on cereal grains, but its principles of self-reliance guide policy for other agricultural commodities as well.

While Chinese officials view agricultural imports as necessary and have endorsed a decisive role for the market, they appear to distrust international markets. Officials characterize agricultural markets as distorted by trade barriers, subsidies in other countries, and monopoly power exercised by multinational companies, and they raise concerns about risks introduced by climate change, biofuels, speculation in commodity markets, and export bans (Ni, 2011; Ni, 2012; Niu, 2013). In an article explaining the food security strategy, China's Minister of Agriculture asserted that the volume of global grain exports is insufficient to meet China's potentially large needs (Han, 2014). The food security strategy is strongly influenced by the perceived dominance of imports and foreign companies in China's soybean industry, which has been described as a potential threat to the country's soybean supply (Niu, 2013). Many of the measures advocated are designed to prevent such dominance from occurring in other sectors.

Officials call for limiting imports to a supplementary role in the food supply, similar to the view of imports articulated in the 1996 white paper "The Grain Issue in China." The Minister of Agriculture asserted that imports could fill market niches or gaps in domestic supply—such as importing high-

gluten wheat or barley for beer—or that imports can fill temporary deficits in supply or be used to replenish domestic inventories (Han, 2014). The “Number One Document” called for formulating plans for imports and exports and setting priorities for opening agricultural markets. Han and Jin (2014) suggested that China should follow the examples of Japan and South Korea in retaining at least 95 percent self-sufficiency in food grains, and they noted that China would face a “strategic choice” of importing feed grains or livestock products (p. 11).

Officials also raise seemingly contradictory concerns that the price of imports could be either unfairly low or unfairly high. A common theme in food security discussions is the pressure on domestic producers and processors exerted by low-priced imports. Officials advocate using border measures and trade remedies to stop imports or foreign firms from dominating any sector. Officials also advocate monitoring foreign companies operating in China and taking measures to prevent them from gaining the monopoly power that would enable them to raise prices.

An additional strategy of diversifying sources of agricultural imports is meant to give Chinese importers greater latitude to negotiate lower prices and to reduce risks from a potential embargo. Since the United States is the leading supplier of many imports, this strategy often entails opening China’s market to new countries to increase competition for U.S. products. For example, as China’s corn imports from the United States began increasing, Chinese authorities promptly opened its market to corn from Argentina and Ukraine during 2012.<sup>11</sup> During 2014, China approved sorghum imports from Argentina after China’s sorghum imports from the United States increased to over 4 mmt during 2013/14. In each instance, agreements on import protocols that typically take years to complete were finished within a few months.

Another objective of China’s food security strategy is to gain greater control over the supply chains for food imports via outbound investment by Chinese companies (Han and Jin, 2014). The “Number One Document” advocated increased support for an agricultural foreign investment strategy (USDA-FAS, 2014), and China’s Ministry of Agriculture (2014) recommended focusing investments on agricultural logistics, trading, and production assets overseas. *Farmers Daily* (August 2014) announced that Chinese President Xi Jinping advocated agricultural investment abroad as a way to preserve national food security and to support diplomacy. The strategy encourages Chinese companies to acquire assets in various stages of the supply chain for imported commodities to gain a larger share of profits for Chinese companies, establish reliable supplies for the Chinese market, and gain more influence over the determination of international prices.

Authorities are investigating support policies for outbound agricultural investment that include subsidized loans, credit guarantees, a foreign agricultural development fund, subsidies for overseas trips, providing information about investment opportunities, and training courses. According to *Farmers Daily* (August 2014), the outbound agricultural investment strategy is still in its initial stages. Most investments have been in Asia and Africa, but a number of prominent investments have been made in countries that are leading suppliers of China’s agricultural imports. Prominent investments in U.S. pork and dairy, New Zealand dairy farming and processing, a Netherlands-based trading company, and in Bulgarian grain and oilseed farming, processing, and logistics reflect the diversity of investments.

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<sup>11</sup> Chinese customs administration researchers reported that the United States supplied 97 percent of China’s corn imports after China began importing corn in 2010 (Customs Information Net, 2013).

China's leaders are also intertwining agricultural trade and investment with diplomacy. Trips to Latin America, Australia, and Eastern Europe by President Xi and Premier Li Keqiang during 2013-14 prominently featured agricultural trade and investment, a strategy described by official news media as "farm diplomacy," which increases the role of agriculture in China's foreign affairs (*Xinhua News Service*, July 2014). During 2013 and 2014, Premier Li's meetings with leaders from Central and Eastern Europe highlighted agriculture as a major area for Chinese investment, and he reached agreements to import cattle, pork, and mutton from Romania and Serbia. China has entered a number of free trade agreements with agricultural exporting countries, including New Zealand, Australia, the Association of Southeast Asian Nations (ASEAN), Chile, Peru, and Pakistan. The agreements included tariff reductions on beef, mutton, dairy, sorghum, and fruit. Agricultural officials in China also endorse engagement in the WTO and other multilateral organizations (Niu, 2011; *Farmers Daily*, January 2014).

## Transparent Policies for Efficient International Markets

International markets have been remarkably flexible and responsive to new demands from China. For example, China's soybean imports grew faster than anticipated by any projections, but producers in Latin America and the United States expanded soybean area and boosted yields to supply China's needs. The increase in U.S. production of fuel ethanol diverted corn from direct use as animal feed, yet its byproduct, DDGS, is now one of the leading U.S. agricultural exports to China. Similarly, the growth of U.S. sorghum exports to China was also largely unanticipated by forecasters and officials.

China's demand for imports may contribute to global agricultural output growth by inducing producers in exporting countries to increase efficiency and raise standards. Chinese outbound agricultural investments often target remote areas and less developed countries in Africa, Asia, and Latin America. Chinese investors may raise productivity in these areas if they can provide modern crop varieties, irrigation, and capital investment, and if they can link farms with processors and trading businesses. Neglected rural areas of North America, Europe, and Oceania could also benefit from Chinese agricultural investment.

However, opaque interventions in trade can create uncertainty that disrupts markets and prevents the investments needed to meet China's growing demand. Uncertainty about China's approval of genetically modified strains has delayed the commercial release of corn seeds in the United States (Polansek, 2014), yet exports to China account for less than 2 percent of U.S. corn output. Chinese authorities have also periodically rejected U.S. pork containing ractopamine, a feed additive approved for use in the United States (and most other countries) that channels the energy from feed into creation of muscle rather than fat. In 2013, the United States began a voluntary program to certify that pork was raised without the additive, but Chinese authorities reported detecting ractopamine in some U.S. shipments during 2014 (Guoji Xumu Wang, 2015). However, China's demand for U.S. pork varies from year to year, and without predictable demand from China, most U.S. producers are unlikely to alter production practices in order to conform to Chinese requirements. This is especially true for pork producers since Chinese buyers only purchase certain cuts of meat or internal organs that account for a minor share of the animal's commercial value.

China's domestic support policies have also distorted prices and sent confusing signals to markets. China's practice of annually raising support prices helped push Chinese prices above those in the global market. This created a distorted market in which Chinese authorities built large stockpiles of domestic commodities to support prices, while Chinese processors had strong incentives to import cheaper commodities (Gale, 2013). For example, China imported 17 mmt of corn, rice, and wheat during 2013—suggesting that the country had a deficit of grains—yet that year Chinese authorities also purchased over 82 mmt of domestic grain for reserves to support prices (table 5). China also imported rapeseed and cotton while stockpiling large volumes of those commodities from its domestic crop.

All countries have an interest in ensuring that China's emergence as an agricultural importer does not disrupt global markets. The primary beneficiaries are producers in the United States and other leading exporting countries, but the number of countries exporting to China is increasing as China's demand for imports grows. China views itself as an advocate for the interests of developing countries in multilateral organizations like the WTO (*Farmers Daily*, January 2014), but China's policies can distort international markets in ways that have negative impacts on developing countries that export or import food. Consistent application of regulations and standards, transparent approval processes,

and distribution of import quotas according to the demands of millers and processors will help international markets work more efficiently.

Table 5

**China imported commodities while stockpiling domestic crops during 2013**

Commodity	Imported	Domestic crop stockpiled
<i>Million metric tons</i>		
Grains	17	82
Rapeseed	3.7	4.5
Cotton	4.1	6.3

Source: USDA, Economic Research Service using China's customs statistics reported by the Global Trade Atlas (2014) and *Xinhua News Service*, January 2014.

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# Appendix 1

Appendix 1 table 1

## U.S. agricultural exports to China, by category, 2009-13

Product	Value of exports*				
	2009	2010	2011	2012	2013
	<i>\$ thousands</i>				
Agricultural products	13,109,278	17,563,710	18,891,226	25,855,186	25,880,644
Bulk products total	10,332,038	13,587,451	14,267,900	19,969,636	18,445,141
Wheat	86,893	40,536	160,194	213,541	1,320,317
Corn	48,055	278,123	842,770	1,309,720	1,241,473
Sorghum and other coarse grains	0	0	0	10	95,861
Rice	661	5,311	309	224	246
Soybeans	9,193,671	10,863,827	10,507,444	14,877,641	13,365,360
Other oilseeds	10,960	3,392	2,985	100	6,685
Cotton	861,818	2,213,328	2,623,395	3,430,404	2,198,467
Pulses	4,142	19,116	4,980	12,722	29,521
Tobacco	121,482	151,957	117,110	118,896	176,003
Other bulk products	4,356	11,861	8,713	6,378	11,208
Intermediate products total	1,307,499	2,659,154	2,514,299	3,236,809	4,382,792
Soybean meal	1,032	738	886	2,305	4,475
Soybean oil	34,507	395,006	128,717	264,741	134,828
Other vegetable oils	39,817	53,850	71,072	94,761	53,499
Animal fats	7,383	7,423	4,082	2,003	2,882
Live animals	31,563	32,127	44,477	60,011	63,326
Hides and skins	668,102	971,299	1,196,396	1,348,818	1,652,822
Hay	21,244	52,957	78,020	141,214	233,948
Distillers' dried grains	100,849	503,815	337,412	616,536	1,395,389
Other feeds and fodders	111,666	179,066	215,579	215,845	304,757
Planting seeds	48,778	93,077	95,875	97,820	102,451
Sugar, sweeteners, beverage bases	3,717	7,092	12,327	16,324	21,464
Other intermediate products	238,841	362,706	329,456	376,431	412,952
Consumer-oriented products total	1,469,740	1,317,105	2,109,026	2,648,740	3,052,711
Beef and beef products	801	1,267	51	1,148	143
Pork and pork products	81,002	228,336	712,869	704,015	703,540
Poultry meat and products (not eggs)	679,165	174,198	173,807	356,178	428,076
Other meat products	51,907	75,348	59,333	96,982	110,441
Eggs and products	3,315	2,963	4,362	1,699	2,702
Dairy products	137,467	237,188	361,993	415,342	706,159
Fresh fruit	55,376	80,041	103,133	111,483	119,478
Processed fruit	70,905	81,716	97,969	87,040	60,643

—continued

**U.S. agricultural exports to China, by category, 2009-13—continued**

Product	Value of exports*				
	2009	2010	2011	2012	2013
	<i>\$ thousands</i>				
Fresh vegetables	469	649	1,558	2,765	3,842
Processed vegetables	56,048	79,286	107,297	135,827	141,689
Fruit and vegetable juices	16,676	15,577	17,356	32,071	47,151
Tree nuts	143,116	144,736	202,680	391,754	358,680
Chocolate and cocoa products	23,284	27,624	43,488	48,589	49,344
Other snack foods	14,505	21,507	25,948	33,161	35,580
Breakfast cereals	1,358	3,120	4,657	14,026	10,296
Condiments and sauces	4,951	6,769	8,311	7,207	9,181
Prepared food	73,529	60,529	74,145	81,848	120,099
Wine and beer	25,011	34,984	65,358	75,938	86,518
Non-alcoholic beverages (not juice)	20,599	32,090	33,221	40,954	53,344
Dog and cat food	6,007	4,513	5,958	6,161	953
Other consumer-oriented products	4,251	4,664	5,532	4,554	4,851

\*Data are for calendar years.

Source: USDA, Economic Research Service analysis of data from USDA, Foreign Agricultural Service, Global Agricultural Trade System.

## Appendix 2

Appendix 2 table 1

### U.S. agricultural imports from China, by category, 2009-13

	Value of imports*				
	2009	2010	2011	2012	2013
	<i>\$ thousands</i>				
Agricultural products	2,875,627	3,369,019	3,993,666	4,534,705	4,422,459
Bulk products total	187,434	211,246	257,370	315,918	308,128
Wheat	35	12	23	69	342
Corn, other coarse grains	126	387	415	371	474
Rice	4,679	3,771	5,489	3,913	3,689
Other grains	1,056	1,205	3,840	2,622	1,308
Soybeans	45,915	12,878	13,956	64,622	77,300
Peanuts	4,100	4,926	10,809	13,895	7,266
Other oilseeds	7,747	12,209	15,126	6,214	8,096
Tobacco	8,236	3,890	2,470	5,321	2,416
Rubber & allied products	2,546	3,628	4,639	3,360	3,824
Coffee, unroasted	2,217	28,030	25,982	25,847	14,993
Tea	76,972	92,646	114,548	138,054	141,804
Sugar	4	22	56	41	24
Beans and legumes	23,419	37,570	47,574	33,369	24,100
Fibers	1,498	1,992	1,663	1,226	1,872
Intermediate Total	620,145	748,328	889,969	1,152,725	1,238,025
Tropical oils	8	87	125	64	107
Other vegetable oils	14,181	18,743	22,482	32,008	25,017
Feeds & fodders	27,546	44,865	57,528	124,552	150,210
Live animals	0	0	0	0	10
Hides & skins	617	385	242	470	386
Planting seeds	63,471	77,076	99,761	129,020	109,153
Sugars, sweeteners, beverage bases	12,813	8,671	14,981	12,094	11,890
Essential oils	31,983	47,732	51,593	53,855	63,415
Cocoa paste & cocoa butter	4,684	2,691	1,794	1,377	6,551
Animal guts and bladders	109,943	100,678	104,276	116,790	121,058
Feathers and down	66,463	120,249	128,322	154,942	159,242
Other animal products	89,567	96,676	120,313	156,274	165,498
Wheat gluten	3,355	2,145	1,404	5,193	10,540
Other intermediate products	195,514	228,332	287,148	366,086	414,948
Consumer-oriented products	2,068,047	2,409,445	2,846,328	3,066,062	2,876,306
Candy and confections	123,867	137,544	142,694	133,000	138,060

—continued

**U.S. agricultural imports from China, by category, 2009-13—continued**

	Value of imports*				
	2009	2010	2011	2012	2013
	<i>\$ thousands</i>				
Snacks and baked goods	42,567	52,764	60,487	60,352	58,155
Rabbit meat	2,533	3,430	2,602	2,767	3,031
Other dairy products	1,113	6,741	3,875	6,524	3,182
Fresh fruit	13,558	10,727	12,460	14,610	21,844
Fresh vegetables	75,105	132,012	120,380	168,558	214,328
Processed fruit & vegetables	746,140	812,915	950,512	998,130	974,189
Fruit & vegetable juices	356,957	385,519	558,822	634,776	542,162
Tree nuts	101,653	102,000	81,906	108,927	108,657
Wine and beer	6,404	7,083	7,343	8,285	7,778
Nursery products	19,259	21,569	26,798	27,609	29,548
Roasted & instant coffee	823	1,208	1,354	3,880	6,682
Spices	81,393	108,988	123,028	118,083	132,802
Frog legs	16,348	17,790	21,818	10,150	10,022
Pasta	49,634	63,153	79,086	83,930	92,315
Yeast	8,984	11,121	13,140	10,078	10,329
Soy sauce	14,206	16,130	19,192	22,155	22,791
Sauces and food preparations	83,161	97,564	113,288	116,797	126,098
Pet food	200,693	256,195	313,717	332,283	171,598
Enzymes	100,643	135,307	154,780	144,233	132,684
Other consumer-oriented items	22,995	29,685	39,032	60,921	70,051

\*Data are for calendar years.

Source: USDA, Economic Research Service analysis of data from USDA, Foreign Agricultural Service, Global Agricultural Trade System.