

Overview

China's consumers in the coming decade will rely primarily on their own farmers for grain supplies. At the same time, grain self-sufficiency is likely to decrease from 95 to 91 percent and government authorities will obtain more supplies from international grain markets.

China's economy is expected to develop rapidly in the coming decade. From 1996 to 2000, the annual average growth rate is projected at 8.8 percent. The growth rate is expected to slow from 2001-2005 to 7.5 percent per year. Per capita incomes are expected to rise accordingly, which will drive consumer demand for wheat and livestock products, such as meat, eggs, and milk.

While livestock output is expected to expand, the demand for these products will outpace domestic supplies, highlighting requirements to import meat or feed grains.

With rising incomes, consumers are expected to eat less rice, corn, sorghum, and millet as food grain, which will leave more grain available for livestock feed. But demand for feed grains is projected to exceed domestic supplies.

China has more arable land per capita than its East Asian neighbors, but most of its land is already in production. Additional land can be brought into production only at high cost. Economic growth in the coming decade will reduce China's bank of cultivated land and we project that for this and economic reasons, area sown to grains will decline in the coming decade.

China's grain yields are relatively high by developing-country standards but by developed world standards China's grain yields have considerable potential to increase. Higher yields can be obtained by using high-yielding seed varieties, applying better balanced chemical fertilizers, and making more efficient use of irrigation water and pesticides.

USDA forecasts that grain production in China will increase in the coming decade primarily because of rising yields, but demand for grains will outpace supplies (fig. 2).

China has a long history of storing grain. Stocks have been held for decades when China both exported and

imported grains. We forecast that grain stocks will be reduced marginally through time and we expect that grain imports will continue in spite of large stock holding.

Rising grain imports will stretch China's grain-handling facilities. China's seaport cargo throughput more than tripled from 217 million tons in 1980 to 744 million tons in 1994. But the expansion of China's foreign trade also strained China's domestic railroad, highway, and port cargo-handling facilities. China plans to boost grain-handling facilities in the coming decade and we assume that this capacity will keep pace with rising grain imports.

In past decades, leaders aimed at near grain self-sufficiency (allowing imports to account for 0 to 5 percent of total consumption). China has since softened its position and currently leaders anticipate imported grain to account for 5 to 12 percent of total consumption (fig. 3). USDA projects that by 2005 China will import 32 million tons of grain (fig. 4).

Wheat—Wheat imports are projected to rise from 12 million tons in 1996/97 to 18.2 million tons in 2005/06 (32).

Corn—USDA assumes that China will use various kinds of policy measures to constrain corn imports but will allow corn imports to rise from 2 million tons in 1996/97 to 11.8 million tons in 2005/06.

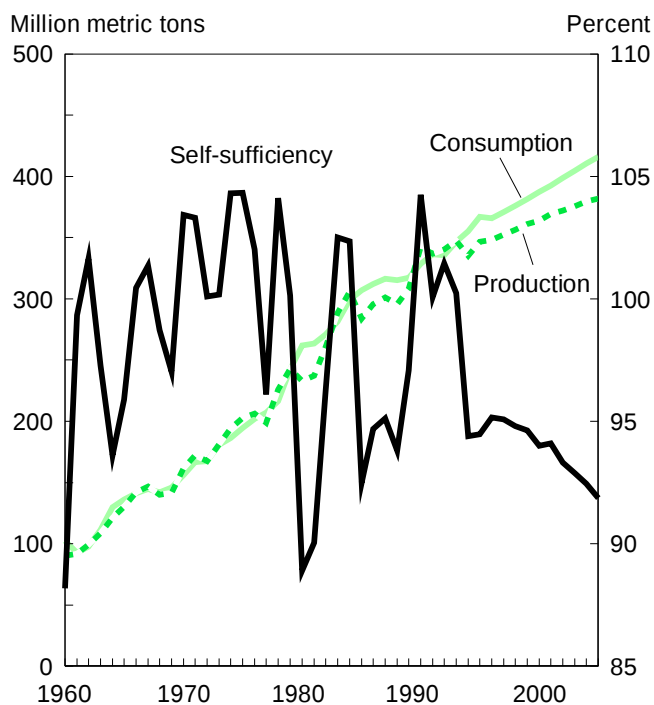
Rice—Rice imports are projected to rise slightly from 900,000 tons in 1996/97 to 1.1 million tons in 2005/06.

Meat—China is expected to become a net meat importer in 2000 and by 2005 net imports are projected to reach over 400,000 tons (fig. 5).

Figure 2

Grain production and consumption gap

China's grain production will increase in the coming decade.

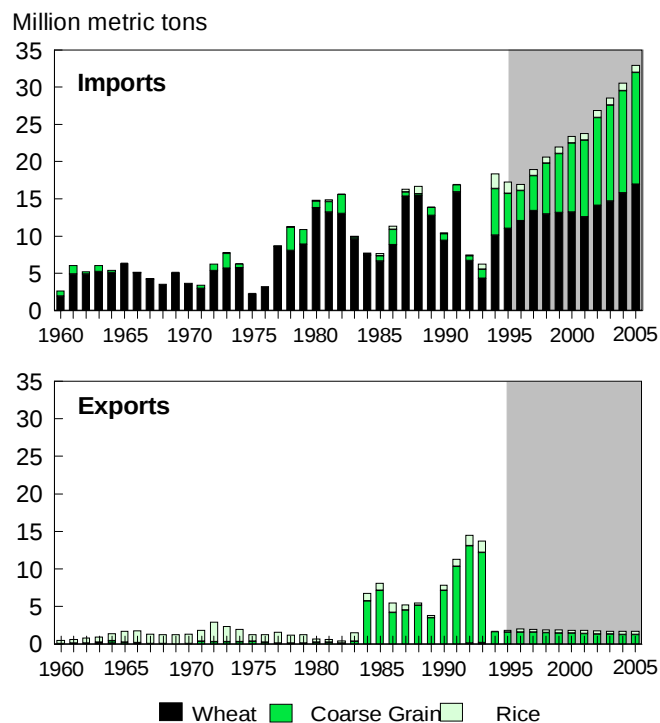


Sources: (44 and 45).

Figure 4

Grain import and export projections

By 2005, China will import 32 million tons of grain.

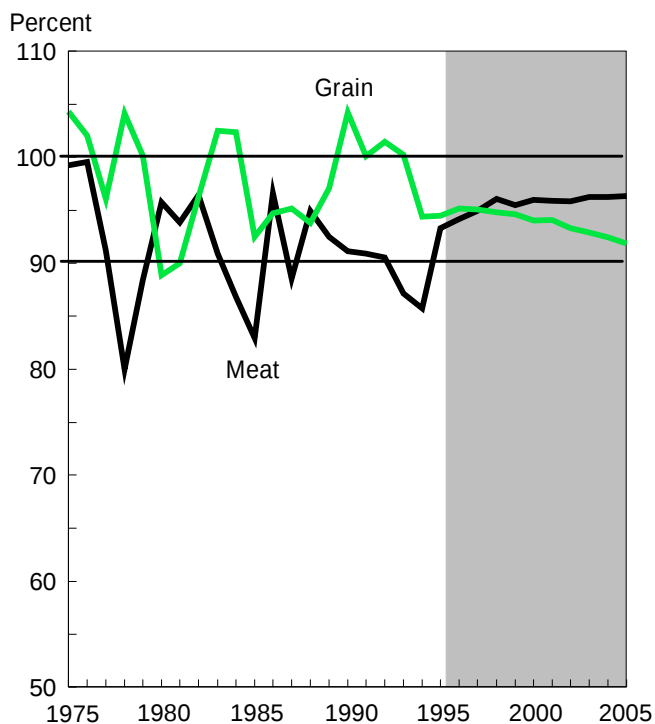


Sources: (44 and 45).

Figure 3

Self-sufficiency in grains and meat

China's self-sufficiency in grains and meat will remain high.

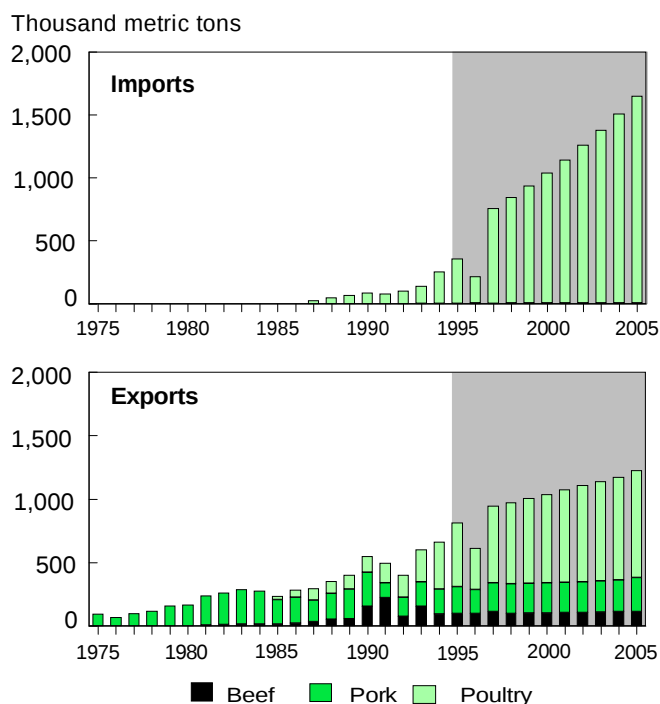


Sources: (44 and 45).

Figure 5

China's meat import projections

By 2005, net meat imports are projected to reach over 400,000 tons.



Sources: (44 and 45).

Implications for the United States

Rising grain demand in China will affect: a) China's domestic grain economy and its rural environment; b) the grain economies of grain exporting countries including the United States; and c) grain supplies in international markets for grain importing countries.

As a major grain producer and exporter, the United States has a vital interest in the projected increases for China's grain imports. Larger China grain imports likely will mean larger U.S. grain exports either to China directly or to other markets as China withdraws from markets and other suppliers begin to ship more grain to China.

The United States actively participated in China's grain trade since the early 1970's. The volume of U.S. grain exports to China, however, has been volatile, accounting for 0 percent of China's total grain imports in 1975 to a peak of over 9 million tons and 63 percent in the early 1980's (fig. 6).

In the early 1990's, China's rising corn exports made it the world's second-largest corn exporter after the United States. China's exports were partially responsible for a sharp decline in the U.S. share of the South Korean grain market in 1991-93.

But things changed dramatically in the last 2 years. Stocks-to-use ratios for grains are lower than they were in the early 1970's, with global grain consumption in 1995/96 projected to exceed output for the third year in a row. These developments occurred while China's grain prices were rising, leading its government to curb exports and expand imports starting in late 1994.

Since 1993, China has shifted from net exports of 7.5 million tons of grain to net imports of 15.5 million tons—a swing of 23 million tons, or about 10 percent of global grain trade (fig. 7). In 1985, the USSR imported more than 50 million tons of grain and world grain prices continued to fall. Previous swings in China's grain imports have been significant but only about half as large as the 1993-96 swing. In 1995, China accounted for 21 percent of world grain production (USDA definition).

China's temporary entry into the coarse grain market and subsequent withdrawal aided U.S. grain sales to

Asia. About 80 percent of the 24-million-ton gain in U.S. coarse grain exports in 1995 went to Asia. Besides China, big gainers were Japan, South Korea, and Malaysia (fig. 8). Some of the gains were due to expanding markets, but most were due to a rising U.S. share as China withdrew from neighboring markets. U.S. coarse grain exports to China rose from 36,000 tons in 1994 to 5.4 million tons in 1995. Exports to Japan in 1995 rose 32 percent (from 13.8 million tons in 1994 to 18.3 in 1995). Shipments to South Korea more than tripled from 2.4 million to almost 9 million tons in 1995 as China exported less and South Korea's compounders used more U.S. corn and less feed wheat.

U.S. sales of all farm products to China increased, from less than \$400 million in 1993 to over \$2.5 billion in 1995, reflecting the sharp ups and downs typical of U.S. agricultural trade with China over the past 15 years. Wheat and cotton are the main commodities in this trade. U.S. coarse grain exports to China were relatively minor until last year (fig. 9).

Increased domestic grain and animal production in China in the coming decades will have economic and environmental impacts on China's land, labor, and water resources. China's imports of grains and meats likely will spur production in supplying countries, including the United States, and this increased production will likewise have economic and environmental impacts.

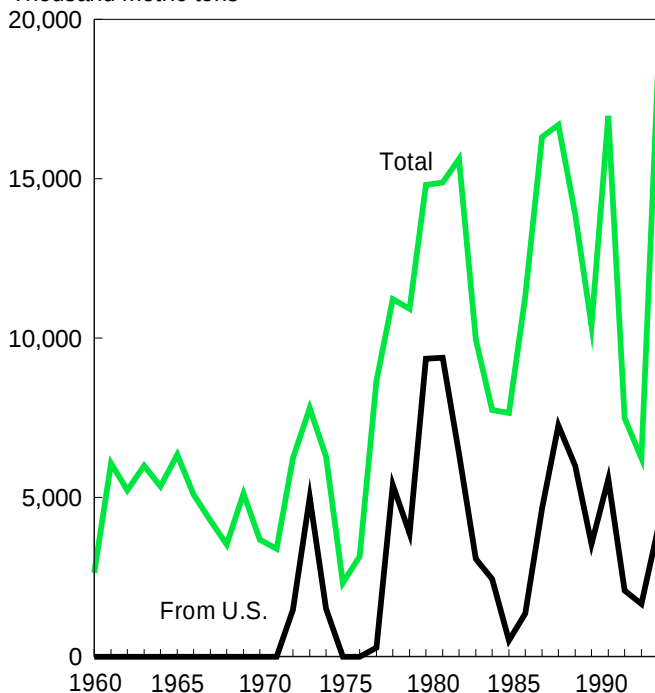
USDA's definition of grain includes wheat, rice (on a milled basis), corn, sorghum, millet, barley, and oats. China's State Statistical Bureau (SSB) defines "grain crops" to include not only the USDA grains (with rice on a paddy basis), but also potatoes converted to their grain weight equivalent, soybeans, pulses, and other grains such as buckwheat. In 1995, China produced 465 million tons of grain crops according to the SSB definition but only 355 million tons according to USDA's definition.

Figure 6

China's grain imports and U.S. share

The volume of U.S. grain exports to China has been volatile.

Thousand metric tons

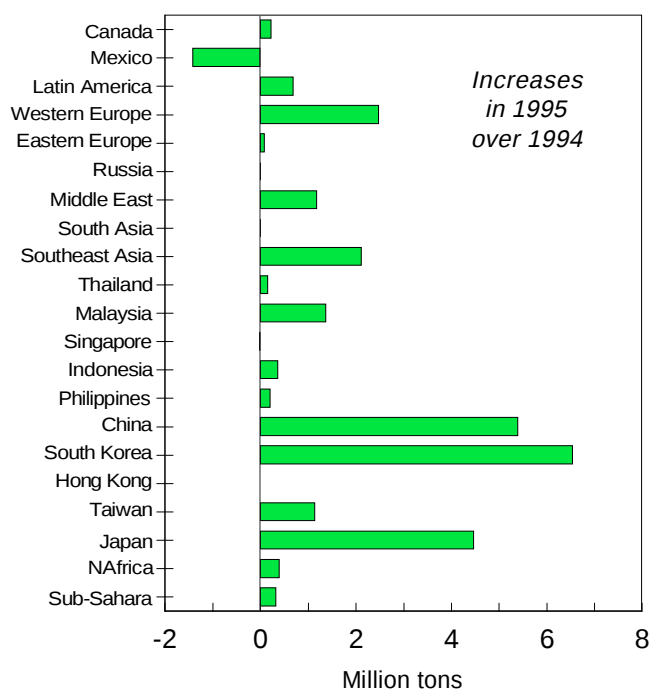


Sources: (45 and 46).

Figure 8

Big gains in U.S. feed grain sales

Besides China, big gainers included Japan, South Korea, and Malaysia.



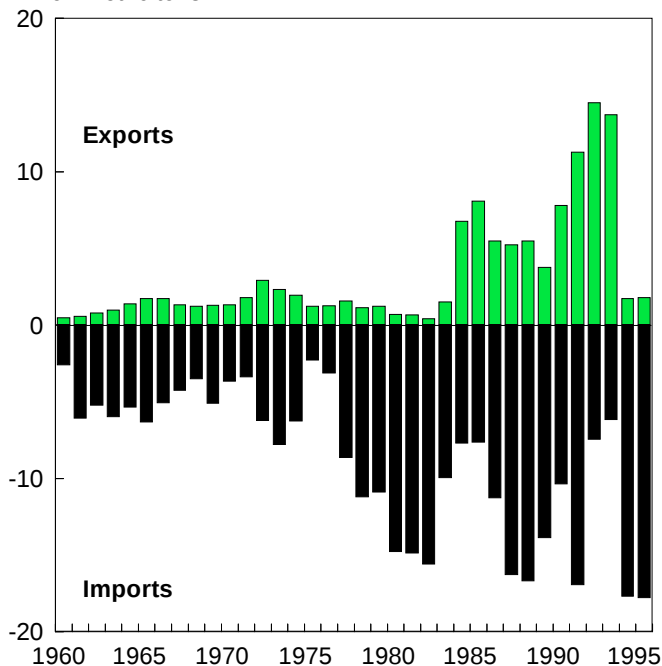
Source: (11).

Figure 7

Switch from net grain exporter to importer

Since 1993, China shifted from net exports of 7.5 million tons of grain to net imports of 15.5 million tons.

Million metric tons



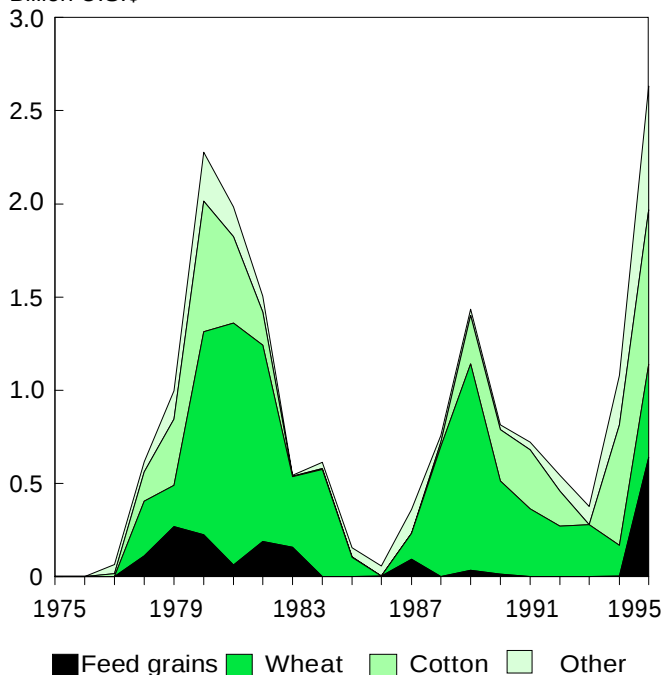
Sources: (45 and 46).

Figure 9

U.S. agriculture exports to China

U.S. exports to China are primarily wheat and cotton. Exports of feed grains set a record in 1995.

Billion U.S.\$



Sources: (45 and 48).

Meat Consumption and Production Will Rise

China's farmers will increase production of feed grains and meat but the gap between demand and supply will widen. Feed grain and meat imports will increase to fill the gap, but government authorities will use trade restrictions to limit these imports.

Real per capita incomes rose rapidly since reforms began in the early 1980's. Real rural per capita incomes rose from 191 Renminbi (RMB) in 1980 to 465 RMB in 1995. Renminbi is China's currency and in 1995 the RMB to U.S. dollar exchange rate was 8.3 RMB to the dollar. Urban real per capita incomes rose from 439 RMB in 1980 to 984 RMB in 1995 (fig. 10). Growth in urban per capita incomes is more important for understanding the dynamics of feed grain and meat imports because most imported feed grains and meat are delivered to meet the demands of urban residents. China's urban population is expected to rise from 350 million in 1995 (29 percent of total population) to 500 million people in 2005 (35 percent).

Pork will remain the dominant meat, but government grain-saving policies will favor chickens, which are better grain-to-meat converters than hogs. Government authorities are currently focusing administrative energy and investments to expand poultry production as a grain-saving strategy. Also, we assume that authorities will support ruminant animal (beef and sheep) production because these animals can produce meat from forage grasses and hence conserve grain. As demand pressures for feed grains weigh ever more heavily on available supplies, we assume that government authorities will increase their emphasis on poultry and ruminant meat production (fig. 11).

Meat production is projected to increase 60 percent between 1995 and 2005, with production of beef, pork, and chicken increasing 92, 45, and 113 percent, respectively. Self-sufficiency will largely be maintained for meats, except in the case of poultry meat (mainly parts such as wings), imports of which will rise to more than 1.5 million tons by 2005 (fig. 12). Poultry meat exports are projected to rise to 800,000 tons by 2005.

The increase in demand for feed grain is driven by China's rapidly growing livestock sector, which in turn

is responding to China's growing appetite for meat. Meat consumption in China has risen rapidly from 13.4 kilograms (kg) per person in 1980 to 41.2 in 1995. In 1995, China's per capita consumption of red meat (beef, mutton, and pork) was about the same as Japan's and slightly higher than South Korea's, but much lower than Taiwan's (fig. 13). ERS projects China's meat consumption to rise from 37 kg per capita in 1996 to 61 kg in 2005, a 65-percent increase (fig. 11).

The meat consumption projections assume real GNP growth of about 8 percent per year in the next 10 years. The projections also assume that despite robust economic growth in the coming decade, disposable income available to urban residents for the purchase of food will not keep pace with income growth. Lower urban subsidies for rent, education, and food will constrain the growth in income for expenditures on meats.

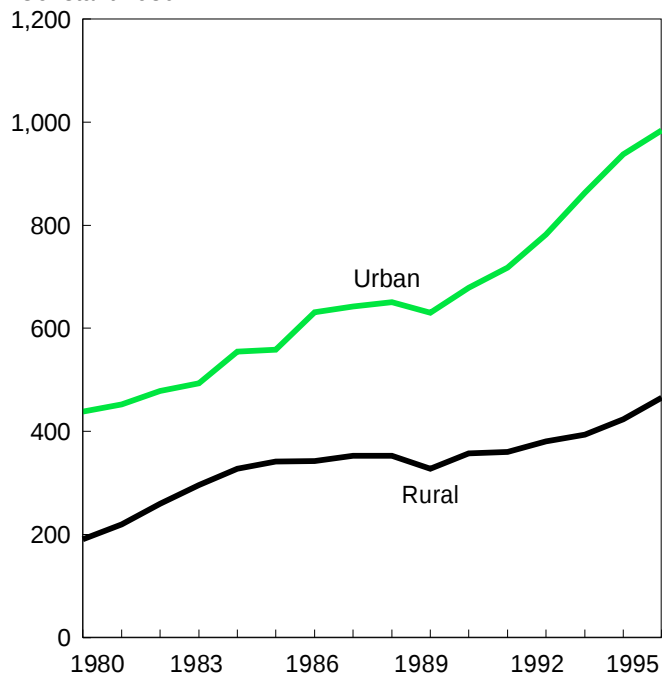
China's leaders likely will constrain meat imports to levels that do not exceed 5 percent of domestic production and grain imports to levels that do not exceed 10 percent of production. Since 1949, China's leaders have managed imports with a bias toward importing capital goods and technology. They are likely to treat feed and meat imports in the future as luxury items (6). They are likely to use foreign trade control instruments like those used in Taiwan, South Korea, and Japan to restrict meat as well as feed grain imports. For example, in April 1996, China announced a new tariff rate quota system and tariff rates. The tariff rates on in-quota corn are low at 1 percent, but the tariff rate jumps to 114 percent for over-quota imports. These tariff rates suggest that China's authorities intend to use the quota system and tariff rates to constrain feed grain imports. The tariff rates on beef are 50 percent, pork 45 percent, mutton 45 percent, and poultry meat 45 percent.

Figure 10

Real rural and urban per capita incomes

Urban real per capita incomes increased from 439 RMB in 1980 to 984 RMB in 1995.

Constant 1980 RMB



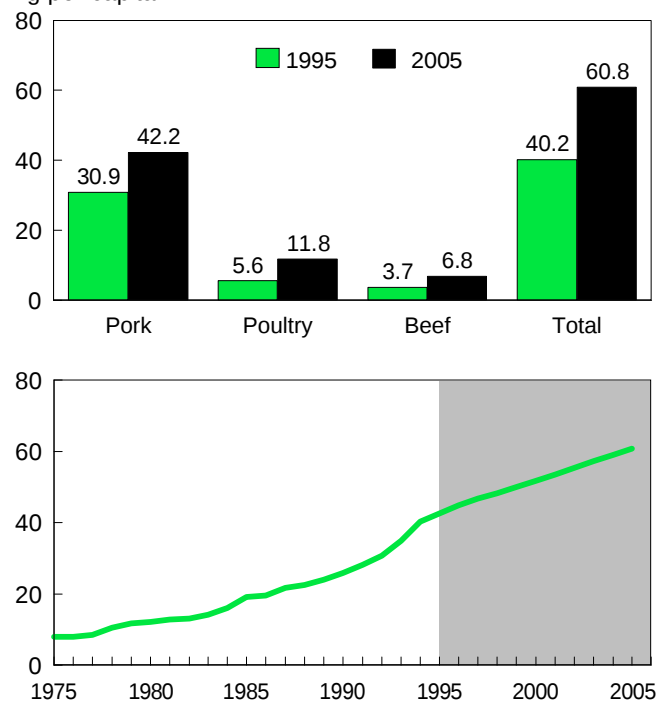
Source: (40).

Figure 11

China's per capita meat consumption

Per capita consumption for all meats is rising.

Kg per capita



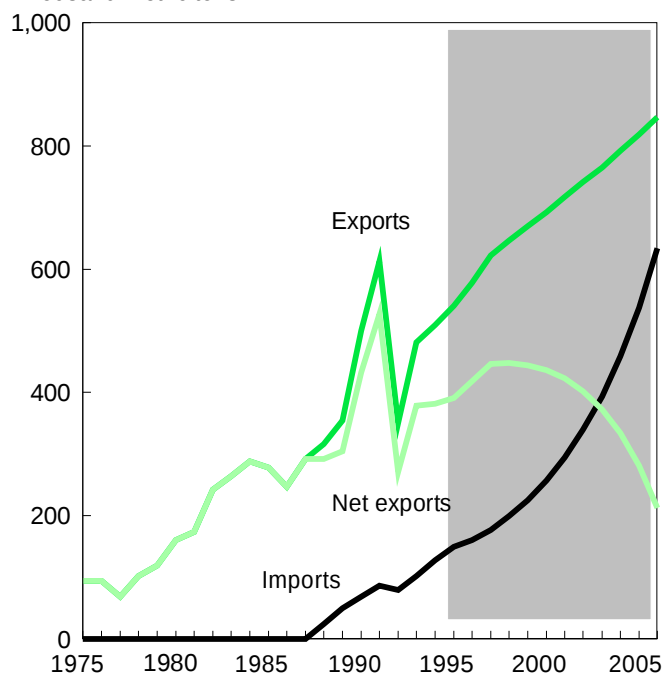
Sources: (45 and 46).

Figure 12

China's total meat trade projections

Meat production will continue to increase.

Thousand metric tons



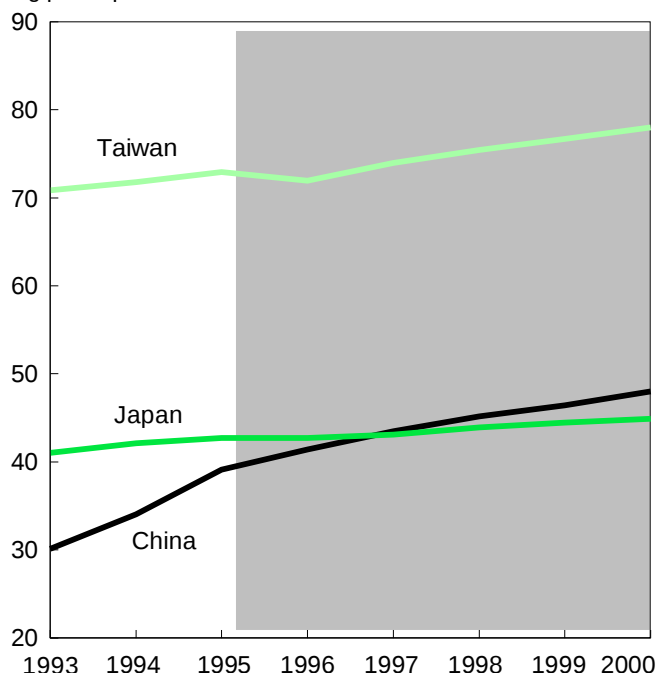
Sources: (44, 45, and 48).

Figure 13

Asia per capita meat consumption

China's per capita consumption of red meat was about the same as Japan's but much lower than Taiwan's.

Kg per capita



Source: (45).

Grain for Food Use Stable, Feed Use Rising

While total grain consumption will increase, per capita food grain consumption will decrease in the coming decade as consumers reduce direct consumption of grain and switch to meat, vegetables, fruits, and processed foods. Feed grain use, on the other hand, will expand.

Grain for food use is projected to increase by 0.7 percent per year between 1995 and 2005, well below the projected population increase, which means that per capita consumption of grains will decrease. Current sample survey results confirm that as incomes have risen, consumers have chosen to eat less grain and eat more fruits, vegetables, processed foods, and meat products (fig. 14). Urban per capita grain consumption, especially coarse grains and potatoes, has fallen since the mid-1980's.

Grain for feed use is projected to rise from 120 million tons in 1995 to 152 million in 2005. In the last decade, citizens shifted grain consumption preferences from potatoes, corn, sorghum, barley, and oats to wheat and rice. Low-quality rice in south China was fed to livestock. In the coming decade, farmers are projected to increase plantings of higher quality rice. Potatoes and

coarse grains for food use will continue to decrease and these grains will be fed to livestock (fig. 15).

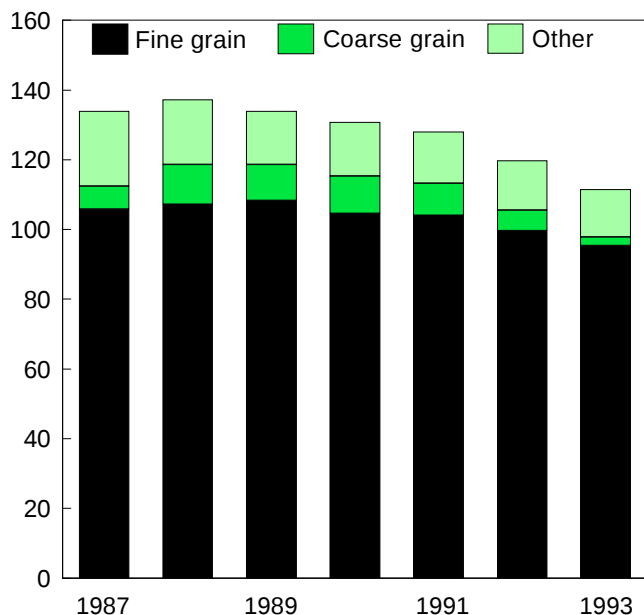
As grain supplies become tighter in the coming decade, government authorities likely will increase efforts already begun to conserve grain. Each year millions of tons of grain are lost during and after harvest. A large World Bank project has allocated funds to help China find ways to cut storage losses and improve the capacity to ship grains from surplus to deficit areas. Efforts are also underway to improve the efficiency of grain use in manufacturing alcohol, feed, milled grain products, and grain used in food processing. Government authorities already are concerned that about 30 million tons of grain each year are used to manufacture alcoholic beverages. Constraining output of alcoholic beverages would boost grain supplies for direct human consumption. Government research and policy need to be directed toward minimizing post-harvest losses so that more grain actually ends up in family rice bowls.

Figure 14

Urban per capita direct grain consumption

Urban per capita grain consumption has fallen since the mid-1980's.

Kg per capita



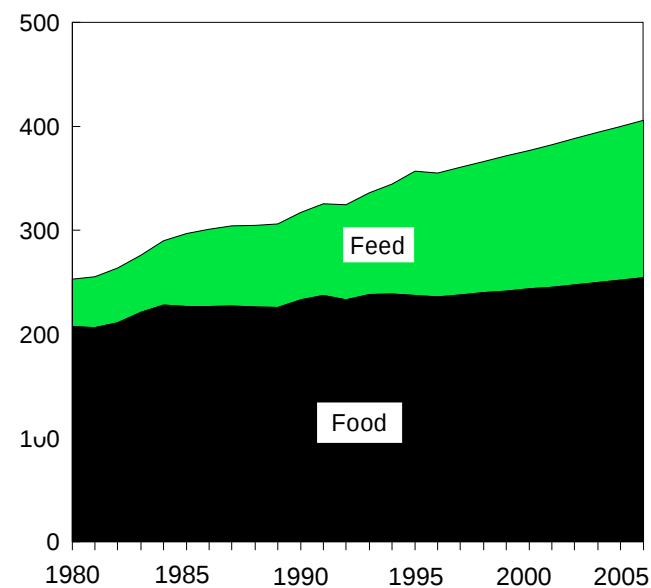
Source: (40).

Figure 15

Food and feed grain use

Food grain use stable, feed use rising.

Million metric tons



Sources: (44, 45, and 48).

Reports Suggest Large Grain Stocks in China

Over the past 2,000 years, governments in China have typically held large grain stocks. Large grain stocks are currently held by both government units, commercial companies, and mills, and by farmers. Government-controlled stock data are considered secret and it is very difficult to obtain information on the grain reserves. As economic reforms continue, these stocks likely will decline.

Current On-Farm Stocks Very Large

The irony of rising grain prices and grain imports in China is that current on-farm stocks in China are very large. ERS analysts estimate (using rural household surveys) on-farm stocks to have risen from 344 million tons in 1991 to 458 million in 1994 (fig. 16). About 40 percent of this grain, or about 183 million tons in 1994, was estimated to have been carried over; that is stocks in storage bins when new production was harvested and delivered to granaries. For 1991, ERS estimated that on-farm grain stocks were composed of 77 million tons of wheat, 130 million tons of paddy rice, and 137 million tons of other grains: corn, sorghum, barley, potatoes, and other grains (14).

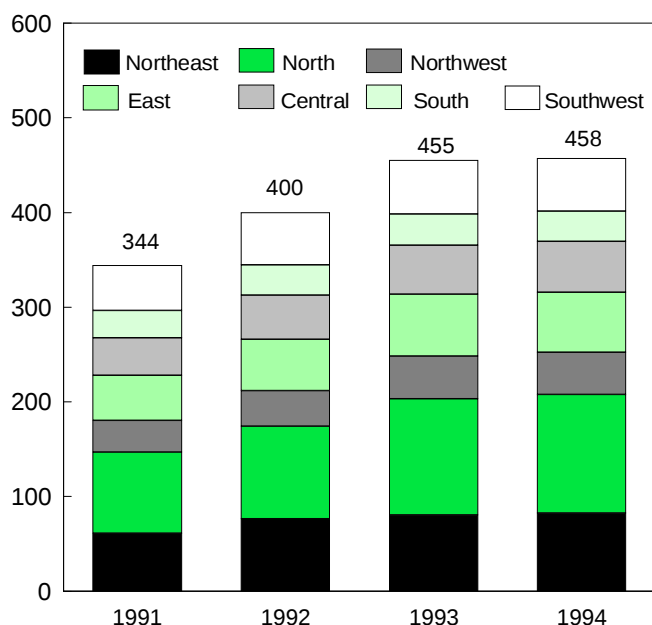
Farmers store substantial quantities of grain as insurance against drought and other disasters. Stock levels

Figure 16

On-farm grain stocks

On-farm stocks have risen by 33 percent from 1991 to 1994.

Million metric tons



Sources: (15 and 41). Not official USDA data.

are highest in the north where the growing season is short and the probability of drought and early and late season frost is high (10).

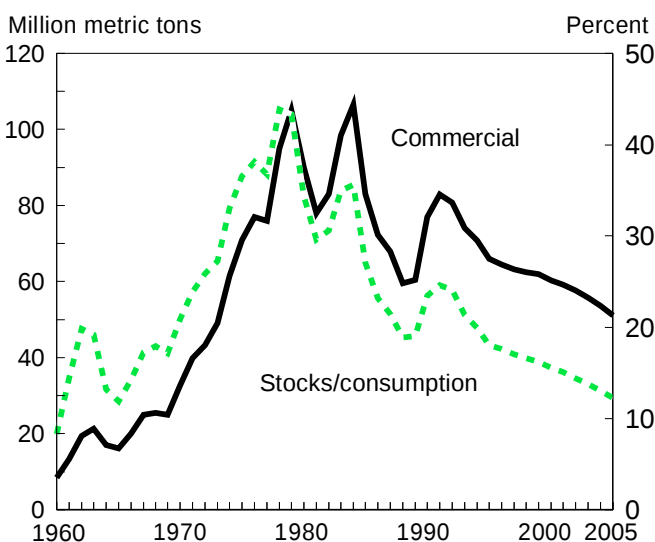
Public and Commercial Grain Stocks To Fall

Contemporary grain storage programs in China rest on more than 2,000 years of tradition. In periods of stability, it is China's historical norm to hold grain stocks. Since 1961, the government vigorously pursued a grain storage program. Off-farm stocks rose to a peak of 106 million tons in 1983 and then, as market reforms were instituted, off-farm stocks dropped to an estimated 72 million tons in 1995. Stocks-to-use ratios are expressed in percent on the right margin (fig. 17). Off-farm stocks include some commercial working stocks and strategic reserves held by the central government. The Food and Agriculture Organization of the United Nations has suggested that the average loss rate of stored grain in the world averages 8 to 10 percent, but in China the rate is from 12 to 18 percent.

Figure 17

Government stocks

China's grain stocks forecast to decrease in next decade.



Sources: (45). USDA data and estimates.