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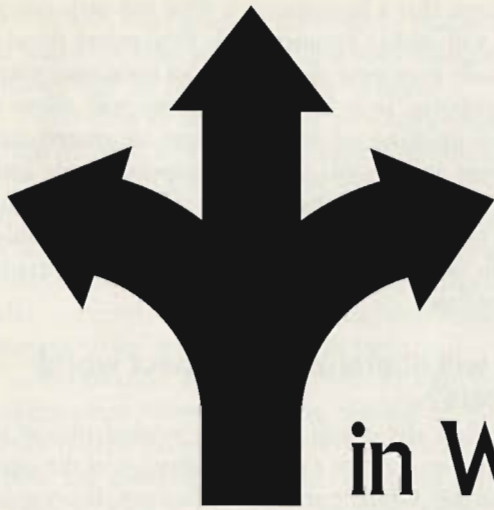
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# China's Role in World Livestock and Feed-Grain Markets

by Dermot  
Hayes

**W**hen we look back at trends that shaped U.S. agriculture in the 1990s, economic and dietary changes taking place in China may be among the most important. In the past two decades, China has been transformed from a country that did not meet all of the food needs of its people to one that should be able to provide meat, poultry, dairy products, and even alcohol to a majority of consumers within twenty years. It will have achieved this by allowing markets to work and, hopefully, by utilizing China's comparative advantage. To meet this potential, China will need to change many of the food and trade policies currently in place. If this occurs, the United States will experience a large and sustained growth in agricultural exports and U.S. farmers should temporarily benefit from strong prices. What type of policy changes might take place if China pursues a more open trade policy, and what might these changes mean to U.S. farmers?

## Policy changes

In speaking with senior Chinese policy makers, they all want to maintain China's self-sufficiency in food, but they have a very unsure grasp of market economics and the forces of comparative advantage. For example, they seem to believe that food consumption and food expenditure patterns can be controlled by the government. They also appear to believe that any Chinese food imports would cause world food prices to rise to such an extent that Chinese food prices would be higher under free trade than under self-sufficiency. The general consensus among these senior leaders is that China can continue to experience rapid per capita income

growth while meeting all or most of the food needs of its people. This is to be achieved by developing new land, increasing yields, and discouraging people from consuming grain-intensive products such as pork and alcohol (Baorui). This line of argument is so ingrained and the self-sufficiency outcome so strongly desired that it is easy for the Chinese to believe that it will happen simply because so many people wish it could be so.

Figure 1 shows a fundamental problem with the logic behind the self-sufficiency argument. China has about 7 percent of the world's arable land and about 21 percent of its people. It must feed five people for every acre of arable land, an achievement that is possible only if the diet is restricted primarily to grains. Meat, eggs, dairy products, and alcohol are all very inefficient ways to consume grain. Countries can achieve a diet that is intensive in livestock products and alcohol if they have a land share that meets or exceeds the population share, as do the United States and Europe, or by importing foodstuffs, as do Japan and South Korea. Chinese officials argue that yields can be increased and that more land can be brought under the plow. But yields and land utilization are already quite high, and some of the proposed new lands have not yet been tilled for good reasons.

Other features that stand out on visits to China are the ethic, intelligence, work entrepreneurial skills, and language abilities of the younger generation. Also evident is the lack of any real government control over market forces. The Beijing government may, for example, dictate a maximum retail price for pork, but this has little meaning in

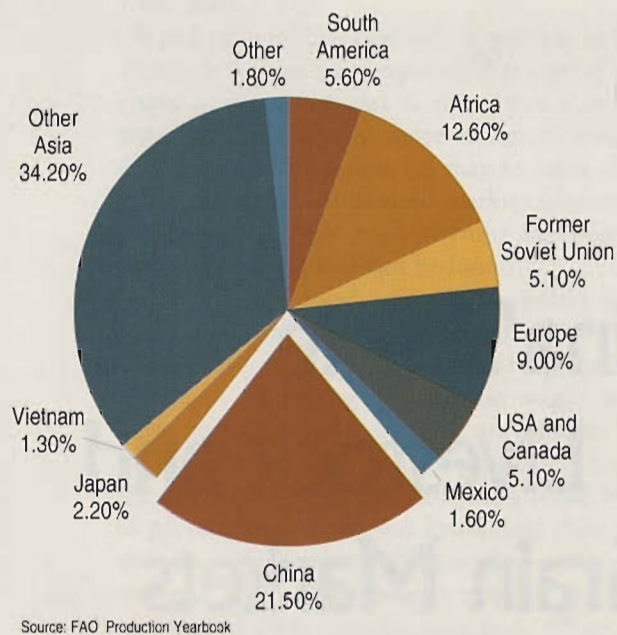


Figure 1a. Share of world population

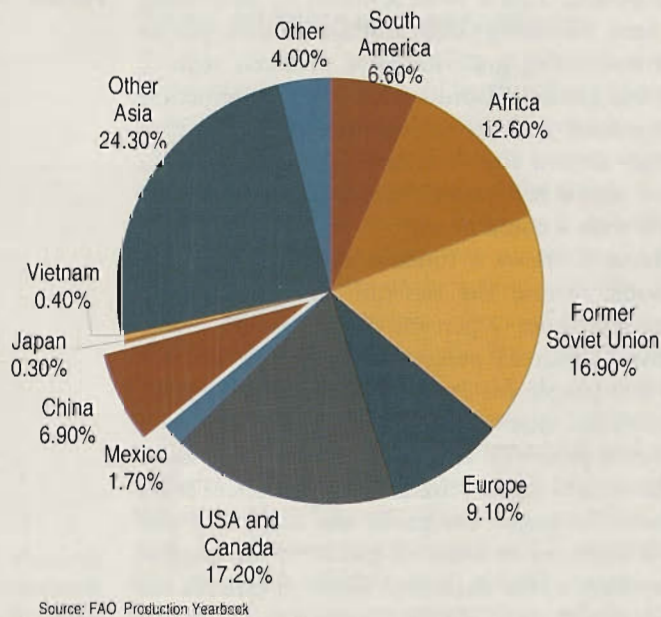


Figure 1b. Share of world arable land

distant provinces where most hogs are slaughtered for private markets.

Most economic forecasters project that Chinese per capita incomes will continue to increase at 6 to 8 percent for the foreseeable future (FAPRI). In order to meet these projections, China must continue to free the economy and find export markets for the labor-intensive goods and textiles that it will have in such surplus. To do this, it needs access to world markets, and this can best be achieved if China becomes a member of the World Trade Organization. Pressure from this body and a gradual

realization that a Japanese-style food self-sufficiency policy will lead to Japanese-style food prices should eventually overcome the insecurities associated with food imports. It is likely that China will allow a gradual opening of food markets in return for multiyear access to U.S. and European textile and industrial markets. The opening will be phased in over a five- to fifteen-year period and will probably exclude rice and some other politically important commodities.

### How will liberalization impact world markets?

With all of the details yet to be worked out, it is premature to attempt a precise evaluation of the outcome of any Chinese trade liberalization. Economic models can be used, but these offer, at best, a more formal structure within which the data can be analyzed and the projections made. Those models that have been used to make Chinese import projections (in the absence of a trade agreement) have a disturbing tendency to agree that in ten years China will need to import about 30 million tons of grain. None has projected any meat imports. The fact that the models tend to agree on what is really the difference between two enormous numbers (Chinese grain consumption and Chinese grain production) shows how subjective these formal processes can be. Economic logic and economic theory, however, do suggest what might happen, in a very general way, if China frees up food and agricultural markets. What follows is a description of some of the most important and relevant economic concepts, as well as a brief explanation of how these concepts can be used to better understand how Chinese trade patterns will evolve.

*The factor price equalization theorem.* This concept is well known among economists but it raises eyebrows outside of academia. The theorem states that under free trade in goods, technology, and capital, wage rates (adjusted for education) will be about equal in every country. This will occur even if labor is not allowed to emigrate. Wage rates depend on labor productivity, and as long as capital and technology can move, wages in poor countries will rise as industries adopt new technologies that increase labor productivity.

*The theory of comparative advantage.* This model states that countries will export those products that use intensively those factors with which the country is relatively well endowed and will import the commodities that use intensively the factors that are relatively scarce. For example, countries with an abundance of copper will export products that require a large amount of copper. As we have seen, China is well endowed with people and poorly endowed with land. The United States and Canada are uniquely well endowed with land and have relatively

few people. Feed grains and feed-grain products such as meats are land intensive, and with modern technology they do not require a lot of labor.

According to this theorem, as China reduces its trade barriers, it will tend to expand production of labor-intensive crops such as fruit and vegetables and reduce feed-grain production. This is exactly what happened in South Korea and Japan after these countries partially opened their markets. The plan adopted by the current Chinese leadership, however, flies in the face of this logic.

*International dietary convergence.* This research suggests that when people are exposed to the same set of relative prices and experience the same income levels, the composition of their diets will eventually converge. That is, the vast differences in dietary patterns we see around the world are driven by different relative prices. If markets are liberalized so that new foods become available at affordable prices, then diets will eventually change. Again, this is a very gradual process; it will take many years before relative prices in China match those in the United States. It will take many years after that before menus and tastes fully adjust. The trend, however, is clear. China will eventually see an increase in per capita meat consumption from an estimated 17 kg per capita today to the 80 kg that is common in Europe or the 100 kg that we consume in the United States. See Fuller, Hayes, and Smith for a discussion of Chinese per capita meat consumption.

### Meat or grain imports?

If China does become an importer, will it import meat or feed grains? First, we know that livestock production is capital intensive (just ask any farmer with a pen full of market-ready cattle), so it makes more sense to add value to livestock in countries like the United States that are capital rich. China is capital scarce and, because the political and economic climate is volatile, real interest rates in China will have to be high to attract capital from abroad. All else equal, this suggests that China would import the capital-intensive product (meat) as long as it is practical to do so using available transportation technology. It is now possible to transport boneless boxed meat from the interior of the United States to Asian markets for as little as \$0.14 per pound. It takes only \$0.06 to transport a pound of grain to an Asian farmer, but a pound of boneless boxed pork or beef contains 8 to 16 pounds of grain. Thus, the transportation argument also favors meat imports.

### Speculating on the future

Higher income levels projected for China will create a demand for a diet similar to that in wealthy countries. Not only will total feed-grain require-

ments rise as meat consumption increases but this will happen at a time of falling Chinese feed-grain production. At first, the Chinese government will oppose grain imports; then China will become a reliable importer of grain. This period could last from five to fifteen years. Second, Chinese grain prices will rise to world prices plus transportation costs. This in turn will mean that Chinese feed rations will be about twice as expensive as those in the United States. Third, Chinese animal feeders will be unable to overcome this feed cost disadvantage because capital costs in China will also be greater than those in the United States. Fourth, imported meat will arrive in Chinese ports at a price that is lower than the cost at which Chinese meat can be produced. These economic forces, coupled with a Chinese preference for those parts of the carcass least in demand in the West, make it likely that imported meat will eventually dominate the market. Much of this meat will come from the United States because it has the land and capital resources for efficient feed-grain and livestock production.

All of these speculations may seem to be particularly optimistic for U.S. agriculture. In fact, many Chinese officials have become very concerned about similar predictions made by Lester Brown, a well-known author on world food security who has predicted that China will cause worldwide food scarcity. However, there is more to the story. Economists also believe in the ability of markets throughout the world to respond to additional needs. Higher prices will draw forth additional supplies, along with the technologies that are needed to ensure that yields and production rise to meet the challenge. The long-run supply curve is not flat, but, as experience in the European Economic Community in the 1970s has shown, farmers can greatly expand production when the price is right.

The projected delays in implementation of reforms will also work to stabilize markets because the



U.S. Meat Export Foundation



U.S. Meat Export Federation

annual increases in Chinese imports will be kept to a minimum by Chinese policy makers. These trends will occur over a period of twenty or thirty years, and this will allow the farmers in food-exporting countries to increase production to meet the challenge. Prices will rise when the demand increase is unanticipated, but otherwise prices should reflect actual production costs. Production costs will rise in part because land prices will rise to absorb any benefits. Chinese consumers will have access to inexpensive food and a varied diet. China will be able to increase incomes in rural areas by allowing farmers to grow more profitable crops, such as fruit and vegetables. China will also be able to solve some of its infrastructure problems by importing grain (or meat) directly into the booming coastal provinces. Chinese incomes will increase because Chinese resources will be put to their best use.

The implications of these outcomes are that (a) market development efforts in China will eventually pay off, although this return may be many years in coming; (b) U.S. feed-grain farmers will soon lose a competitor (China) and gain a customer (China); (c) U.S. feed-grain exports will increase and these exports will eventually be replaced by meat exports; (d) profits to feed-grain and meat producers will be good in the years when exports expand most, but these profits will not continue

indefinitely; and (e) these trends will cause U.S. land prices to grow at a faster rate than would otherwise have been the case. ■

### ■ For more information

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