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The Long-Term Boom in China's Feed Manufacturing Industry

China's rapidly expanding feed manufacturing sector is now second only to the U.S. industry. After growing at an average annual rate of 15 percent since 1990, output of manufactured feed reached 66 million tons in 1998. Feed mills are becoming bigger and more efficient as new, higher capacity mills replace old, small, inefficient ones. New mills often use technology and management skills acquired from foreigners in joint ventures and adapted to local needs.

China's feed manufacturing industry has developed as the needs of its animal producers have evolved. Livestock production, still largely a sideline, with household members feeding mainly farm byproducts to a few animals, is gradually shifting to a full-time occupation, using purchased feedstuffs for a relatively large number of animals. Producer adoption of manufactured feeds allows transition to a larger scale of operation, and also facilitates production of higher-quality meat desired by consumers with rising incomes.

China has emphasized self-sufficiency in grain production. It may continue to resist importing complete feeds, although it is likely to expand imports of nongrain feed ingredients, such as protein meals and

feed additives. From 1992 to 1998, soy meal, fishmeal, feed-grade lysine, and methionine were among the largest import items for the feed industry.

Feed Industry Development Reflects Policy Shifts

China did not have a modern, mechanized feed industry when the Communist Party took control of the mainland in 1949. Shortly after feed manufacturing did begin, its development was arrested by a series of disastrous economic policies.

In the mid-1950's, after consolidating their power, the country's Communist leaders collectivized agriculture. Central authorities planned grain production, and Grain Bureaus were established to purchase, mill, and retail grain and grain products, primarily for urban and military use. Large rice mills were constructed in urban areas, increasing the availability of rice bran for feed use. Simple hammer mills to crush feed grains were erected in Guangdong, the province next to Hong Kong on China's southern coast.

But from 1958 through 1975, China endured a period of radical political campaigns that severely disrupted economic growth and development. In the Great

Leap Forward (1958-62), communal farms were consolidated into huge entities and cultivated by labor gangs, under the direction of local officials who often knew little about farming. A large portion of the harvest was procured by the government for use in urban areas. This system destroyed farmers' incentives to work and lowered production so much that an estimated 20 to 30 million people died of starvation. Largely because of the paucity of feed, livestock product output plummeted. When animal production revived after the Great Leap Forward, traditional feeding methods and technologies still predominated. Recurrent political upheavals, particularly the Cultural Revolution (1965-75), continued to disrupt agriculture and stifle the feed industry.

Over the decade of 1976 to 1985, China's leaders shifted their basic policy from heavy reliance on central planning, limited involvement with foreign trade, and an emphasis on self-sufficiency, turning instead to greater reliance on markets, more involvement in world trade, and a willingness to adopt ideas, technology, institutions, and equipment from the rest of the world. The resultant changes in rural institutions and in the general economy supported rapid growth of livestock raising, which quickly expanded the demand for manufactured feed.

People's Communes, which had previously exerted rigid control over all aspects of rural life, were disbanded and replaced by township governments and village economic cooperatives. Instead of being made to work in labor gangs on communal fields, farmers were allocated plots of land on long-term lease, granted much greater flexibility in their economic decision-making, and encouraged to maximize their income. These changes at the farm level, besides privatizing crop production, enabled rural families to earn and retain profits from raising livestock.

Marketing systems also changed. Previously, the state was responsible for purchasing most agricultural products. With the reforms, rural and urban markets reopened, giving farmers a source for purchases of feed and an outlet for marketing animal products. After prices were decontrolled as a part of the reforms, producers

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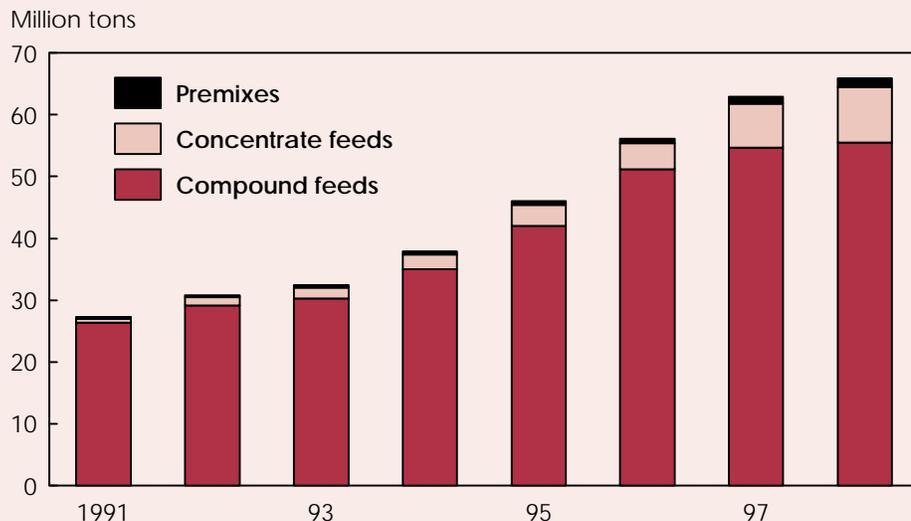
Types of Feed

A nutritionally complete feed includes three components: energy sources (typically coarse grains), protein sources (typically oilseed meals), and additives (vitamins, minerals, and drugs). As classified in China's statistical publications, *compound feed* is a nutritionally complete blend of all components, *concentrate feed* contains protein sources and premixed additives, and *premix* consists of additives combined with an edible binder to make them easier to blend uniformly.

Shares of these feed types changed over the 1990's. Initially, China's feed mills produced compound feeds and little else. In 1998, compound feed production reached a record 55.7 million tons, although its growth rate had slowed. Little concentrate feed was manufactured in the early 1980's, but by 1990 China's feed mills were producing more than half a million tons. Output continued to expand rapidly, reaching 8.9 million tons in 1998.

China began to develop a premix industry in the 1980's. At first it grew very slowly, while the country continued to import many additives that it could not manufacture at a reasonable cost. As manufacturers gained experience and skills, premix output reached 200,000 tons in 1990 and about 1.4 million tons in 1998.

China's Feed Production Grows and Diversifies



Source: Ministry of Agriculture, China, National Feed Industry Office.
Economic Research Service, USDA

were motivated to create and sell higher quality products at a premium.

Moreover, changes in the general economic system supported both a growing demand for animal products and a growing supply of manufactured feed. Rural incomes grew at a moderate rate and urban incomes increased rapidly. Consumers used their higher earnings to purchase more animal products, stimulating demand for processed feed. Meanwhile, removal of trade and travel barriers permitted feed manufacturers to import key

ingredients, technology, and equipment. In the more relaxed atmosphere of reform, technicians from China were allowed to travel abroad to become familiar with current feed milling technology, and foreign firms were invited to set up modern feed mills in partnership with Chinese entities.

China's feed industry, practically nonexistent in 1975, grew within two decades to one of the world's largest producers. The central government placed development of the feed industry high on its agenda, with twin goals of augmenting rural

incomes and improving the nutrition of China's citizens. The government played an active role, by formulating annual and long-range plans for the feed sector, building and operating thousands of its own feed mills, granting tax breaks and investment funds to other mills, and encouraging foreign firms to invest in joint ventures. Manufactured feed output increased from near zero in 1975 to over 66 million tons in 1998, expanding parallel with rapid increases in pork and poultry output.

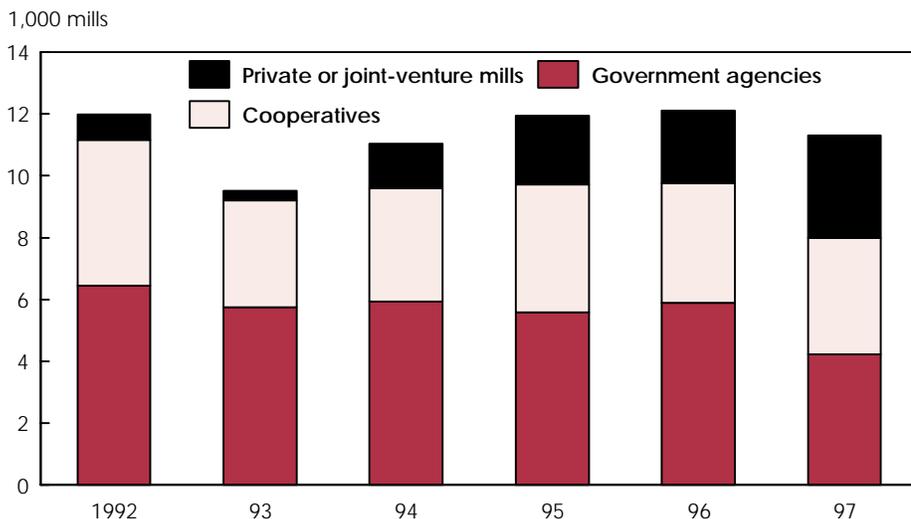
Private Ownership of Feed Mills Expands

Government mills are the most direct form of the state's role in China's feed industry. At the end of the 1980's, an impressive array of government agencies operated over 60 percent of all feed mills. In 1997, despite a rapidly rising proportion of private mills, government agencies still ran 37.3 percent of China's feed mills, according to China's Ministry of Agriculture. (Unfortunately, almost no information is available on output shares by type of mill ownership.)

Within the Ministry of Agriculture, mills are operated primarily by the Departments of State Farms (to supply state farms), Aquaculture (to supply fish farms), and Animal Husbandry. The Ministry of Commerce, specializing in the production of compound feeds, operated about as many mills as the Ministry of Agriculture through the 1980's, but has since fallen behind. Smaller numbers of feed mills are run by the Ministry of Chemicals and the Bureau of Pharmaceuticals (to produce feed additives) and by the Ministry of Mechanization, often in partnership with other entities, to gain practical experience in manufacturing feed milling equipment. The Ministry of Foreign Trade has cooperated with foreign firms in establishing joint venture feed mills, particularly in the 1990's. Military units commonly operate farms and livestock feeding operations to provide food for their own personnel. The number of military feed mills expanded from 2 in 1991 to a peak of 50 in 1996.

Cooperative feed mills were formed in the early 1980's as communes disappeared. These mills in townships and villages, often called Township-Village-Enterprises

Private Ownership of China's Feed Mills Expands



Source: Ministry of Agriculture, China, National Feed Industry Office. Economic Research Service, USDA

(TVE's), are collectively owned by local farmers. The cooperatives are nominally supervised by officials from the Ministry of Agriculture. But in practice, local officials oversee their operations. Many small, inefficiently run TVE mills succumbed to competitive pressures in the 1980's. The survivors had managers who were adept at organizing efficient, productive units. In 1997, 3,770 TVE and non-TVE cooperative mills comprised 33.4 percent of China's feed mills.

Privately owned and joint-venture mills are increasing as well. Relatively few mills, perhaps 5 percent, were privately owned and managed at the end of the 1980's. By 1997, privately owned mills and public/private joint ventures accounted for 29.3 percent of all mills. The 3,316 mills in this category included 221 domestic private mills and 275 joint ventures between private foreign companies and China's government agencies.

Joint venture and foreign-owned firms—mainly from Thailand, the U.S., Japan, Great Britain, and the regions of Hong Kong and Taiwan—have significantly influenced state and cooperative feed mills by introducing new feed formulas, milling techniques, management methods, and marketing practices. By sharpening competition within the feed sector, foreign firms and joint ventures created an

environment in which both government and cooperative mills had strong incentives to become more efficient.

Since China's government intervenes in both domestic and international grain and soybean trade, some joint venture and foreign-owned feed mills have had difficulty finding reliable supplies of raw materials. Because of these uncertainties, and also to

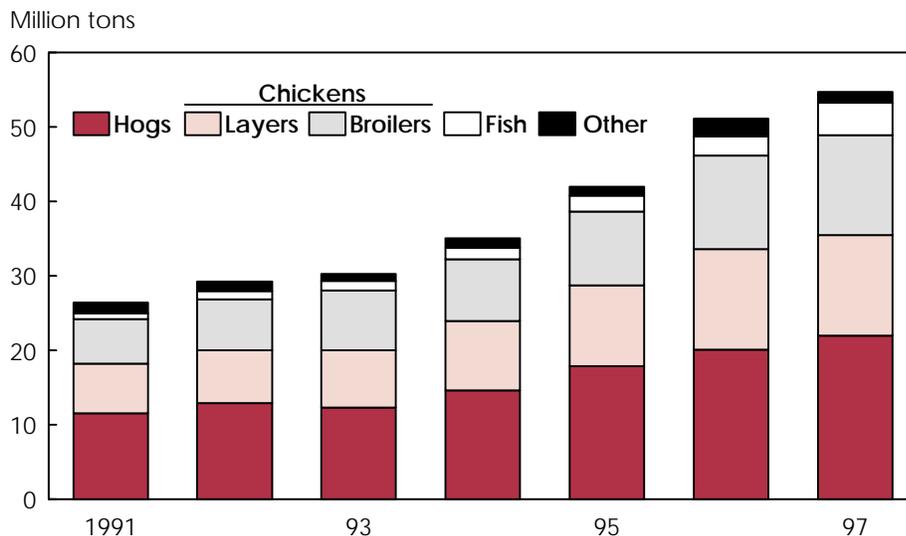
earn higher profits by using their specialized knowledge, many foreign-owned and joint-venture feed mills have focused on manufacturing premixed additives. They sell these expensive, high-tech ingredients to local feed mills and large-scale farms, to be blended with oilseed meals and grains.

Feed Mills Target Local Livestock Operations

China is the world's largest *swine* producer. Pork is by far the most popular form of meat and constitutes 67 percent of the country's meat production. In the early 1980's, almost all manufactured feed went to hogs. As poultry and aquaculture production expanded, the share of compound feed mixed for hogs fell to 56 percent in 1990 and 42 percent in 1998. However, the tonnage of hog feed produced is still increasing. In 1998, compound feeds manufactured for hogs reached a record 23.4 million tons. Feed mills typically are situated in animal producing areas because China's transportation and related infrastructure are poor. Hog feed manufacturing, for instance, is concentrated in the Yangtze River basin.

China's *poultry* industry expanded rapidly in the late 1980's and 1990's. In response, mills stepped up production of compound feed for egg layers and for broilers. Total

Most Compound Feed in China Is Fed to Hogs and Chickens



Source: Ministry of Agriculture, China, National Feed Industry Office. Economic Research Service, USDA

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feed manufacturing for poultry increased from 10.5 million tons in 1990 to 26.6 million tons in 1998, and from a 40-percent share of compound feed in 1990 to a 48-percent share in 1998. Mills making feed for layers are concentrated in China's northern plains, while those specializing in broiler feed production are concentrated in coastal areas.

China has the world's largest freshwater *aquaculture* industry, which absorbed 6.6 percent of the country's total compound feed output in 1998. Fish feed production was 3.7 million tons in 1998, having grown at an average annual rate of 18 percent since 1990. Fish feed manufacture and (to a lesser extent) aquaculture are concentrated in the Yangtze River Delta.

Small quantities of compound feed go to *ruminant animals*. Dairy cows consume around 3 percent of China's compound feed. Beef cattle, sheep, and goats mostly graze, and consume very little manufactured feed.

Feed is marketed primarily through local stores, although some mills also sell directly to large livestock operations. Differences in ingredient composition across brands are minor, and feed stores carry multiple brands. Although feed manufacturers own no retail outlets, some large feed mills conduct training seminars for farmers, pointing out benefits of feeding a balanced, nutritious diet. The staff of local feed stores, supplemented by people running mill seminars, have largely replaced government farm extension agents in explaining feeding technology.

Many mills use sales representatives to broker sales contracts with local feed stores, and sometimes with major livestock producers, offering a comprehensive service plan with credit terms. Because of recent, steep declines in prices for animal products, collecting feed payments is a growing problem. Since most local feed stores and most farmers lack access to bank credit, customers facing financial difficulties are often allowed an extended payment period.

The two leading nationally distributed feed brands are CP (a joint venture with a Thai feed manufacturer) and the Hope Group (a domestic company owning many mills). The combined market share of these two companies, however, is still small—likely below 15 percent in 1998.

Joint-venture and foreign-owned companies have complained about pirated or falsified labels. Shoddy counterfeits damage mills' reputations as well as sales. A set of Feed and Feed Additives Regulations that went into effect on June 22, 1999 should help the industry weed out substandard products and falsified labels.

China to Import More Coarse Grains & Oilseeds

In 1998 and 1999, repercussions of the Asian financial crisis reduced demand for China's exports abroad. Meanwhile, cutbacks in the government bureaucracy and ongoing privatization of the still predominantly state-run manufacturing sector worsened underemployment and unemployment at home. Consumer uncertainty contributed further to a drop in domestic demand, and prices fell for many products. In particular, meat prices fell—especially for pork, which cost about half as much in April 1999 as a year earlier. Over the first 6 months of 1999, China's total output of compound feed was an estimated 10-percent lower than in the first half of 1998, due almost entirely to a sharp decline in hog feed production.

Despite these short-term setbacks, the medium- and long-term outlooks for China's feed manufacturing sector remain bright, as do prospects for greater U.S. exports of feed ingredients. Several factors underlie this optimism.

- China's economy, hard hit by the Asian economic crisis, now appears to be in the early stages of recovery.
- China's low per capita consumption of animal products, even compared to countries with similar average income levels, leaves ample room for growth in demand, and for a parallel expansion of its feed sector.

- China's feed manufacturers are sophisticated. Alone or in joint ventures with foreign firms, government and private mills already produce a wide variety of feed types and feed ingredients.
- The newly implemented Feed and Feed Additives Regulations, which emphasize labeling, grades and standards, and orderly marketing, will help smooth the industry's expansion by weeding out substandard products and falsified labels.
- The feed industry has the potential to expand rapidly, because China manufactures—and even exports—feed milling machinery.

For U.S. exporters of oilseeds, oilseed meals, and feed additives, medium- and long-term prospects remain positive as China's livestock and feed sectors prepare to respond to growing consumer demand. Expansion of its feed manufacturing sector will require China to import more oilseed meals and more oilseeds for crushing. China's meal production from domestically grown soybeans is currently about 6 million tons, far short of the country's estimated demand for 20 to 30 million tons of oilseed meals annually over the next decade. China also produces about 1.7 million tons of meal from rapeseed and cottonseed, but toxic components naturally present in these products limit their use for feeding animals.

China may become more willing to import coarse grains too, despite its continuing reluctance to import bagged feed. The country is now eliminating price supports for low-quality grains, having discovered the enormous cost of storing surpluses. China's recent exports of feed-quality grain represent the disposal of old, deteriorating grain originally purchased for China's food security stockpiles, rather than feed grain production in excess of domestic demand. **AO**

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