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Profiles of the Chinese pig industry

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No matter who you ask, the answer will be the same: China is the number one pork producer and consumer on this planet. In 2000, 527 million pigs were slaughtered and nearly 50% of all pork in the world is now produced in China (NBSC, FAO, USDA, 2002). 1.3 billion Chinese consumers seem to prefer pork over any other meat; essentially all pork produced in the country is consumed domestically.

Depending on who you ask, you will receive different answers about the profile of the Chinese pig industry. In 1999, a survey conducted by NBSC (National Bureau of Statistics of China) revealed that households in rural China raised an average of 1.48 pigs (NBSC, 2000). One person of every eight in the world is a Chinese farmer. Another frequently quoted statistic is that about 80% of all Chinese pigs are produced in the backyards of farmers' homes. Reports prepared in 2002 by hog industry associations in Zhejiang, Shanghai, Beijing, and Guangdong provinces proposed that 40–50% of the hogs were produced on 'scale farms' in those provinces. However, it is difficult to precisely define a 'scale farm' and validate the reports without more reliable data. What numbers correctly describe the profiles? The reality may be simple: no comprehensive study completed to date has profiled the industry with any degree of accuracy.

Increasing market openness following China's accession to the World Trade Organization, continued income growth, and the shift of food consumption patterns towards more meat have attracted more and more attention to the Chinese pork industry from the rest of world. This report will provide an overview of the pig industry in China by exploring the production costs and major constraints on several swine producers. Key factors and issues will illustrate what differentiates the Chinese pig industry from other countries and what direction the industry is heading in the future.

Overview and issues affecting the Chinese pig industry

There is no question that the demographics and economics of China's rural sector are the predominant drivers of the Chinese pig industry. In 2000, there were 928.2 million people and 241.5 million families living in rural ar-

reas, accounting for 72% of the total population of 1.3 billion. Rural families have very limited assets available for production activities—a person in an agricultural area only possessed assets valued at US\$565.5 in 2000 (NBSC). For a long time, raising one or two pigs in the backyard has been a low cost investment for a rural family in terms of utilizing grain byproducts and food residues (Figures 1 and 2). It is, therefore, understandably difficult to arrive at an exact number of 'farms' engaged in pig production.

The opportunity cost of agricultural labor has been so low that the salaries for family members involved in pig production are often not treated as part of the costs. This is particularly true when a family has one or two pigs in the backyard. These pigs do not interrupt other farming activities, the national average size being only 0.4-hectare land. However, raising one or two pigs in the backyard can be a reasonable source of cash for the family to purchase meat and basic supplies, and pay tuition for children. Lower incomes in agriculture areas have intensified competition in job markets all over the country, further worsening the situation in rural areas.

Most reports suggest that the majority of Chinese pigs are produced in backyards. However, these statements are made with little substantiation. I think that these reports are conservative and there is a movement away from backyards to specialized households or large farms. Having traveled extensively in the country and having visited swine farms of various sizes for more than five years, I see that we are producing more pigs in specialized household farms and large scale farms. It appears that about 50% of pigs are produced on farms that sell fewer than 50 pigs a year, while about 30% from medium-size farms. Less specialized household farms normally have sows, but an increasing number of them—close to big cities—simply buy feeder pigs from large farms in the area. Large farms tend to be farrow-to-finish (Figure 3).

Several studies suggested that the price elasticity of pork demand is very high in the Chinese food market. But the authors of this paper argue that pork, as a percentage of meat in the typical Chinese diet, remains rather stable. Although the uncertainties of family income and volatility of the general economy may reduce total meat consumption, pork still makes up the largest share by far in

Figure 1. Hogs and pork produced by rural families

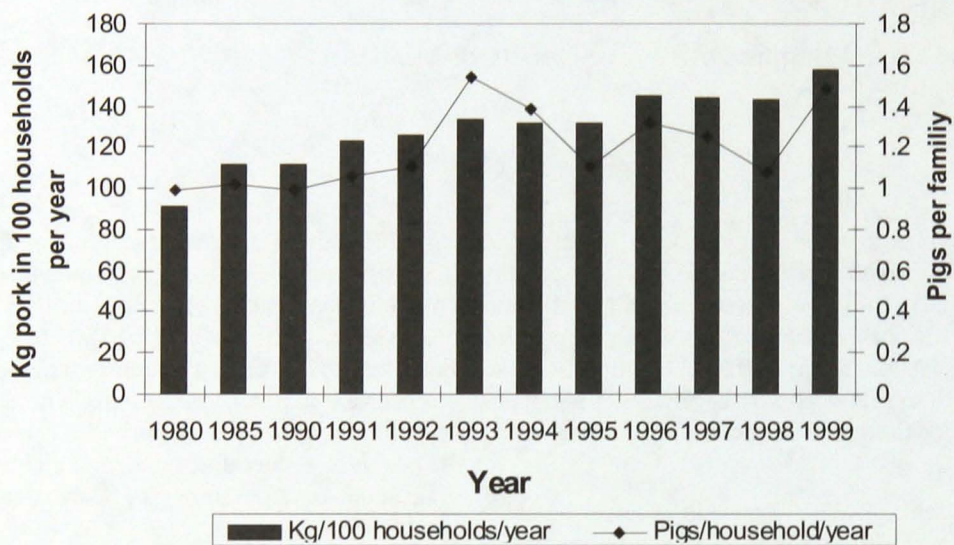
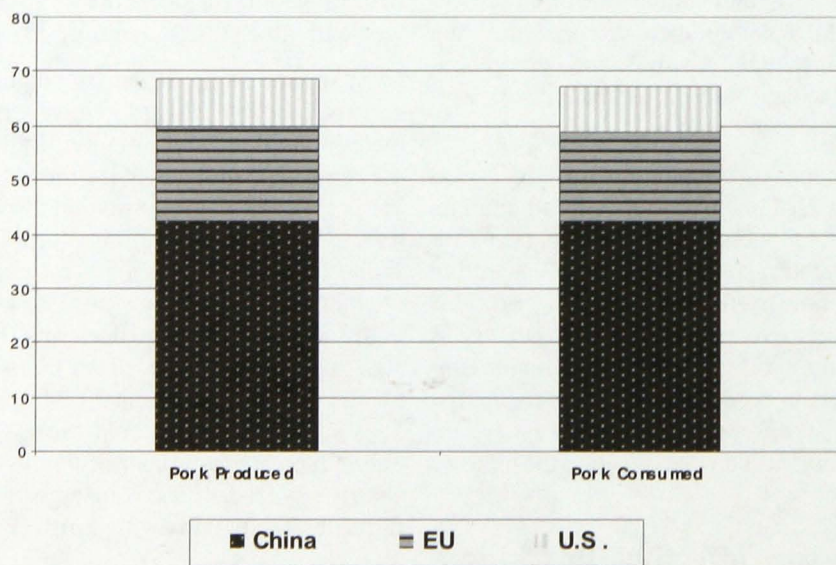


Figure 2. Profiles of world pork production in 2001



Chinese diets (Figure 4). It is questionable to assert that price elasticity of pork demand in China is greater than that of beef or fish.

Animal husbandry around major city suburbs was once encouraged by the government to fill the 'food basket' projects for urban residents. This resulted in development of large swine farms since the early 1980s. Many of those large farms have now become more involved in swine breeding to provide genetics for small hog producers. Farms in inland provinces such as Henan, Hebei, and Hunan now produce more commercial pigs for big cities like Beijing, Shanghai, and more developed provinces such as Guangdong. State-owned pig farms close to cities have benefited from providing better breeding pigs

during the industry transition among most specialized households and commercial farms.

In China, hog and pork prices may reflect the true market environment because of the difficulty in estimating the number of pigs and farms. Significant differences in regional hog and pork prices obviously are major reasons why such large numbers of hogs are moving from inland provinces (Henan and Hebei) to the Guangdong, Shanghai, and Beijing areas (Figure 5). Recently improved infrastructures, especially new highways, add momentum to the change of live animal transportation. Instead of moving grains and other major feed ingredients, shipping

Figure 3. Chinese pig industry profiles: Pigs sold by different farms

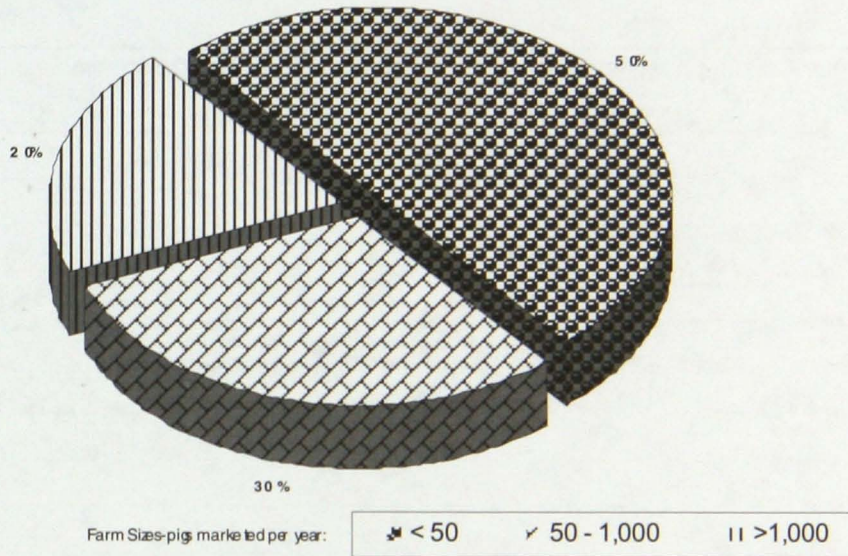


Figure 4. Portion of pork in total meat produced in China

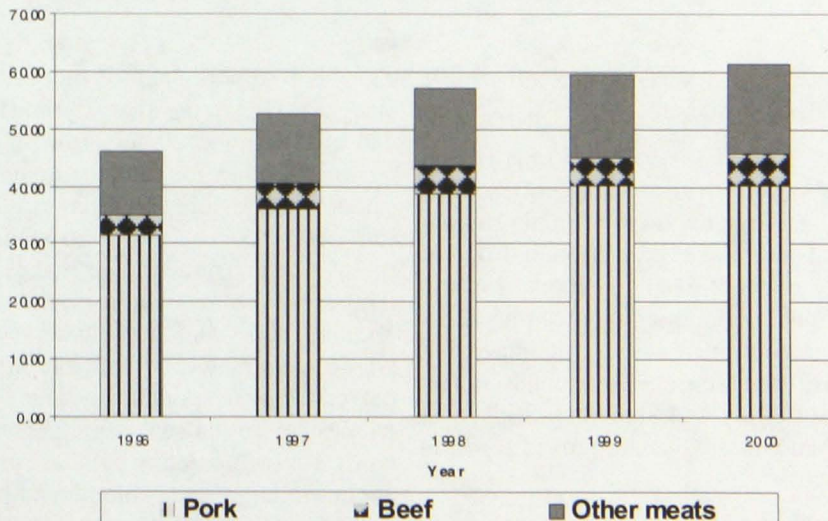


Figure 5. Top 5 provinces in pig production in China

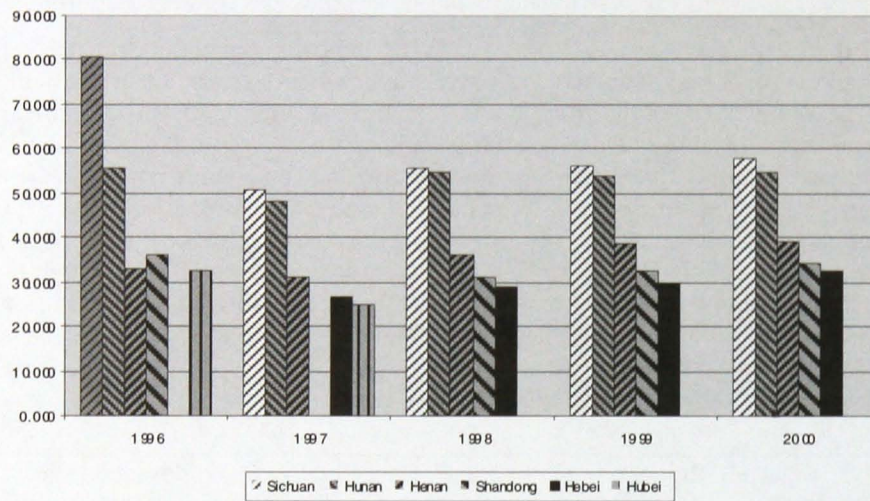
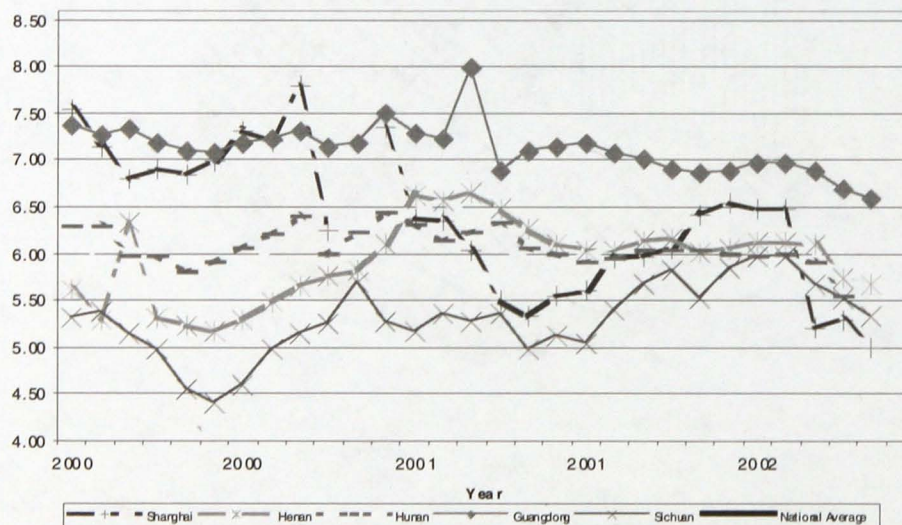


Figure 6. Pork prices in top production and consumption provinces in China



live pigs to pork consumption areas is becoming more cost effective for fresh meat markets.

The great majority of pork that is sold in China is sold fresh. Thus the lack of local fresh meat markets often limits the growth of farm size. Tight regulations on pig slaughter by the government and market protection in different areas restrict free movement of live hogs. Expansion and integration of pig farms in inland regions are thus difficult in this business environment despite the increasing production costs and tightening environmental control around big cities like Beijing and Shanghai. Still, most pigs supplied for urban populations are moved live and slaughtered in the cities.

The Chinese pork chain is unique. Wholesalers pay toll slaughter fees to the slaughterhouse and then sell warm carcasses to pork retailers or meat stands. The system is characterized by the dominating position held by wholesalers who are able to overcome some of the infrastructure obstacles. The dispersed nature and small scale of production and retail outlets makes it difficult for slaughterhouses to source live hogs and deliver carcasses to the retailers. This situation provides an environment in which wholesalers play a critical role in connecting the other players along the pork chain. This system also affords the wholesaler an unusual degree of market power and potential for manipulating purchase price. This system even applies to large-scale commercial pig producers because it is often difficult to manage a large number of sales rep-

representatives if a farm tries to enroll its own wholesalers. Producers often complain that wholesalers who normally do not invest in many assets capture too much value in the pork chain. Logistics between producers and consumers have become significant constraints for the Chinese pig industry as a whole.

Live pigs exported to Hong Kong have a significant impact in many major hog production areas as pork/pig quality in the Hong Kong market is essentially measured by visual judgment. Many breeding farms select export pigs for their small head and long body with very heavy hams. This practice ignores the real value of breeding pigs and many other merits of breeding animals, such as maternal performance and meat quality. Unfortunately, high prices attract many breeders to follow these trends.

Some observers outside of China are very suspicious about the health status of Chinese farms, but it may not be fair to assume the entire Chinese pig industry suffers from endemic problems. Most medium and large swine farms tend to have strict biosecurity controls, with disease problems similar to many other regions in the world. What is often lacking is an infrastructure to diagnose and control new disease outbreaks.

To describe the Chinese industry in greater detail, we will present three cases to characterize the differing strata of Chinese pig production. Not only are rearing technologies different, but the pigs, markets, and production drivers vary greatly.

Case 1. Ms. Yan: Struggling backyard producer

Ms. Yan is 64 years old and has been raising two pigs for the last 40 years, except for several extreme years in the early 1960s when many people died of famine. She and her husband re-built their house in rural Shandong province at least six times in the past 40 years.

In those very difficult years, amid the Cultural Revolution, three or four pigs a year could add significantly to family revenue. Food grain (mainly wheat) was never



Table 1. Operation description for Ms. Yan's two-pig farm

Items	Note
Feeder pigs Purchased from local bazaars at about 15–23kg and about \$0.85/kg.	2- or 3-way crossbred. Pay can be deferred as short-term debt.
Feed Only about 10% of the feed is grain, protein meals, and/or premixes; others are food residues with no cost.	Only feed small amounts of grain at early and late stage.
Days to market About 200 days from 20kg to 65kg.	
Market pigs Sold to dealers or on local bazaars. Live weight price varies from \$0.65–\$0.80/kg in 2002.	
Manure Stored in a open pit for field application	Considered to have value.
Labor and veterinary care Time used for buying and selling pigs and cleaning; vets and drugs cost about \$10 per pig.	No opportunity cost for labor included.

sufficient for four young children in the early years. Selling a pig two or three times a year allowed for the purchase of other foodstuffs.

Advantages of backyard production

- Enter or withdraw business to/from pig industry at essentially no cost.
- Production flow is totally adjustable depending on market price.
- Two or three pigs sold per year used to account for 30–40% cash income for her family but now may be down to only 10%.

Disadvantages and constraints

- No leverage power on inputs and product prices.
- Diseases can cause serious problems and losses.
- More difficult to find market and sell pigs owing to higher cost of transportation, thus usually receive lower prices.
- Always the lowest price receiver no matter how much you improved genetics.
- Young generation consider odor a problem and neighbor's complaints of odor. Decreased interest in

Table 2. Consolidated balance sheet for Ms. Yan's two-pig operation: June 30, 2002

Assets	Amount (US\$)	Liabilities	Amount (US\$)
<i>Current</i>			
Cash for feed and vets	42	Short term debt for feeder pigs	19
4% premix and other feed in store	9	Taxes payable	4
<i>Fixed</i>			
Pig shed, trough, and tools	133		
Pigs	77		
		Total equity	238

Table 3. Estimated consolidated income statement for Ms. Yan' two-pig operation: December 31, 2002

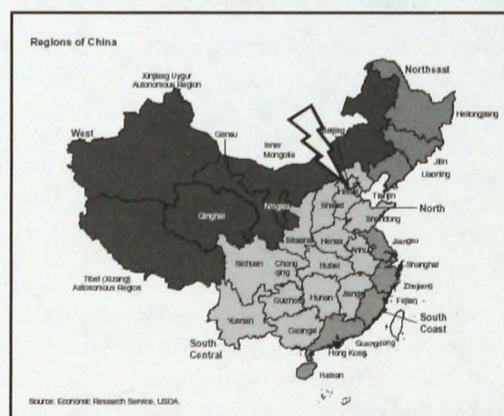
Items	Amount (US\$)	Note
<i>Revenues</i>		
Pigs sold	141.50	3 pigs sold a year
Manure collected for fertilizer use	29.00	Opportunity cost
<i>Expenses</i>		
Buy feeder pigs	21.50	
Grain and protein meals	13.80	8% of feed
Premixes	2.80	5kg total
Labor	65.00	Normally not included
Vets and drugs	7.30	
Others	6.50	
Depreciation	2.70	
Net income before taxes	50.90	
Net income	48.90	3-5% taxes and fees
Net income per pig	16.30	

pig production by younger generation. Actually, backyard pig production is disappearing in areas around big cities.

- Opportunity cost of labor has been noted and begins to increase.

Case 2. Mr. Li: Specialized household production grows

There is no clear definition of a specialized household in terms of size and other characteristics. Generally speaking, a household is considered specialized when a family makes more than 60% of their income from one business, in this case hog production. In China, a specialized household can produce 20 to several thousand pigs a year depending on the region in which it is located.



Mr. Li was born and has been living in a rural county of Beijing for 38 years. His family, a wife and two sons, used to raise one or two pigs in the backyard several years ago. Now the village where Mr. Li lives does not allow pigs in the yards but permits land leasing for animal production outside the village. Mr. Li resigned from a job in town, leased 0.3 hectares of land from the government, and built a 27-pen pig farm for farrow-finish production.

Mr. Li housed 6 sows, 2 gilts, and 2 boars in 11 pens in one of the three rows of buildings and used the other 16

Picture 1. Mr. Li's specialized household farm



Table 4. Operation description for Mr. Li's six-sow operation

Items	Note
Gilts Purchased from local breeders, but Mr. Li is considering selecting gilts on his farm.	Gilts stay on farm about 30 days before the first service.
Boar Purchased from local breeders. He owns one Landrace boar and Piertran-Duroc crossbred boar.	There is a demand in the local market for 2-way crossbred pigs from Landrace and Yorkshire.
Feed He uses 4% premix, corn, wheat bran, and soybean meal to mix meal feed for all phases. Premix providers also sell ground corn, meals, and lysine, DCP, etc., and provide formulation. Mr. Li also grinds corn and wheat on-farm.	Mr. Li's concerns include paying higher prices for feed because far scale is still too small to leverage with feed providers.
Days to market About 190 days from birth to 92kg.	Mr. Li is frustrated by the variation of pig market weights. He always blames bad genetics.
Market pigs All sold to one or two dealers/wholesalers. Live weight price has been slightly higher than pigs from backyards at about \$0.73 to \$0.90/kg.	Wholesalers like to purchase pigs from limited group of small farms order to ensure constant supply and less price volatility.
Manure Sold to local fruit growers.	The farm does not store manure.
Labor and veterinary care Mr. Li works full-time on the farm and hires no labor. He occasionally pays veterinarians for advice and services but not often.	

Table 5. Consolidated balance sheet for Mr. Li's six-sow operation: June 30, 2002

Assets	Amount (US\$)	Liabilities	Amount (US\$)
<i>Current</i>		<i>Current</i>	
Cash	363	Short term debt for feed, etc.	604
Inventory of market, grower pigs	166.8	Taxes payable	193
Feed in store	363	Other payables	19
Supplies	109	<i>Non-current</i>	
Fixed Buildings	6,046	Long term debt from friends	2,500
Land tenure for 20 years	151	Land leasing, per year	24
Tools and equipments	489		
Others	35	Owners equity	4,382.80

pens to raise all pigs after weaning at about 35 days. Sows stay in the same pen for breeding, gestation, and farrowing.

Advantages to a specialized household pig production:

- Relatively low investment in fixed assets.
- Government support for land leasing cost, genetics, and tax cuts.
- Dealers pay higher price than backyard producers.
- Normally do not need outside labor.

Disadvantages and constraints:

- In single-site, continuous-flow production, technical and management skills are critical. Services from feed and drug providers are often confusing and even misleading.
- Sources of capital for small businesses are scarce in China. Shortage of working capital increases costs of feed and gilts.

Table 6. Estimated consolidated income statement for Mr. Li's operation: December 31, 2002

Items	Amount (US\$)	% of total costs	Note
<i>Revenues</i>			
Market pigs sold	6,697		86 pigs sold a year
Feeder pigs sold	304.6		15 piglets
Manure sold	66		
<i>Expenses</i>			
Total feed	4,081	65.3%	
Gilts and boars	218	3.5%	1 boar and 1 gilt
Feed mixing fee	135	2.2%	
Labor	1,452	23.2%	
Vets and drugs	241	3.9%	
Others	122	2%	Interests etc.
Depreciation	412		
Net income before taxes	406.6		
Net income	390		3-5% taxes and fees
Net income per pig	3.87		

- Logistics become more critical. Normal households do not have transportation to move feed and pigs, which reduces their competitiveness and increases costs.
- Diseases can be significant threats, compounded by the lack of knowledge to manage them.
- This segment has little leverage on market pig prices.

Case 3. Mr. Yuan and Mr. Jiang: Privatization of state-owned farms and emerging integration

Mr. Yuan

DLS Farm, a subsidiary business of a state-owned company, had 5,500 sows on two sites in Guangdong until the end of 2000. Its target market has been the high-value

live hog export market to Hong Kong. Mr. Yuan, the general manager, has been managing the farm for about 15 years as an employee of the local government.

Industrialization and urbanization increasingly cause concerns over water and air pollution and, thus, add much pressure on the pig farms in the area where DLS is located. Despite efforts to remain in their original location DLS was ordered to close the farm and liquidate the business in 2001. They are now selling all 3,500 sows on the breeding farm immediately after weaning.

Mr. Yuan is a man with vision. He had realized that development in the area around his farm was so rapid that he would have to close the farm soon. He and 11 other key technicians had started building their own farm in a nearby county in 1999 with no objections or conflict-of-interest raised by his existing employers, the state-owned company. The new, private-owned company has 1,200 sows mainly as a breeding farm. Of course, Mr. Yuan did not refuse the opportunity to 'buy' the best sows and gilts from DLS for their new farm.

DLS Farm will not be the only case where the Chinese government adjusts the policy to encourage privatization in small- and medium-sized companies. Many state-owned pig farms tend to lack incentives to motivate the management and other employees to perform well in the current quasi-marketplace in China.

Mr. Jiang

Mr. Jiang, the owner of Shunde Changjiang Group, is a different success story. Mr. Jiang was one of the first generation of young people able to receive a college edu-



cation after his family suffered severely in the 10 years of the Cultural Revolution. He was assigned to be a government official in an Agriculture Bureau after graduation in early 1981. Economic reform started in south China where Mr. Jiang lived and generated many opportunities for entrepreneurs and ambitious individuals like Jiang. In 1994 he resigned from the government and started his business as a small grain trader and feed manufacturer. Apparently he earned his first barrel of gold very quickly when live-stock production prospered at that time. He then expanded his feed mill and started a pig farm.

One of the gifts Mr. Jiang possesses is an understanding of how to build core competitive advantages for a company through low cost expenditures and acquisitions. He was encouraged when he managed to build a joint venture slaughter plant with the government, which gained his company significant competitive advantages in the market because slaughtering was very tightly regulated by the government owing to food safety concerns.

- In 1997, Mr. Jiang purchased a state-owned timber plantation with 600,000 hectares of forests in which to locate his 2,500-sow swine nucleus herds, providing breeding stock for 11 commercial pig farms in Guangdong and Hong Kong.
- In 1998, Mr. Jiang's company purchased Taishan Food Group, which enabled exclusive control of all packing plants in the area.
- In 2001, Mr. Jiang purchased 36 markets in the area where most retail fresh pork are sold. In the same year, his company acquired the large state-owned food group company and its three slaughter plants in Jiangmen, neighboring Taishan.
- Two 5,000-sow farrow-finish farms are under construction now.

Currently Mr. Jiang's group company has 89 farms and plants involved in feed and pig production, pork processing, and fruit and timber farming. The company sells 900,000 market pigs a year and slaughters 1.2 million for both domestic and export markets. Mr. Jiang plans to produce 2 million pigs and develop production of chilled pork for the emerging market in 1 or 2 years.

Emerging issues

Industrialization, continuous reform, and opening to the outside world are bringing about many changes in the Chinese pig industry. Observers and researchers interested in the Chinese pig industry are studying the issues currently emerging in the country in order to sketch an outlook for the Chinese industry.

Concerned about potential problems caused by reductions in rural incomes, the Chinese government, with a long

history of planned economy, will probably continue to provide various supports to the households in agricultural areas. Pig production is one of the sectors selected by the government to help raise farm incomes. The trend towards household specialization and expanding farm sizes will continue in the hope of increasing production efficiency.

Although the pace toward privatizing state-owned swine farms is not rapid enough to meet industry expectations, the resolve of the government to drop the long-suffered burden of poorly managed farms is evident. In Guangdong, local governments have already liquidated many swine farms, facilitating their purchase by farm managers and technicians at very reasonable prices. One popular model is to let the managers own up to 40% of net assets/equity and other workers are allowed to purchase the rest. After the reform the state may or may not retain shares in the business. Managers normally have to pay cash or amortize the initial cost of the transaction. They are even allowed to buy out the farm using the future earnings in some areas. In addition, the value of a pig farm will be assessed well below the real value in order to make it affordable for managers. Newly created private swine farms can be very competitive owing to the low fixed costs and total assets, at least in a short term.

In addition to an immature market economy, poor infrastructure, and lack of logistics to handle live animal and chilled pork will remain a major constraint for a long time. Other aspects, like production efficiency, are also major constraints for many Chinese swine farmers to overcome. This is not limited to technical skills. Perhaps more important is the lack of basic management skills required to add economic value to a swine operation.

Chinese consumers looking for quality and flavor seem willing to pay higher prices for pork. Pioneering companies have reported success in value-added products when they try to emphasize pork quality by cross-breeding lean pigs with local Chinese breeds. Several food producers have already opened specialized stores or supermarket counters for 'local-flavor pork.' The broiler industry experienced a similar change in several provinces in southern China where the fast-growing broilers have now mostly disappeared from the markets owing to unfavorable quality.

Food safety has recently spurred a great deal of public concern in China owing to a spate of cases where pork was contaminated. In the past three years, several human fatalities have resulted from pig farms deliberately adding clenbuterol to increase pig lean content. Complaints and anger from the public have forced the government to impose tighter control and establish strict new laws for quarantine and inspections. This change could potentially deter the entry of small pig producers and reduce the number of backyard producers who have less control over product quality. Branded products from large-scale pig

farms could gain advantages if they can differentiate their products in the market.

China's WTO accession, along with food safety concerns, could facilitate foreign pork producers' entry into the high-end of the Chinese pork market. Imported pork may satisfy the needs of high-end consumers, consumers in urban areas, and foreign tourists. However, whether local consumers will purchase imported pork is difficult to predict and will depend on growth in their disposable income, changes in consumer preferences, and other socioeconomic factors. Even under more favorable market conditions after WTO, foreign investors in the Chinese pig industry still seem cautious. Until now, limited amounts of foreign capital have been brought into breeding businesses and a few packing plants. It seems to be too early to evaluate the impacts of foreign investment. From television sets to laptop computers, all consumer products have become, to some degree, commodities in China now. The question is: Can foreign pork producers entering the Chinese market differentiate their products? If not, imports are unlikely to succeed, as competition on price is difficult.

In many respects, the current industry is quite efficient at delivering product from the farm to the table. Processing, marketing, and transportation costs are often relatively low. Cold storage facilities are limited and the fresh pork market still predominates. As demand increases, it is more likely that the demand for pork will be met internally. Pork production has a very long history in China and farms can be placed in rural areas quite easily. Farms will be placed where grain supplies are adequate and markets are available. Chinese pork producers like better genetics and farm equipments from foreign countries. The massive infrastructure investments in China will allow greater ease in transportation of these grains and also sales. In many ways it can be argued that China may well become an exporter of pork, especially of loins, as the industry matures.

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