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Managing the pork supply chain through a cooperative: the case of Jinzhong Food Co. Ltd.

CASE STUDY – WITH TEACHING NOTE

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Abstract

Food security and supply continuity have become main concerns of food companies and societies nowadays. To address these concerns, Jinzhong Food Co. Ltd. (hereafter abbreviated to Jinzhong) was one of the first Chinese meat companies to establish and integrate a pig production cooperative in 2005. Over the last decade or so, Jinzhong has successfully developed the cooperative to stabilize and improve the quality of pig supply, by building relationships with pig producers (farmers) and achieving an exceptional financial performance in the process. The company-led cooperative represents an innovative supply chain governance mechanism in a Chinese context. However, the pork industry has evolved significantly and the time has come for the senior management team at Jinzhong to decide whether or not to keep the cooperative. This case study is aimed at senior undergraduate students and postgraduate students specializing in agricultural economics/agribusiness and can also be used for executive training for the management of food companies.

Keywords: pork supply chain, farmer's cooperative, case study

JEL code: Q13

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1. Introduction

Jinzhong Food Co. Ltd (hereafter abbreviated to Jinzhong), located in Qionglai, a prefecture belonging to Chengdu, the capital of Sichuan Province in China, is a leading pork production/processing company in south west China.

On a hot summer morning in June 2005, Mr. Gou Mingjun, the Deputy Bureau Chief at the livestock bureau in Qionglai, rushed into the office of Mr. Liu Xiang, president of Jinzhong saying: 'look Lao Liu, some epidemic diseases are prevailing in our surrounding areas, and I am really concerned because they may soon reach our county. We have got to work together to prevent these diseases. What do you suggest we do?' Mr. Liu responded: 'firstly, the government needs to encourage farmers to use epidemic vaccinations so that their farms will not be affected. Secondly, we could create an organization so that remote farmers are organized; then we can get to know their pig production processes better, and we can train them on a large scale to prevent disease on their farms in the long term'. Liu added: 'establishing an organization would also be good for our company, because we could contract farmers to sell their pigs to us. As a result, we would obtain a more stable and high-quality pig supply'. 'So, what kind of organization shall we build, and how shall we build it?' Mr. Gou's words got them both thinking.

After this meeting, Mr. Gou and Mr. Liu had several rounds of discussions. Gou discovered that there were some cooperatives in the fruit and vegetables industries, and thought it would be a good idea to establish a cooperative led by Jinzhong. Liu was excited by this idea, and in August 2005 they decided to set up a cooperative called 'Jinli' with the support of Jinzhong company, the Qionglai county government and local small pig farmers. It was the very first cooperative in the pig industry in China. Between 2005 and 2015, Jinli cooperative brought benefits for both Jinzhong and local pig farmers. Small pig producers were able to improve their pig production thanks to the guidance and training offered by Jinli cooperative; and Jinzhong has a more stable source of healthy pigs by contracting with local farmers.

However, there are problems facing Jinzhong during its coordination with Jinli cooperative. As there are huge price fluctuations on the market in China, small pig farmers in the cooperative regularly breach their contract with the cooperative depending on changes in the market. In addition, it is impossible for Jinzhong to control the quality of the pigs from smallholder farmers completely, because Jinzhong is not able to monitor the whole production process of its member farmers. This raises potential quality risks for the company. For Mr. Liu Xiang, food security and a stable supply of high quality pork are top priorities on his agenda. The case will illustrate how Jinzhong has managed its supply chain with Jinli cooperative, describing the benefits and problems Jinli cooperative has brought in the last decade. Thus, it aims to trigger the readers help Mr. Liu Xiang to make a decision: should Jinzhong continue, side-line or even phase out the cooperative in the future?

2. Pork supply chain in China

The pork supply chain includes many different chain actors, such as feed producer, pig farmer/producer, slaughterhouse, pork processing companies, various kinds of pork distributors and pork consumers (Figure 1). Breeders in the pork chain breed pigs and sell piglets. They choose breeds with the best reproductive and biological characteristics to produce good piglet breeds. The three most famous breeds in China are Changbai, Taihu and Rongchang, which are found mainly in North-eastern China, Yangzi area and Chongqing respectively. In the last 30 years, China has imported many foreign breeds, such as Duroc and Yorkshire, which are crossed with Chinese pig breeds.

Feed producers are companies that produce feed products for the livestock and/or the aquaculture industry. The feed industry is approaching market saturation due to over-production in China, so competition is concentrated on price. Pig producers are farmers who fatten pigs and sell these to slaughterhouses. Slaughterhouses are companies that slaughter live pigs and cut these into meat products. In China, companies wanting to operate in this industry must obtain a slaughterhouse permit, which is difficult to acquire. The processing industry

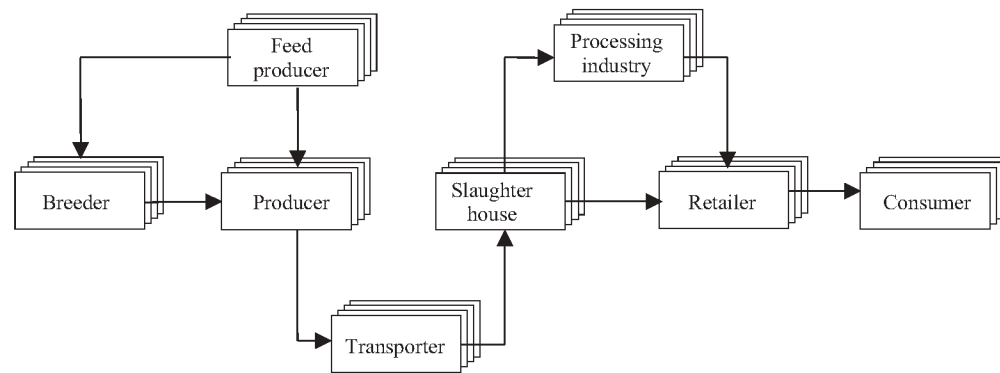


Figure 1. A typical pork supply chain (adapted from Trienekens *et al.*, 2009).

converts the meat into end products, such as sausage and bacon. Slaughterhouses and processing industries in China's pork chain tend to be the focal companies (playing the central role in the chain) as they collaborate with pig farmers upstream in the chain to ensure pig supply and safety and work with retailers downstream in the chain for branding and marketing. China is the world's leading consumer of pork.

In the countryside live pig transportation is still common, and is considered one of the causes for the transmission of pig diseases, due to unhygienic transport conditions and the spread of diseases from sick pigs to healthy pigs during transportation. Fresh pork transportation is usually carried out by slaughtering and processing or logistics companies in vehicles equipped with professional cooling systems.

In China, there are five main types of governance structure between focal companies (processors and slaughterhouses) and farmers, which are illustrated in Figure 2. From left to right, a company may buy from the spot market where no contract is required (e.g. transactions take place at livestock trading venues); purchase pigs from brokers without contracts, who in turn buy from individual pig farms (middleman relationship); use contract farming signing production or marketing contracts with pig farmers; buy from cooperatives, and vertically integrate pig farmers to produce pigs at their own base. As the relationship types move from left to right in the figure, they become more vertically integrated, with the spot market being the loosest and vertical integration being the most integrated type. Focal companies may adopt more than one type of relationship with pig farmers simultaneously. In general, focal companies tend not to buy from the spot market due to traceability and quality issues.

3. Challenges in China's pig industry

There are several challenges in China's pig industry, such as food safety concerns, pig/pork price fluctuations, environmental stress and fragmented pig production. Food safety is the first concern. Epidemic diseases have always been a risk for pig farms. During the past 10 years, several epidemic diseases have affected the Sichuan area¹, raising public concern and causing major economic losses among pig producers. Compared

¹ Epidemic diseases occurring frequently in Sichuan area are blue-ear disease and *Streptococcus suis* disease.

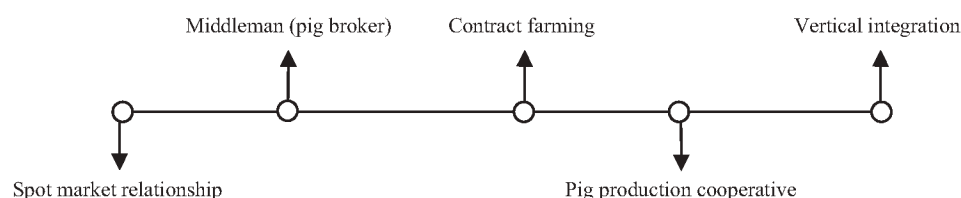


Figure 2. The relationship continuum between pig farmers and pig slaughter/slaughtering companies in China.

with large-scale pig producers, small-scale farmers suffered more due to the limited availability of capital to hedge against the risk. Second, fluctuations in live pig prices pose a serious risk for pig producers in Sichuan, and were particularly significant between 2000 and 2015 (Supplementary Figure S1). Figure 3 shows the price volatility within the year 2014. To illustrate further, in 2015, the average loss of a medium-scale farm was CNY² 300 per pig in the first half of the year, and the average net profit of a medium-scale farm was CNY 200 per pig in the second half of the year.

Third and finally, pig production has created environmental stress, which raises concerns in the central as well as local governments. Traditional pig production farms discharge faeces directly into rivers causing serious water pollution. In Zhejiang province, the government started closing down farms situated near rivers; however, this approach doesn't solve the environmental problems in the long run as it simultaneously decreases pig supply. The government in Sichuan provides policy levers to incentivize large-scale farms and stop subsidizing small and medium-sized ones, which creates another problem for the small-scale pig farmers, who are faced with the decision of whether to produce something else (rearing pigs will therefore cease to be their main business) or become employees on large farms. Neither the pig producers nor the government have yet found an effective way to solve the problem of water pollution.

4. Pig industry in Sichuan and Qionglai

Sichuan Province is located in the southwest of China; its pig production volume ranks first in the country, accounting for more than 15% of total pig production (Figure 4). Qionglai prefecture is a pig production base in this province, also supplying pigs to other areas besides Chengdu, which is the capital of Sichuan province.

² 1 CNY = 0.15 \$USD.

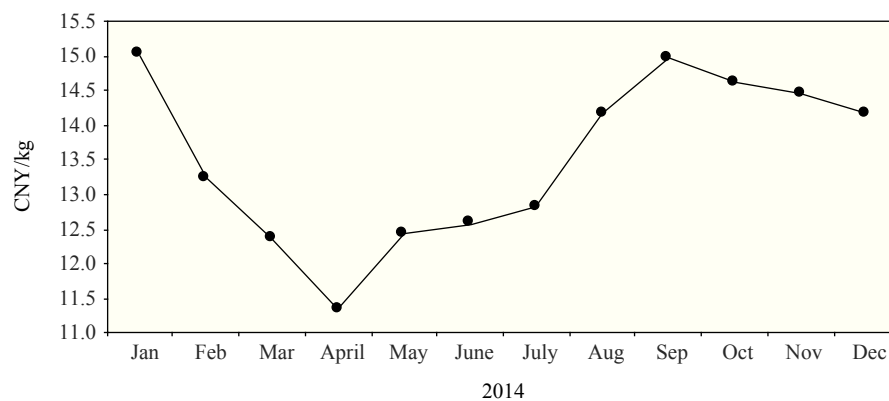


Figure 3. Average price of fattened pigs in Sichuan Province from January to December, 2014 (1 CNY = 0.15 \$USD) (adapted from Livestock Industry Development Bureau in Sichuan, 2016).

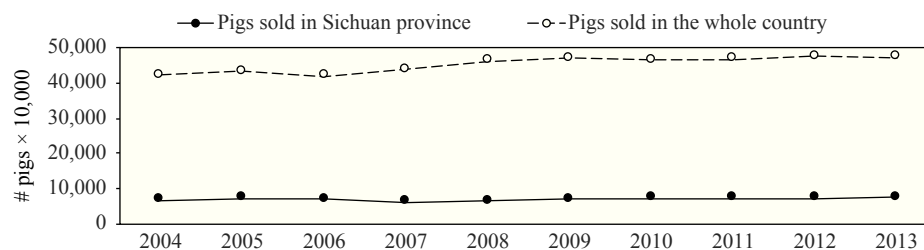


Figure 4. Pigs sold by the end of year in China and in Sichuan Province from 2004-2013 (adapted from China statistical yearbook, 2014).

The pig production volume of Qionglai has been on the rise for the past 10 years (Figure 5). Qionglai city is well-known for its agricultural development, which includes the pig, wine and dairy industries.

Pig production in Qionglai nicely represents the pig production situation in China, which is still dominated by small-scale and backyard pig producers. In the pig industry farms with a production scale smaller than 50 heads of fattened pigs per annum are called backyard farms, between 50 and 100 heads small-scale farms, between 100 and 500 heads medium-scale farms, and more than 500 heads large-scale farms.

In Table 1, we can see that backyard pig production increased from 2014 to 2015 in terms of both numbers of pigs produced and percentage of pigs produced in Qionglai. The main reason is that there are low entry barriers for backyard pig producers. With the big price surge in the second half of 2014, backyard farmers were highly motivated to raise more pigs.

Small-scale and medium-scale pig production scaled down in 2015 compared to 2014, in number of farms, number of pigs produced and percentage of pigs produced. Farms of 100-499 heads have been built historically on the basis of backyard farms, with no standardized and modernized farm facilities. The reason is that the local government does not give financial support to small and medium-size farms anymore, but tends to encourage the development of big farms by giving them financial benefits³. Therefore, although the number of pigs produced increased in 2015 compared to 2014, the number of big farms stays the same but shows a substantial increase in average production capacity.

Table 2 shows the number of pig farms of different scales in Sichuan from 2012 to 2014, and backyard farms dominate pig production in Sichuan province.

³ There are many types of benefits that large farms can get from the government, such as subsidies for enlarging their infrastructure, introducing good breeds, disposing of faeces to prevent pollution, and loan interests, etc.

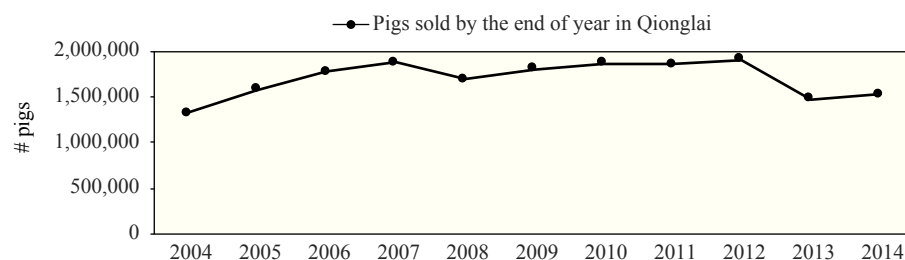


Figure 5. Pigs sold by the end of year in Qionglai from 2004-2014 (adapted from Livestock Industry Development Bureau of Qionglai, 2015).

Table 1. Pig farms and production volume in Qionglai in 2014 and 2015 (adapted from Livestock Bureau of Qionglai, 2015).¹

Scale	Number of farms		Number of pigs produced		Percentage of pigs produced	
	2014	2015	2014	2015	2014	2015
Backyard (<50 heads)	n.a.	n.a.	354,438	416,873	47.25	59.55
Small scale (50-99 heads)	2,069	393	134,973	64,062	18.00	9.15
Medium scale (100-499 heads)	1,038	651	181,413	112,556	24.19	16.08
Large scale (>500 heads)	61	62	79,176	106,509	10.56	15.22
Total	n.a.	n.a.	750,000	700,000	100.00	100.00

¹ n.a. = not available

Table 2. Number of pigs farms of different scales in Sichuan Province from 2012 to 2014 (adapted from China livestock statistics yearbook, 2015).

No. farms per year	No. of animals per farm								
	<50	50-99	100-499	500-999	1000-2,999	3,000-4,999	5,000-9,999	10,000-49,999	>50,000
2014	7,373,861	224,432	57,832	11,651	3,583	715	371	259	4
2013	7,645,726	221,391	55,825	10,753	3,626	720	370	256	4
2012	9,433,336	287,920	64,481	12,401	4,063	810	457	290	6

5. Background of Jinzhong

Jinzhong was founded in 1994 as a small pig slaughtering and processing factory (named Jinli originally) by Mr. Chen Naizhong, and has been a family-owned company and developing fast over the past 20 years. Mr. Chen reshaped the Jinli slaughtering factory into an incorporated company and changed the group name to Jinzhong in 1999. The incumbent president of Jinzhong is Mr. Liu Xiang, a son-in-law of Mr. Chen.

Jinzhong is located in the industrial park of Qionglai prefecture, where many branded food processing companies have established factories, such as Yili Group (one of the Chinese dairy industry giants), Kinliufook or Jinliufu Co. Ltd. (China's top 10 white wine brand), Wenjun (best tea brand in Sichuan Province) among others. Jinzhong now owns a slaughtering line imported from Meat Processing System (MPS)⁴, with a slaughter capacity of 2,000,000 heads annually. It has more than 20,000 tons of frozen pork reserved constantly at a national level for urgent and future use. There are several series/levels of products, which are sold in different channels (Supplementary Table S1 and Supplementary Figure S2). Table 3 shows the key development stages for Jinzhong.

The MPS slaughtering and processing line is considered one of the key competences of Jinzhong as it is a modern and advanced processing technology system providing temperature control⁵ throughout the whole slaughtering process.

Jinzhong is a leading company in the pork sector at a national level⁶ and creates a significant impact on the local economy and sustainable development in terms of employment and poverty alleviation. Its businesses include feed production, breeding, and pig production, pig slaughtering and processing, cold chain logistics (Jinzhong has its own logistics truck fleet) and retailing. Jinzhong's pig supply comes from four channels in 2015 (Figure 6).

More recently, in 2014, Jinzhong started collaborating with ItoYokato supermarket to sell its premium quality pork products. It also aims to make increasing use of Jinzhong's own distribution channels (Jinzhong own branded stores) to distribute high-end pork products in the future. In the next five years starting from 2015, Jinzhong plans to further integrate its supply chain towards downstream.

⁴ MPS Group is a Dutch company that produces and sells meat slaughtering and processing lines (machinery) for 'cold-fresh meat (0-4 °C fresh meat)' internationally. It is a leading company in this industry which offers sophisticated meat processing technology that ensures meat safety.

⁵ Temperature control is extremely important for meat safety because when a pig is freshly slaughtered, its body temperature could reach 40 °C in the slaughter line. If it is not sent to places with a cooling system, microorganisms may reproduce fast, which negatively affects meat safety and quality.

⁶ Jinzhong is included in China's agricultural industry leading companies list.

Table 3. Stages of development of Jinzhong Food Co. Ltd.^{1,2}

Period	Business development milestones
1994	Started as slaughtering and processing factory (named Jinli).
1999-2004	Expanded business of Jinli Co. Ltd. into pig production, established a 1000-head pig (reproducible sows) farm and expanded the slaughter line capacity to 1,000,000 heads. Took the initiative to sell fresh/chilled pork and processed pork products to brand stores (either franchised or self-owned) in Chengdu area.
2005-2009	Group name changed to Jinzhong. Jinli pig production cooperative was established. Self-owned production base is scaled up to 100,000 heads fattened per year. MPS slaughtering line was introduced from the Netherlands. Annual slaughtering capacity reaches 2,000,000 heads. Started to invest more in meat processing and diversification of processed meat products.
2010-2012	Jinlai Feed Co. Ltd. was founded as a subsidiary company of Jinzhong group and has 100,000 tons of feed production capacity annually. Number of brand stores in Chengdu grew up to 200 in 2012.
2012-2016	Penetrated the high-end pork market. Has taken advantage of Chengdu government's project to establish 'Tianfu (paradise) modern agricultural area'. By investing in a new processed food production line and working with ItoYokato, a Japanese high end retailer. Jinzhong vertically integrated the pork supply chain more deeply.

¹ MPS = meat processing system.

² Additional information can be found in Supplementary information S1.

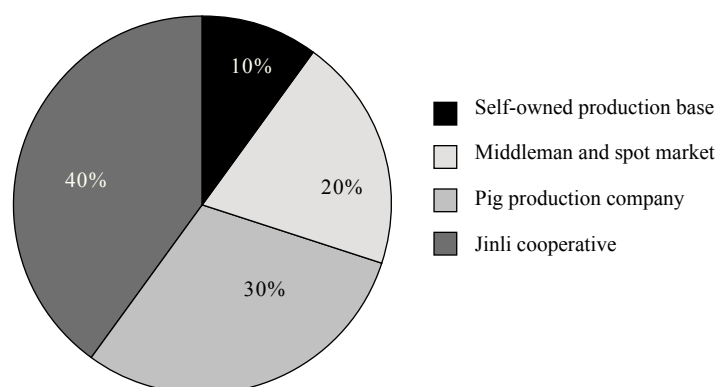


Figure 6. Percentage of pig supply from different channels in 2015 (Jinzhong Food Co. Ltd.: <http://group.jzfoods.cn>).

6. Jinli pig production cooperative

Motives and resources to initiate a company-led cooperative

Before 2005, farmers sold fattened pigs to Jinzhong based on live spot market prices and smallholder farmers were the dominant type of suppliers of Jinzhong. During that time, Jinzhong had to buy from all sources, i.e. backyard farmers, middlemen (who tend to buy from backyard farmers), small and medium as well as large-scale pig farms (Table 4). Contagious *Streptococcus suis* infection⁷ prevailed in Ziyang, Jianyang and Lezhi areas of Sichuan Province in 2005, and it raised major food safety concerns in government, industry and among the public at large. Even rural consumers switched to branded pork products sold in supermarkets rather than the wet market to ensure product safety and quality. Supermarkets have their own quality requirements

⁷ *Streptococcus suis* is a bacterial infection that could affect pigs' meninges and respiratory passage and thus causes septicemia and quick death.

Table 4. Percentage of different scaled farmer members in Jinli in 2005 and 2015.¹

Year	Large scale farmers members (>500 heads) (%)	Small and medium scale farmer members (50-499 heads) (%)	Backyard scale farmer members (<50 heads) (%)
2005	10	30	60
2015	20	50	30

¹ Data supplied by Ms. Tian Bishan, Executive Manager of Jinli cooperative.

as well as cooling systems for pork products that are sold in their stores, while in wet markets, there is no quality standard for pork products and not all the sellers have cooling systems in their stores.

To deal with the vulnerable market, Jinzhong had to think not only about how to stabilize its pig supply, but also how to ensure sourcing of healthy and safe pigs. However, since it started as a pig slaughterhouse and pork processor, Jinzhong had little experience in breeding and fattening pigs. Compared with professional pig production companies (e.g. Wenshi⁸), Jinzhong does not have the advantage of producing pigs on a large scale.

In 2005, Mr. Gou Mingjun, Deputy Director of the livestock bureau in Qionglai discussed the idea of establishing a company-led cooperative with Jinzhong's general manager at the time. It didn't take long for the bureau, Jinzhong and farmers to decide to jointly invest CNY 1,000,000 to start the cooperative. Qionglai government invested CNY 400,000, Jinli Group CNY 400,000 and pig farm members CNY 200,000 based on their production scale (CNY 1 per member for small holders). One million CNY was raised to start an insurance foundation which was primarily used to compensate farmers for their losses due to epidemic diseases. All the operational costs incurred by the cooperative have been covered by Jinzhong. As there was no cooperative law and regulations set up at that time (laws and regulations on cooperatives in China were set up in 2007), Jinli pig production cooperative was registered as a civil society.

Including the director of Jinli Cooperative, who is also the general manager of Jinzhong, Jinli cooperative has six staff members, who are responsible for managing cooperative members, collecting pig industry information, offering and organizing pig production training courses, financial services, and coordinating logistics and the transportation of live pigs. Jinli cooperative coordinates with different departments of Jinzhong company, including Jinlai feed, Jinzhong processing and Jinzhong logistics. Members of Jinli cooperative purchase feed from Jinlai feed, and sell pigs to Jinzhong processing; logistics/transportation is provided by Jinzhong logistics (Supplementary Figure S3). The costs incurred for running Jinli cooperative are the transaction costs in the form of staff time involved, including ex ante cost of farmer/supplier selection, contracting with farmers on behalf of Jinzhong and ex post cost of training provided to farmers, contract fulfilment by the farmers, resolution of conflicts between Jinzhong and farmers and coordination between farmer members and internal departments.

The governance structure of Jinli Cooperative and relationship with members

Jinli's cooperative membership has decreased from 6,000 (in 2007) to 4,000 (in 2012) to 2,000 (in 2015). In the beginning, Jinli cooperative worked with farm members of different scales but predominantly sourced from backyard farmers. Later, it was found that many backyard farmers behaved opportunistically (e.g. didn't raise pigs as required; didn't sell their pigs to Jinli cooperative when they had been fattened – side selling), so Jinli cooperative moved to working with medium- and larger-scale pig farmers. Farmer members are

⁸ Wenshi Food Co. Ltd. is a listed company on the Shenzhen stock market (stock code 300498). Its businesses include poultry farming, pig farming, duck farming and cattle farming as well as feed and veterinary medicine production. It raises pigs in more than 23 provinces in China with a mode called 'collaborating with local farmers'. It uses its technology and services to help local farmers construct pig farming facilities, train them in pig-raising skills and purchases the pigs of the farmers to sell to slaughter companies like Jinzhong or big pig brokers. Its advantage lies in the professional rearing of livestock animals.

distributed in five towns in Qionglai and surrounding areas. Table 4 shows the percentage of different types of farms from which Jinli cooperative sourced live pigs in 2005 and 2015. It can be seen that compared to 2005, the number of large farms doubled (from 10 to 20%); the number of backyard farms halved (from 60 to 30%); and the number of small and medium-sized farms increased from 30 to 50% in 2015.

For cooperative governance, Jinli cooperative set up a member committee, a board of directors, and a board of supervisors. Decisions are not made according to the 'one member one vote' principle, but rather concentrated in Jinzhong's senior management. Farmer members do not have real democratic decision-making power. They have a legal right to exit Jinli cooperative at any time if they notify the cooperative in advance. However, Jinli cooperative also has the right to stop farmers' membership if they have built up a bad credit record during their collaboration⁹.

The relationship between Jinli cooperative and pig farmers is a double-edged sword. On the one hand, both the company and farmers achieve the expected benefits; on the other hand, there are problems such as breach of contract. Although limiting its cooperation with backyard farmers, Jinli cooperative doesn't stop contracting with small farmers, but closely monitors their behavior and develops the small farmers to meet Jinzhong's requirements, by communicating with them, checking their pigs produced by the end of the year and monitoring changes in the number of pigs.

When small-scale pig production becomes medium- or even large-scale, Jinli will change its transactional approach aiming for long-term mutual goals. Therefore, compared with contract farming, buying through the Jinli cooperative means that both the company and the farmers are less concerned about hold-up problems, and transaction costs (monitoring cost) are lower for both sides.

In the Jinli cooperative, members are allowed to purchase feed on credit. Farmers purchase Jinlai feed without paying cash at the moment of transaction, and when they sell pigs to Jinli cooperative, Jinli deducts the feed cost from the payment for the pigs they purchase. This means that if Jinzhong does not fulfil the contract (i.e. does not buy farmers' pigs in poor market conditions), the farmers do not have to pay back the feed cost and the company will suffer a loss.

On the other hand, farmer members need to pay CNY 4.0 per head to the cooperative as a guarantee. If they eventually sell pigs to Jinzhong as stipulated in the contract, they will get this money back; otherwise this is a sunk cost for them.

Jinli cooperative's roles

Mr. Guo Hongxiang, Manager of Public Relations Department of Jinzhong, describes the role of Jinli cooperative as follows: 'Jinzhong endows product quality and safety to its brand value. This is why customers become loyal to our brand. Jinli Cooperative is one of the means to ensure product safety and quality from the origin'.

Ms. Tian Bishan, Executive Manager of Jinli Cooperative provided a similar view: 'Jinli Cooperative serves as a bridge between the company and farmers. It helps farmers in Qionglai region to make more profits from pig production and also trains farmers to produce pigs in a safer and more scientific way'.

Jinli cooperative does not aim to make profits from the transactions with farmers. Instead, it serves as a bridge that connects Jinzhong and pig farmers and is embedded in Jinzhong to coordinate between various departments of Jinzhong and farms (Supplementary Figure S3). When purchasing pigs from farmers, Jinli pays a higher price than the market price.

⁹ According to the definition of International Cooperative Alliance, Jinli cooperative is not a 'real' cooperative as it does not follow the 'one member one vote' principle.

In summary, Jinli cooperative assumes multiple roles benefiting both Jinzhong company and member farmers:

- Provides information and training to farmers including best practices in pig production like disease prevention and cure. It also trains farmers to raise pigs in a modern way using information technologies (e.g. ear tags to record pig production information) applicable to pig production.
- Acts as an information channel between Jinzhong and farmers and between farmers. For example, through Jinli, farmers' problems and requests can be effectively passed on to Jinzhong.
- Plays an important role in building a long-term relationship between Jinzhong and farmers and makes both parties commit to the relationship to achieve mutual benefits.
- Offers vaccination and veterinarian services at a low price. Jinli cooperative has a vet station, which provides free professional veterinary consulting services to member farmers and only charges farmers for the drugs or vaccinations they use.
- Coordinates and provides free transportation to the farmers through Jinzhong logistics.
- Provides discounted Jinlai pig feed, which is well formulated and cheaper than feeds of similar quality on the market. Farmers do however have the choice to use other branded feed (such as Tongwei). In order to encourage pig farmers to use Jinlai feeds, Jinli cooperative recently allowed medium-scale pig producers (100-500 heads) with no membership (non-formal member farmers) to integrate with existing members to enjoy the benefits of Jinlai feed (Figure 7).
- Is responsible for negotiating contract prices with Jinzhong on behalf of its members to get a guaranteed price and higher profits for members. Based on the market price, a fixed protective price has been contracted between member farmers and Jinli. When the market price¹⁰ is lower than the contracted price, then the contracted price is applied; otherwise the market price is applied. In this scenario, Jinli purchases pigs from farmers at CNY 0.1-0.5 per kg higher than the market price. In this way, farmers can make more profits than selling to the spot market. Jinli cooperative gives member farmers returns in two ways. The first is to purchase farmers' pigs with a protective price; the other is to give a bonus to farmers of CNY 5 per head sold to the cooperative. Farmers who raise more than 1000 heads annually will get an extra CNY 0.5 per head and farmers who raise more than 2,000 heads will get an extra CNY 1 per head. Jinzhong pays all the returns given to the farmers through Jinli cooperative.

¹⁰ Market price refers to the live pig average price of Qionglai at the transaction time point between farmers and the cooperative. The cooperative will let the farmers know the average price of the market published by livestock bureau every day.

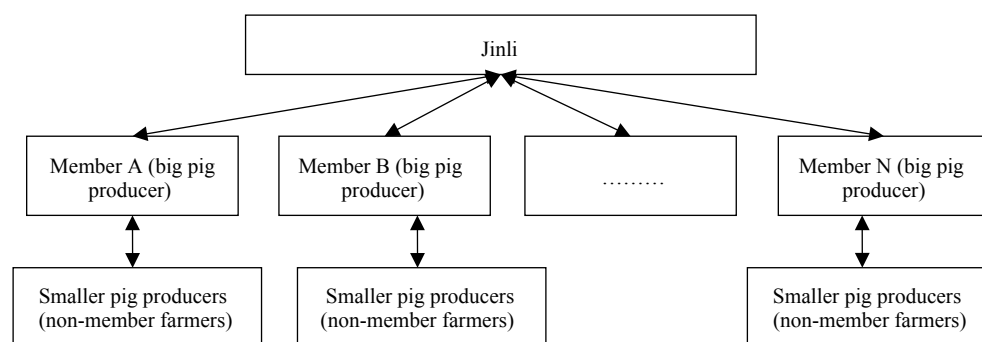


Figure 7. Jinli's federation cooperative model.

7. Benefits for Jinzhong brought by Jinli cooperative

Stabilizes pig supply and ensures pig safety

From 2005 to 2015, the percentage of Jinzhong's pig supply through Jinli cooperative increased from 10 to 40% (Figure 8). In the last ten years, Jinli has built stable relationships with its members, who are used to working with Jinli and selling pigs to Jinzhong, thereby ensuring Jinzhong's pig supply. Compared with 2005, Jinzhong purchased fewer live pigs through the free market, which means Jinzhong is affected less by supply uncertainty and suppliers' opportunistic behavior. At the same time, Jinzhong has increased its own pig production base scale (from 10,000 heads in 2004 to 100,000 heads in 2014) and has assured food safety through better quality control.

This again contributes to the stabilization of pig supply. In addition, with its own production base experience and the cooperative production volume on the rise, Jinzhong is more knowledgeable about pig production processes and is better able to control food safety. There have never been any major food safety incidents in the Jinzhong pork supply chain. With consistent quality control and better brand management, Jinzhong has successfully linked premium quality and safe products with its brand image, which leads to better customer loyalty.

8. Jinzhong looks forward

As commented by Ms. Tian Bishan, who is the leader of Jinli cooperative: 'though Jinli cooperative has helped to stabilize pig supply, farmers are not obligated to sell pigs to Jinzhong. Pig purchasing prices are very unstable. When the market for live pigs improves (for example, in the second half of 2015), farmers tend to sell pigs to pig brokers because they may offer a higher price than Jinzhong. At the moment, it's even easier for Jinzhong to purchase pigs from pig production companies such as Wenshi, since these kinds of transactions are simple and hassle-free. So, we are not sure whether we should work out a new mechanism to deal with the local farmers as members of Jinli cooperative or simply move to sourcing pigs more from other channels'.

It is therefore a key decision for the senior management of Jinzhong to make on whether to keep the Jinli cooperative or move to other types of supplier governance.

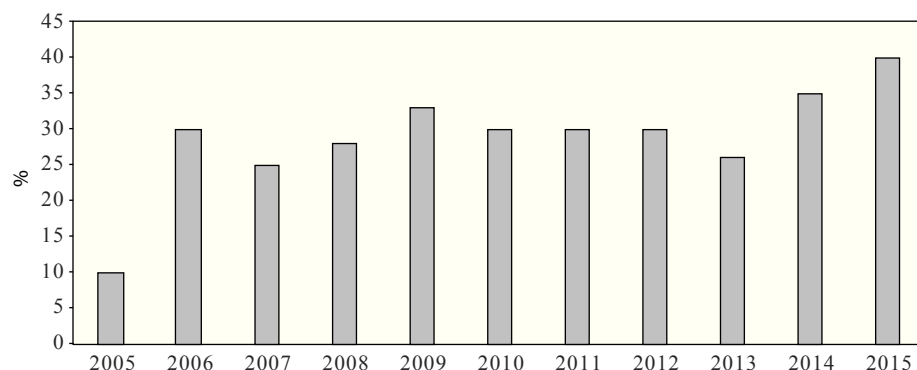


Figure 8. Pig supply from Jinli cooperative to Jizhong (2005 to 2015).

Supplementary material

Supplementary material can be found online at <https://doi.org/10.22434/IFAMR2016.0101>.

Figure S1. Average live pig prices in Sichuan Province from 2000 to 2015.

Figure S2. Jinzhong Product series and example pictures.

Figure S3. Jinli cooperative's functions and its relationship with other departments at Jinzhong.

Table S1. Jinzhong product ranges and examples, and their distribution channels.

Supplementary information S1. Financial performance of Jinzhong.

Teaching note

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