China's Dairy United: Organization, Governance, and Safety

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"I have a dream, that every Chinese, especially children, could have 500 grams of dairy products every day."

Former Premier Wen Jiabao, April 2006

Help more Chinese people drink the high-quality milk every day!

The Mission of Dairy United

Traditionally, China was a milk-poor country, and only babies, the sick, and the elderly drank milk. When China began to reform its economy in the late 1970s, annual milk production was just under 2 billion lbs., less than 2% of America's 122 billion lbs. When a consumer enters a Chinese restaurant and browse the menu even today, he/she immediately notice an important difference between Chinese and American food: there is virtually no dairy among the ingredients. Milk and other dairy products such as cream and cheese are not part of the traditional Chinese diet, which mainly includes cereal grains, vegetables, soybean products, and small amounts of egg or meat. Thirty years later, a Chinese milk scandal—milk and infant powder tainted by melamine, a nitrogen-rich industrial chemical—shocked the international dairy sector in 2008. Even as many dairy companies faced huge losses or risked bankruptcy during the industry's reshuffle, one small dairy company accelerated its development. It is the Dairy United.

Dairy United: Fight as an Underdog

The Inner Mongolia Dairy United Sci-Tech Co., Ltd. (Dairy United) is one of the fastest growing and most innovative milk producers in China. It is headquartered in Hohhot, Inner Mongolia, a region known internationally as China's dairy capital since it produces over one-fourth of China's milk. Dairy United is a strategic raw milk supplier for the Yili Group, the second largest processor and manufacturer of milk products in China. Dairy United was one of the few Chinese milk producers or processors with no melamine detected in its products during the 2008 Chinese milk scandal. Since its establishment in 2007, Dairy United has grown from zero dairy cows (and zero ranches) and $3.7 million of registered capital to more than 10,000 dairy cows and 15 ranches with $14.4 million of registered capital in 2012.

The key to understanding Dairy United's success is its unusual organizational structure, which allowed it grow to a main player. Because of the restricted access to loan financing from domestic national banks or to equity financing, this company adopted a business model distinct from both a cooperative and a modern corporate farm. Dairy United ingeniously uses a leasing contract to obtain dairy cows. After signing contracts with small and scattered dairy farmers, Dairy United raises farmers' cows with modern facilities, technologies, and managerial methods. In return, farmers receive fixed biannual returns, but relinquish control, cash flow and residual-claimant rights to Dairy United. This arrangement allows the company to procure dairy herds without making lump-sum investments.

Dairy United also illustrates an unusual model for an industry transitioning from dispersed, small-scale production to larger-scale, capital-intensive methods. Organizational innovation stems from Zhaolin Li (CEO and cofounder) and his startup team. Dairy United was Zhaolin's third business venture, and he started it with only $3.7 million, a modest sum—able to cover the expenses of 100 head dairy cows and a ranch—given the specifics of the dairy industry. Zhaolin had prior professional experience in IT service and agricultural-technology (Ag-tech) marketing, but he had never imagined running a dairy company. He had not seen a dairy cow before his visit to Beijing Sanyuan Dairy in 2001. Recalling that moment, Zhaolin has said, "At first sight, I felt a special bond with the cute heifer." This was his second time to start a new business in a totally unfamiliar field. As before, when encountering a career ceiling, he challenged himself by engaging in something new, inspiring and meaningful.

The leasing contract, at the heart of the business model that leads to Dairy United's phenomenal growth, is unusual and interesting. But Zhaolin and his startup team continue to wonder: is it an optimal organizational structure in line with the company's core competency? Is it reproducible if the company may expand in other regions in China? In order to address these questions, we need to study Dairy United's history, and find out why the company chose a leasing contract with a fixed price, rather than a sharecropping contract which would have enabled dairy farmers and the company to share the risks in milk production, a US-style cooperative which is the dominant governance structure in the dairy industry, or a corporate farm such as Modern Farming Group which buys all dairy cows on the market.

Background: The Booming Chinese Dairy Industry

The development of Dairy United coincides with the growth of the Chinese dairy sector and the increased purchasing power of the Chinese consumers. The dairy business took off following a 2001 report from China's Ministry of Agriculture, "Acceleration of the Development of Animal Husbandry Industry," along new policies designed to encourage milk production. In 2012, China ranked among the world's top three milk producers while per-capita fluid milk consumption was just 20 kg. in urban areas, and less than 4 kg. in rural areas (see Figure 1).

The upsurge of milk production largely reflects an increase in cow inventory rather than productivity growth (Wattiaux et al. 2002). From 2001 to 2004, dairy cow inventory doubled from 5.66 to 11.09 million head, while it had taken 12 years to double from 2.69 million head in 1990 to the 2001 level (see Figure 1). The quantity of imported dairy cows originating from New Zealand and Australia more than doubled every year—11,400, 50,000, and 132,400 in 2002, 2003, and 2004—after a sharp increase from 600 head in 2001. The number and value of imports of embryos and frozen bovine semen imports also shot up. Similarly, the number of dairy processors with annual sales above $800,000 has increased by 15.12%, 14.98%, and 17.03% in 2001, 2002, and 2003.

(Insert Figure 1 here)

The vast expansion in scale only slightly affected the industry structure, and the whole industry suffered from diseconomies of scale and potential safety hazards. First, scattered backyard production operations continued to account for more than 80% of output in 2007—the shares of farms with greater than 100 head of dairy cows in each of four classes being less than 5% in both 2002 and 2007 (see Figure 2). Second, as with other produce production, it is difficult to tie specific inputs or persons' efforts to the outcome,

either milk quality or quantity. But quality control can be achieved by specifying steps to be followed and monitoring the whole milk production process (Sykuta and Parcell, 2003). The problem is that most Chinese dairy farmers rushed in the dairy sector after 2001, and they were inexperienced in rearing cows (Dobson, Dong, and Jesse, 2011). Professional training and other supportive services are also very limited. Content with the traditional ways of raising pigs, Chinese farmers have been unwilling to adopt high-cost but feed-efficient methods and sanitation procedures to guarantee the safety of milk.

(Insert Figure 2 here)

Backyard production requires a particular system for milk collection. To expand aggressively in low-cost, high-return processing and marketing, more and more milk processors have divested themselves of self-built branches, which needed substantial operational expenditures and generated low returns. Among milk production, processing, and retail, the input-cost ratio is 7.5 to 1.5 to 1; while income ratio is 1 to 3.5 to 5.5 (Liu, 2012). For example, the price of 1 kg. formula milk powder is $45. The milk producer, processor, and retailor reap $5, $15, and $25, respectively. However, for daily capacity of 1000 metric tons of milk, milk processor must invest $50 million, but the milk producer must invest 10 times more. Milk processers have also outsourced milk collection centers, the last step for monitoring safety and quality, as these are expensive to build and maintain. Milk processors paid a heavy price for giving up process control of safety by owning less and less ranches and outcome quality control by outsourcing milk collection center.

Recognizing these fundamental factors, Zhaolin and Zhenghong (Director, and Zhaolin's classmate) cofounded Dairy United, aiming to improve dairy quality by training local

farmers and providing them with service, rather than rushing into dairy processing or marketing. To address the milk quality issue, what is the first big hurdle that Dairy United needed to jump—farmer's inexperience, the complexity of milk production, or the industry uncertainty?

Dairy United's Foundation, Transformation, and Growth

The development of Dairy United is an interesting and inspiring story. It gives insight into how entrepreneurs achieve success in China's unique business environment: who becomes an entrepreneur, how entrepreneurs act in a dynamic economy, how they overcome financial or institutional constraints, how they identify market niche and achieve success even by using a technique such as leasing that is common in developed countries.

Zhenghong strongly sensed that the dairy sector was changing when he conducted an irrigation project in Inner Mongolia during 2000-02. Possibly it was due to the fact that he noticed more dairy cows wandering in the prairie. Optimistic about the future of the dairy industry, he chose Zhaolin as his partner in the light of the traditional Chinese maxim that considers the ideal business partner to be either one's classmate or military companion. The two had known each other since 1990, when they studied at China Agricultural University, the top Chinese university in agriculture and animal science.

Creating a new venture was terrific timing for Zhaolin, who ran a very profitable Ag-tech firm but was running into a career ceiling. He became acquainted with this new technology (a lab project) via Zhenghong's recommendation, so he had very positive experience from the collaboration. Before establishing this Ag-tech firm in 1997, Zhaolin

was a senior manager at a Hong Kong investment firm at Zhong Guancun, the Chinese Silicon Valley. But he had an ambition to popularize this lab finding on lodging resistance of winter wheat, thus quitting his job—he earned after five years of working as a salesman. Applying his marketing and IT experience, Zhaolin brought the lab project to market, promoting it from an incubator to a promising firm with more than $3 million annual income in 2000. After imparting his specific skills to the marketing team, he hoped to continually challenge himself with a new venture.

Unsuccessful Startup

This, the beginning of Dairy United, under the name Plus Agriculture (Inner Mongolia Plus Agriculture Technology Co., Ltd), came in June 2004 after months of domestic and foreign surveys on dairy cooperative and technical assistance companies. At first, the main business was not raising dairy cows at all. Rather, the founders aimed at providing dairy farmers with technology services and support, including animal husbandry, improved genetics, and veterinary medicine. They chose a service model for two reasons. First, ideally, it combined Zhaolin's professional experience in IT with education in agriculture, greatly lowering the uncertainty of huge investment. Second, not much money was available because debt financing is hard to access for small business in China, requiring not only collateral, but also the need to develop good relationships with national banks. Therefore, they had to adopt this low-cost operating model, as a deliberate business plan.

Unfortunately, the success of Dairy United was less than expected. Dairy farmers participated in free training sessions and seminars conducted by professionals from highly regarded Chinese universities and foreign dairy companies. However, they refused

to purchase recommended goods and services, such as buying high-quality frozen bovine semen for an extra charge of $2 (with 10% higher price). Besides, famers indicated that it was troublesome to follow the technical guidelines on raising and milking. Without a stable cash flow, Dairy United could not realize other goals such as improving milk quality and quantity, and guaranteeing safety; hence, after this unsuccessful startup period, it was forced to transform.

Transformation and Growth

The question is how, given limited funding and the capital-intensive nature of the dairy industry. Total assets only covers the expenses of 100 head dairy cow and a ranch, and a large scale of milk production was seemingly unaffordable, but Zhaolin was determined to raise dairy cows—to become a real player. In late 2006, the company's name was changed into Dairy United to convey the idea of working together with farmers.

Dairy United has achieved its success in 2007. "Chinese farmers are not good at raising dairy cows, and Dairy United helps them go back to what they are good at," Zhaolin said. Leasing is the key concept. Leasing is common in many Chinese industries, but no one had thought to lease animals, rather than equipment, and to have the lessee raise and maintain the animals. Dairy farmers were also willing to let their dairy cows "join in" Dairy United, especially after the 2008 Chinese milk scandal. Approximately half of the milk collection centers and milking halls went out of business, and many small dairy farmers no longer had access to the market. In Tumed Left Banner, where most of Dairy United's ranches are located, the situation was even worse. There were around 4760 milking halls, plummeting to less than 100 after the milk scandal. More than 200 dairy

cows “joined in” Dairy United in one month during the peak period. With more and more dairy cows on hand, Dairy United grew faster.

Dairy United continually overcame financing hurdles for small-and-medium enterprises in China by raising foreign debt, attracting venture capital, engaging in joint ventures, taking advantage of government subsidies, and issuing small-enterprise bonds. Major expansion began by borrowing €4.98 million from an investment bank of North Europe in 2007. It has received $30 million in venture capital from Shenzhen Capital Group Co., Ltd. in 2010 after Zhaolin met its CEO at a private equity program. Dairy United also collaborated with Yili Group in building 20 dairy farms since 2011, with Yili Group building 20 dairy farms and renting them to Dairy United, which installed the necessary equipment. It further issued $250 million bonds for small and medium-sized enterprise in 2013. All of these activities have helped Dairy United accelerate its expansion, while, for 2015, it plan to have 50 ranches with about 100,000 dairy cows.

Dairy United’s Business Model: Leasing

Zhaolin contemplated how to obtain dairy cows at a low cost. With only around $3.7 million on hand, he was far from feeling any relief.

Why Lease Cows, Rather than Other Options

There are four options available for him (see Table 1). This budget constraint was the main hurdle to adopting the corporate farm model. He could use up all the money to buy 100 head dairy cows head and to build a ranch, but the scale was too small to exert an impact on the whole dairy sector. The second option was to organize a dairy cooperative, the dominant governance structure in developed countries, in which the risk and benefits

are well aligned. However, Chinese dairy farmers did not master in raising cows, which was also the primary reason that the service-oriented startup failed.

Zhaolin noticed an opportunity in the plight of the dairy sector during 2006, which was caused by surging costs of heifers, and corn and other forage. In 2006-07, growth in dairy sector faltered. The price of a high-quality dairy cow like a Holstein tripled, rising from about $700 to $2,000. Also, a buoyant ethanol sector drove corn prices up by 24.2% compared to 2005. However, the price of raw milk kept flat, roughly keeping at $300/ton (metric) since 2000. In certain areas, the forage cost increased by 30-40%, which forced dairy farmers to sell or even kill dairy cows for beef to cut losses, driving the number of dairy cows down by about 1.5 million head (see Figure 1).

Why not negotiate with dairy farmers, and make arrangements to raise their cows at Dairy United? It sounded like a promising and win-win solution. Dairy farmers were eager to reduce their losses, and Dairy United sought low cost way of obtaining cows. The third solution was to make dairy farmers shareholders. Based on the total value of their cows, they could claim a certain share of the firm's value, tantamount to holding stock. Yet, the problem was that it was costly, if not prohibitive, to allow many small farmers to take part in decision making. At the same time, farmers did not want to bear the downside risk. The last option was leasing dairy cows from farmers, like a form of debt financing. In contrast to the third option, Dairy United needed to make more out-of-pocket payments. Dairy farmers would receive fixed payments without bearing the risk of losses, which seemed reasonable to the dairy farmers.

(Insert Table 1 here)

Zhaolin preferred the last option because he foresaw the troubles of having farmers participate in decision making, especially after failing to persuade them to adopt modern technology. He might have been ignorant of the business model's difficulty in theory—the leasing option can be interpreted as a form of making the agent the residual claimant, like corporate management buyouts (MBOs), to align interests of principal and agent (Stiglitz, 1974). But Zhaolin found the option very tough in practice. It is no exaggeration to say that farmers regarded their dairy cows as important as their own life or that of their kids, and it was nearly impossible to assure them that other people could take better care of their cows. Zhaolin and his team spent countless days and nights in explaining contractual arrangements at dairy farmers' houses, showing them how much they earn by raising cows themselves and comparing that figure with contracting with Dairy United. After a big dairy farmer with more than 10 cows decided it was beneficial, other farmers began to follow his lead.

The Contract Value of a Dairy Cow: Pricing

A dairy cow's contract value combines market information with the cow's physical indictors, such as health, age, breed, and output. The contract period is three or five years, depending on negotiation and the cow's age. Taking a Holstein with 4,500 kg. annual milk production for example, it was worth $900 on the spot market in 2006-07. If the farmer raised it by himself, annual net profit would be around $200. If the farmer signed a contract with Dairy United, he not only would obtain a premium higher than his profit, say, $250 every year, but also got his $900 principal back after three year.

Therefore, the contract value of the dairy cow was $1650, and the dairy farmer received six biannual payments of $275. Dairy United called the $750 above market price total

"dividend" the farmer would be received in three years, and called farmers "shareholders." The new terminology in the contract caused much misunderstanding of the nature of Dairy United among scholars and the public (see Table 2). Especially, the media gave it extensive and good coverage, and it was described as an innovative cooperative, even though it was not a cooperative at all. Another source of this confusion came from the company's name, Nailian She, which has a similar literal translation to that of the word for cooperative (Hezuo She), collaborating with farmers. All these subtle, but important, issues set barriers for Western scholars and practitioners to thoroughly understand businesses conducted in China.

The Structure of the Leasing Contract

Dairy United signed personalized leasing contracts with dairy farmers that were not raw milk sales contracts or equity contracts. Within the contract period, cows were raised at the company's farms, and farmers had the right to be informed of their cows' health even though it was unnecessary due to their payments are fixed. For example, if a cow was valued at $1,650 as above, a three-year contract would include the following items. (We attach the contract as a supplementary material.)

- Dairy cows are raised at Dairy United, which is in charge of raising cows and bears the costs, including cows' disease or death, and the uncertainty corresponding to market-price fluctuations. Also, Dairy United will retain all incomes from selling raw milk and the ownership of new-born heifer.
- Farmers receive fixed payment biannually. In this case, dairy farmer will receive his first $275 six months after the date the contract is signed.

- Dairy farmers' payments are not influenced by Dairy United's profits or losses, but only by initial contract value. Farmers do not have rights to claim dividends or participate in decision making for the firm's daily operations or development strategy.
- After three years, there is no further relationship between farmers and Dairy United. The firm owns the dairy cows.

(Insert Table 2 here)

Dairy United's model succeeded, at least in the short run, in helping the consolidation of the Chinese dairy sector. By the end of 2012, Dairy United had about 10,000 dairy cows in stock and 15 ranches in operation, which led to $15 million in sales revenue and increased registered capital to $14.4 million. In the meanwhile of enjoying these achievements, Zhaolin often recalled the days and nights in farmers' houses: why it was so tough to persuade dairy farmers?

Mutual Benefits for Farmers and Dairy United

Dairy farmers ostensibly gave up their long-run interests in exchange for short-run benefits since they no longer engaged in rearing cows and owning new-born heifers. The fact is that participants mutually benefit from voluntary market exchange.

For Farmers

Dairy farmers' long-run welfare was improved if one looks at the big picture, beyond this contract. For example, farmers could grow specialized corn for Dairy United to make silage, which created $150-300 extra income per acre for farmers than in growing ordinary corns in one year. Also, Dairy United bought mechanized corn pickers and other instruments to help with harvesting, which would otherwise have been handled manually, thereby saving the cost of at least employment of one worker per family. Dairy farmers were also able to earn around $2,000 per year by working at Dairy United or migrating to work at other places.

For Dairy United

Dairy United has definitely benefited greatly, even though it provided dairy farmers with a big chunk of the price premium. First, Dairy United's profit margin was higher than local farmers' and the domestic average level. The company elevated dairy cows' value—with milk production rising by 33% (from 4,500 kg. to 6,000 kg.)—by adopting modern practices, yet there was still a gap between Dairy United and the top Chinese milk producer (above 9,300 kg. in Sanyuan Dairy). Besides, forage costs savings amount to $60-$90 dollars per cow due to economies of scale, while raw milk gained $0.13/kg.-$0.16/kg.as a price premium by meeting international quality standards. Second, if the time value of money is considered, above mentioned contract value ($1650) is not that much. For 10% (or 20%) annual interest rate, the discounted present value of $275 biannually for three years is $1,396 (or $1198). Third, dairy cows not only produced cash flow as another leasing asset, but also gave birth to heifers every year, which hugely differed from other inanimate capital. Finally, Dairy United overcame the start-up barrier under strict financing constraints for small business, and stepped onto a rapid development road.

Milk quality and quantity have been considerably improved, as too has the overall health of the dairy cow, which is the mission of Dairy United and Zhaolin's aspiration. For instance, the protein percentage is more than 3.2, the fat percentage is more than 3.8, and the total solids percentage is more than 12.4. The somatic cell counts (1,000 CFU/ml) are less than 20. For the first three indictors, the bigger they are, the better the milk quality is. For the last one, it is just the opposite. All these indicators meet the domestic and even EU standards. The threshold of Chinese standards is 2.8, 3.1, 11.2, and 200 for four indictors above. In contrast, the protein percentage from the milk produced by dairy

farmers is between 2.9 and 2.95. It is a huge difference that the protein content increases from 2.9% to 3.2%, rising by more than 10%. The lower protein content is also the reason that melamine, a nitrogen-rich chemical, is added into milk to pass quality sampling inspection.

For Chinese Dairy Sector

Milk production requires other supporting institutions and services, from various types of forage, machinery and equipment to training. Huge numbers of managerial works are needed if these services are not provided by the market. Regardless of managerial works, dairy cows that "join in" Dairy United are still a small part of total cow inventory in Hohhot. Zhaolin realizes only one firm cannot undertake all these functions in helping other dairy farmers. With the development of Dairy United, it has also trained many professionals in production, management, and other areas. Sixteen new firms or cooperatives have been founded with the help of employees from Dairy United. Most of these new firms focus on forage production, processing, and equipment maintenance, and not only provide forages to Dairy United, but also to other large dairy firms such as Modern Farming and Yili Group.

Dairy production is a low-return link in the supply chain of dairy products, which drives Dairy United's decision to diversify its business in milk processing in 2015. Meanwhile, under the influence of Dairy United and the incentive of the price premium, especially big dairy farmers, who did not join the Dairy United, are more receptive of modern farming now. Dairy United also considers new ways to cooperate with these farmers by providing technology and service as initially planned or by organizing regional

cooperatives. In summary, Dairy United progresses toward the mission of changing Chinese dairy sector and helping more Chinese people drink high-quality milk every day.

Challenges and Opportunities

Although Dairy United is expanding rapidly, and is on the path to becoming an influential player in the Chinese dairy sector, Zhaolin and his team face many ongoing challenges:

i. Why did the first startup fail and the transformation succeed? Was leasing the right business model, given the circumstances? What lessons can they draw from the startup experience that will help them in their growth and development phases? Will their model be copied by other dairy producers?

ii. As Dairy United acquires more equity capital, should it stick with this unusual form of debt? Is the firm's business model temporary, a step in the transition toward a more conventional corporate or a cooperative structure, or is it sustainable? How does the leasing model compare to other governance choices in the long run?

iii. Can Dairy United's business model work in other regions of China, or around the world? What other aspects of the case, such as the founders' educational background, diverse professional experience, social networks, and the unique circumstances in China in the 2000s, are key to the firm's success?

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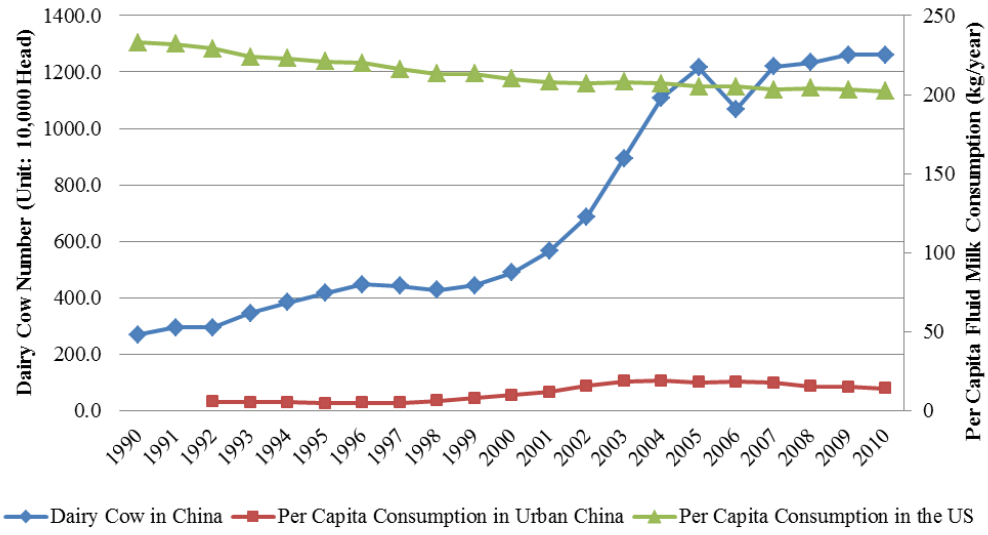

Figure 1: Dairy Cows and Fluid Milk Consumption, 1990-2010

Data Sources: China Dairy Yearbook 2011 (Liu, 2012)

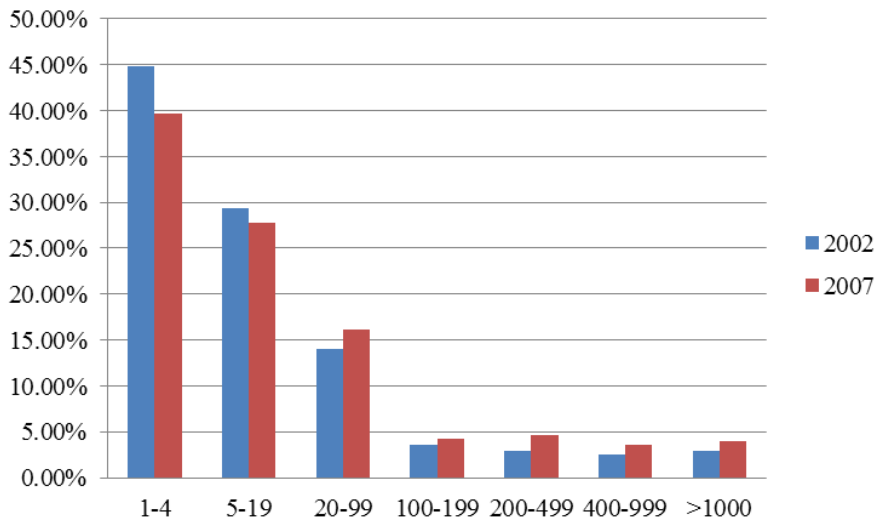

Figure 2: Dairy Cows Shares across Different Scale Ranges

Source: China Dairy Yearbook (2003, 2008).

Table 1 Four Governance Options' Advantages and Disadvantage

Options	Advantage	Disadvantage
Corporate Farm	There is no transaction cost with individual farmers.	The scale is too small.
Cooperative	Well-aligned cost and benefit in the milk supply chain	Farmers do not have the required skills in raising cows.
Farmers Being Shareholders	Less investment; no need to disburse payments to farmers	Collective decision making is costly.
Farmers Being Lessors	Efficient decision making	The firm needs to pay farmers to buy out the cows.

Table 2 Comparison between Dairy United and a Cooperative

	Dairy United	A Dairy Cooperative
Governance	• Investors own and control	• Farmers own and control
Cow Ownership	• Farmers transfer ownership to the firm, which raises the cows	• Farmers own dairy cows, and raise them at their farms
Decision Making	• Voting is based on investment	• One person, one vote
Farmers' Role	• Contractor or lessor	• Owner or shareholder
Risk for Farmers	• Fixed payment; only contractual default risks	• Flexible income; bear operational uncertainty
Profit Distribution	• Divided among investors based on investment	• Divided among farmers based on patronage