

# Critical Impact of Latest Quality Issues and China Dairy Market Economic Overview: Comparative Analysis

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## Abstract

Although general Chinese economy now is growing fast and takes leading positions in the world, its dairy industry comes across several difficulties. It sustained a number of losses after a series of well-known incidents involving food safety. It is certain that paramount mission of the current market conditions requires extensive studies of critical impact caused. The situation with different dairy products varies, and that's why the author describes in details the milk, cheese, and yoghurt markets. Also it is compared to the markets of Western Europe, Russia, India, New Zealand, Australia, America and Canada. This work attempts to analyze contemporary market situation in a retrospective contemplation of the corresponding dynamics and course of economic and public events, including basic trends, business analytics and adjacent studies in an endeavor to discover and situate a better economic mechanism for the given field. The most considerable result is development of economic and business recommendation that are bound to improve the problematic situation.

**Keywords:** China, dairy industry, market comparative analysis, quality issues, loss estimation, safety measures and standards, critical impact

## 1. Introduction

China currently has one of the largest economies, its sustained rapid growth drives it to the 2nd place in the world measured by major indexes such as purchasing power parity, nominal GDP and growing pace (CAGR and other relative methods) (Report, 2013). Since the very moment this country fully joined the world's open market, it started intensively develop all kinds of industries and dairy was no exception from that.

Most of domestic dairy products in China originate from ten provinces that provide roughly 70% of dairy output: Inner Mongolia, Heilongjiang, Henan, Shaanxi, Shandong, Hebei, Jiangsu, Sichuan, Liaoning and Anhui. In a pursuit to increase national dairy production, the government has aggregated these provinces into five dairy regions based on their local conditions and opportunities.

Northeast and Northern areas target to develop milk powder production, cheese, butter and UHT milk; mainly this production is planned to be carried out from large private farms. Western area is designated to production of local specialties such as donkey, goat, yak and camel milk that is not accessible regularly elsewhere in China. Southern region is going to provide pasteurized milk, cheese and yoghurt, as well as protein powder. Large-city surrounding regions, though being geographically separated (Shanghai, Beijing, Chongqing etc), tend to produce pasteurized milk and yoghurt as long as these products are easier to produce in the given conditions (Woolsey, 2010).

Currently the course of dairy industry in China (as well as government politics in this field) is related to increase its outputs up to 48-55 million tons by doubling number of cows and increasing yield per animal (KKR's, 2013). This task is planned to be carried out through increase of cow farms; according to median data, the estimated increase is supposed to be at average 30% higher than today's numbers.

After a number of dairy-related scandals, a lot people in China seem to lose trust in local products, resulting in increased consumption of imported milk, cheese and yoghurt. Dropped revenues made Chinese domestic producers raise prices to the level of imported products.

This was followed by government introduction of tougher regulations on import of dairy products (Wang, 2013).

Foreign producers were given a one-year grace period from the moment of introduction to maintain necessary measures and comply with new standards. However, some sources state that detailed registration procedures and formalities were not released in a timely manner, and currently there is no sustainable information available on the quantity of firms and enterprises that eventually complied.

The history of Chinese dairy standards evolution since early 2000s includes a number of measures, all having direct economic effects to the industry. Originally China implied dairy safety as a set of regulations according to worldwide practice based on relatively strict national-wide standards (GB/T) for main products, as well as less strict regulations for enterprises and firms developing novel foods (QT) (Zheng, 2009).

Following the infamous melamine milk problem of 2008, the government had to loosen standards in June 2010 in regard of protein content and quantity of bacteria in material, since most producers were not able to comply with such regulations. For instance, demands for bacteria development in material was lifted from  $5 \times 10^5$  / 1 ml which was already quite loose in comparison to European and American standards ( $1 \times 10^5$  to  $2 \times 10^6$ ). Demands for protein content (2.95 g / 100 g raw milk) were loosened to 2.8 g / 100 g (3.0 g / 100 g in overseas practice) (Chi, 2012)

Shortly after that, in July 2010 another serious issue emerged. Infant formula originated from Qingdao Synutra International Inc. was deemed responsible for sexual precocity in children, following official announcements, explanations and apologies from the given corporation; in spite of no direct responsibility proof according to sanitary inspection conclusions, the incident caused very significant market losses for Qingdao Synutra International Inc. causing a drastic drop from almost 25 to 10 points and further recession up to 5 points from which the corporation has not healed yet by now with current price for basic share at \$0.54 (figure 1).



Figure 1. Qingdao Synutra International Inc. 5-years stocks dynamics

A very similar economic effect occurred to Yashili International Holdings Ltd. in August 2010. The inner circles of this corporation released information that some of melamine-related milk from 2008 case was not completely taken away from the market and eventually emerged in their products. The company denied any involvement into the case, following an official confirmation by the government. Nevertheless, a substantial market loss was inevitable (figure 2).

The corporation managed to preserve customers' trust and regained market shares in a five-year time span. It involved doubling of deferred tax assets in 2011 from 3.3 to 6.8 million Yuan and reconciling current liabilities (from 158.5 to 31.3 million Yuan in loans and borrowings). Along with increased foreign investment (namely Temasek Holdings, Singapore), the described measures ensured a stable growth.

There were other incidents involving multiple smaller enterprises; for example, it relates to regular inspections, discovering producers from Shangdong, Shaanxi, Hebei and Zhejiang provinces using hydrolyzed leather protein addition to milk for better measurements, such as Chenyuan Dairy Company in Jinhua, 2009.

The General Administration of Quality Supervision, Inspection and Quarantine marked the chemicals used for hydrolysis, sodium and potassium dichromate and hexavalent chromium as causing cancer in a long-term perspective. Certainly, this kind of announcements resulted in severe economic losses for all the involved companies.

Considerable profits from using collagen from leather waste can be estimated as following. According to Xinmin Weekly, a ton of protein hydrolysate costs 1000 RMB. The cost of producing one ton of milk powder is twenty times higher; if protein hydrolysate was added the cost drops down below 5000 yuan providing roughly 400% profits (Feng, 2011).



Figure 2. Yashili International Holdings Ltd. 5-years stock dynamics

Average consumption of dairy products in China with distribution over provinces in rural and urban area is represented in figure 3. Northern and Western regions of the country show average 2-10 kg per capita; people in rural Southern areas almost don't consume milk on regular basis while Tibetans and people in Qinghai drink more than 30 kg of dairy products per capita (Ma, 2003).

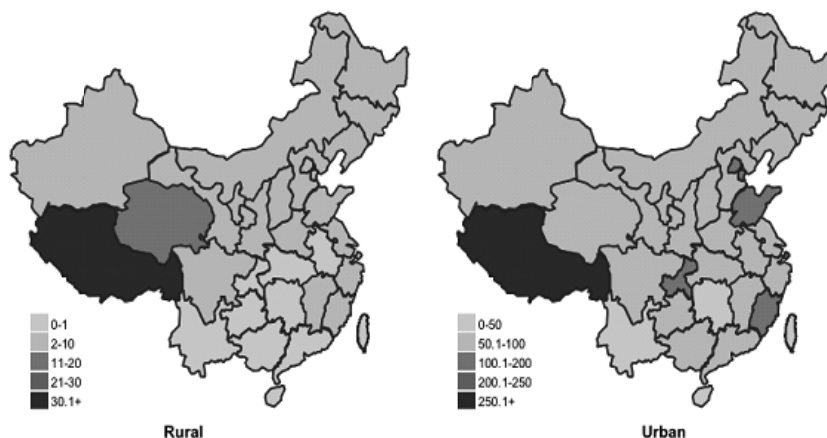


Figure 3. Per capita milk consumption in urban and rural areas of China

This distribution can be explained with Chinese traditions and meal culture that involves very few dairy products. Urban areas and large cities are usually described as areas with high income per capita that tends to incline people to seek for more intricate products consumption. According to Xin Ran, author of “What the Chinese Don't Eat”, widespread popularity of dairy products in China may partly be due to people who aspire to Western lifestyle.

It is also important to mention that many people of Asian race are lactose intolerant. In China this number is above 90% according to various studies (Yamamoto, 2010).

Meanwhile that problem is not common in Caucasian population of the world: only 10-15%, compared to 87% in India and about 50%, varying from country to country in the Middle East. This might be one of major limits to rapid increase of dairy products among other consumed foods.

Overall dairy market overview and its dynamics are listed in table 1.

Table 1. Overall China dairy market overview in 2010-2014

Item	2010	2011	2012	2013	2014 (est.)
Fluid milk output, 1000 tons	29.300	30.700	32.600	34.300	36.000
Milk cow numbers, 1000 heads	7.320	7.620	8.000	8.350	8.710
Fluid milk production, ton/head per year	4.00	4.03	4.08	4.11	4.13
Skimmed milk powder production, 1000 tons	55	56	57	54	49
Skimmed milk powder consumption, 1000 tons	144	186	225	289	379
Skimmed milk powder imports, 1000 tons	89	130	168	235	330
Whole milk powder production, 1000 tons	1.030	1.100	1.160	1.200	1.250
Whole milk powder consumption, 1000 tons	1.373	1.433	1.540	1.876	2.248
Whole milk powder imports, 1000 tons	326	230	406	619	1000
Average consumption value, CNY per person	198.5	277.0	347.5	466.2	574.4

Currently fluid milk production is growing in a stable manner annually by 5-7%, maintaining overall development of the industry. The nearest world trend and curve behavior is observed in corresponding data from Brazil which can be explained through the specific character of market (figure 4).

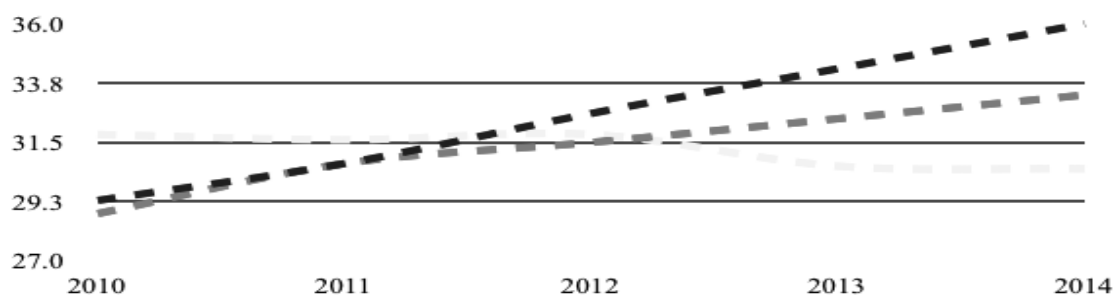


Figure 4. Fluid milk production in China (blue), Brazil (purple) and Russia (yellow).

It is clear that China fluid milk output keeps growing, in spite of the incidents listed above, especially in comparison to other Asian countries' dynamics. For instance, the corresponding market in Japan displays shorting output in last five years, resulting to only 20% of dairy market in China; currently it produces more fluid milk than Australia and New Zealand (9.9 and 21.4 thousand ton accordingly), but only about 30% of the US output.

## 2. Method

It is considered appropriate to measure economic efficiency of dairy industry by comparing fluid milk production per adult to number of cows measured annually. Judging from this point, China has quite high efficiency measuring on the average 4.1 tons / cow. To compare, Brazil has relatively same output amounts but it measures only 1.5 tons per cow, which means that it takes almost three times more cattle to cover the market needs, while India produces nearly 60 thousands tons of milk with the corresponding index 1.15 put into the consideration when the industry requires eight times higher cattle number (figure 5).

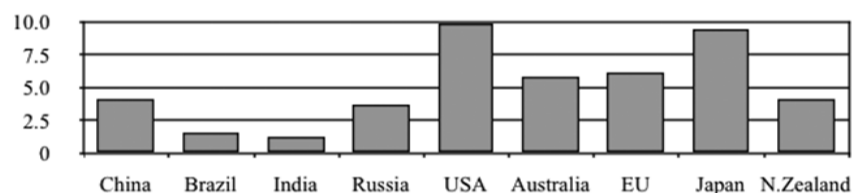


Figure 5. Dairy industry efficiency measured as output per cow, thousand tons

Indeed, further comparison of the numbers of adult cows engaged in milk production shows the following data. There are 8.7 million head of cattle in China in 2014 while Brazilian market is served with 23.0 millions, North American (US, Canada) production is carried out by 16.6 million animals, European Union counts 23.5. There are 50 millions milk cows in India, 8.2 in Russia and 6.9 in Oceania (Australia, New Zealand).

Another index for comparing is fluid milk consumption because it shows how much of the market is covered by national producers. Fluid milk is used in many key industries of dairy such as milk powder or cheese manufacturing. Aside from that, due to large population, China has a relatively large consumption data measuring in 15.1 thousands of tons (2014), comparing to Brazil (12.4), Russia (10.0), Australia (2.5). But it consumes less than the US (28.9), EU (33.6) and India (57.4 thousand tons).

Almost all the cheese on the Chinese market is imported; average annual import measures at 18-20 thousands tons with annual growth of 15-20%. Most of the cheese comes from New Zealand and Australia, taking nearly 70% of China's cheese market. A certain amount of cheese has American origin; it measures at approximately 10%. Some domestic producers provide a relatively small amount of cheese to the market, shared mostly by five large corporations (Woolsey, 2010).

Yoghurt is another popular product with emerging market that gains about 15% annually. Though demand for this product was impacted by reduced customer trust since the events with dairy industry in 2009-2010, it still remains a promising direction; yoghurt is considered to be a healthy product among young parents and people who incline to Western diets. The most well-selling products of this kind are self-stable reconstituted yoghurts that are made of milk powder. Imported yoghurts are less popular than cheeses but this branch of market also displays stable growth rate of 1-1.5% per year. Except the common products, there are some niches on the markets explored by some local companies such as "Qinghai's Old Yoghurt" that appeals to minority culture; producer's profits tripled in 2009 after the introduction of this product in 2008, and keeps growing fast.

In figure 6 there is represented skimmed milk powder production in China in comparison to its consumption and imports. In 2010 the market demand was satisfied with local products but further on the most of the growing needs had to be fulfilled with imported products, leaving domestic production levels almost intact for last five years. Consumption growth is measured at approximately 30% annually, 20% of which are tied with imported materials and only 10% - domestic products. World market shows relatively slower consumption growth with average 10-15% per year, in some countries (US, Canada) the market was going down by 4-5% annually.

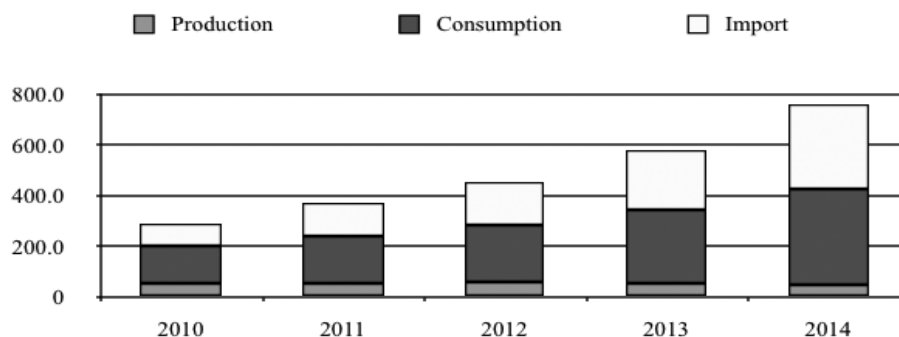


Figure 6. Skimmed milk powder production, consumption and import dynamics in China

Whole milk powder production, consumption and imports dynamics is shown on figure 7. China is a major consumer and producer of this type of dairy product, relatively all the demand is fulfilled with domestic supply. However increased needs did not boost production due to limited capabilities and shortage of milk cows, therefore imported-tied demand compensation occurred.

Average consumption growth is 100 thousand tons per year, which is three times greater than entire demand for milk powder in the United States. Another major consumer of this dairy product is Brazil, 500-600 thousand tons per year. Taiwan alone has a demand for 30 thousand tons yearly, it roughly equals Australian annual consumption of milk powder.

Average dairy products consumption value in China calculated in CNY per person has increased rapidly from approximately 200 in 2010 to estimated 574 in 2014. Considering low inflation rates, this growth represents overall trend of the market with larger demand and more kinds of products available.

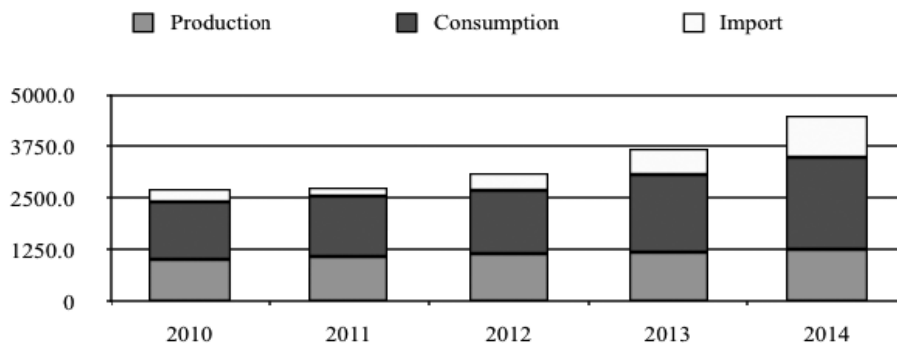


Figure 7. Whole milk powder production, consumption and import dynamics in China

Due to the issues mentioned in the article, many customers prefer imported or foreign-branded products developed by multinational corporations. Some foreign dairy brands have a large amount of assets invested into China (Danone, Nestle etc).

There are approximately 2000 companies in China that work in the field of dairy industry, roughly 1/3 are middle-sized enterprises with operational revenue 5 million RMB. However current model can be described as oligopoly with only four major producers controlling 70% of the market (China, 2013). As it often happens in such conditions, prices are a matter of agreement between major players, and entrance barriers are quite high.

There are five major indicators that display current economic condition for these major Chinese market players: total assets, operational revenue, main operating income and net profit; these parameters are listed in table 2.

Table 2. Main operational indicators million CNY, 2011/2012/2013

Company name	Total assets	Operational revenue	Operating income	Net income
China Mengniu Dairy Co., Ltd	20202 / 20991 / 40339	37388 / 36080 / 43357	1896 / 1494 / 1852	1785 / 1440 / 1862
Inner Mongolia Yili Industrial Group Co., Ltd	19930 / 20463 / 32877	37451 / 41991 / 47779	1746 / 1616 / 2659	1809 / 1717 / 3187
Shanghai Bright Dairy & Food Co., Ltd	7374 / 9339 / 11568	11789 / 13775 / 16291	200 / 355 / 626	238 / 311 / 406
Hebei Sanyuan Foods Corp.	3472 / 3645 / 3517	3070 / 3553 / 3788	-99 / -58 / -294	49 / 33 / -227

China Mengniu Dairy Co., Ltd operates country-wide market and owns over 30 production facilities in most milk-producing provinces, manufacturing three types of foods: liquid milk, ice cream and milk powder. It emerged from Inner Mongolia Yili as its former worker started his own company in 1999. The corporation is also known as the “Space milk” since it was an official partner to the Chinese space program (China, 2013).

Mengniu Dairy economic assets were widely damaged during melamine-related scandal since its products were tested positive for that chemical. With further problems occurring in the industry, it continued losing market value as it can be seen on figure 8.

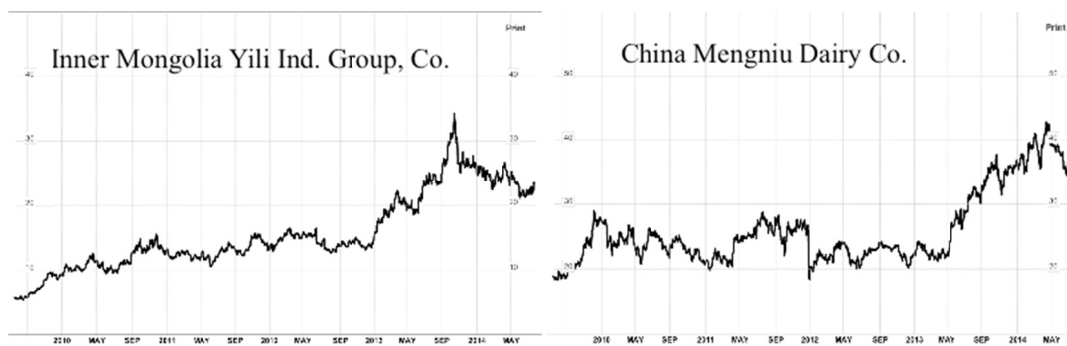


Figure 8, 9. Major China dairy producers’ stocks value dynamics, 5-year period

However total assets of the corporation have doubled in a three-year period, operational revenue in 2013 increased by 20% compared to the previous period, after a 4% decline in 2012 compared to 2011. Net income increased by 4% in a three-years span. Considering overall decrease of operating income, it is likely that company was under depreciation or had severe operating expenses since assets grew and extended amortization would not be a reasonable measure in such case. In the beginning of 2012 the stocks went down again due to an inspection discovering aflatoxin M1 (140% above allowed amounts) in its products (China's, 2013).

Another Chinese dairy giant and Mengniu's main competitor is Inner Mongolia Yili Industrial Group Co., Ltd. Established in 1993, it is also based in the city of Hohhot. The range of produced dairy is relatively similar, with rapidly increasing net income since 2011 when it was relatively close to its competitor (1785 and 1809 million yuan correspondingly) to 3187 million yuan in 2013.

This growth might be explained through cheaper materials or more efficient technologies used in production since operational revenue did not increase that much while operating income nearly doubled; the stocks do not indicate any major investment or market fluctuations in the given period, eliminating advanced technology-related reason from the hypothesis and confirming that profits likely doubled for some source-involving reason (figure 9).

Yili was a part to the melamine scandal as well, recalling flawed products and apologizing to its customers (Investors dump financials, 2008). Except the loss of stocks values and substantial market positions, the corporation lost its title as a "Chinese national brand" resulting in disastrous economic losses. In June 2012 the enterprise had taken initiative before another serious issue opened up when its baby formula was deemed to contain high levels of mercury, and withdrawn the suspected products from the market. It is important to mention that unlike the older security standards, current regulations do not impose critical mercury levels in products, therefore technically the corporation did not violate the rules; however due to the initiative, public reception of this case was overall positive and did not harm the profits and stocks significantly.

Shanghai Bright Dairy & Food Co., Ltd. is a government-based enterprise situated in Shanghai. Its business model is based on four subsidiaries which manufacture other products aside from dairy such as poultry, pork, and candies. In 2010-2014 the company acquired controlling stakes of a number of foreign-based enterprises: 51% of Synlait (New Zealand), 75% of Manassen Foods (Australia) and 56% of Tnuva (Israel). The latter two deals brought it significant stock value growth as shown in figure 10.



Figure 10, 11. Stocks value dynamics, 5-year period (Bright Dairy, Hebei Sanyuan)

The Shanghai corporation data appears to be a picture of classic smooth development in last three years; all four parameters kept growing at a stable rate. In the scale of current economic growth, the cases of 2010 don't appear to be a moderate threat but the stocks graph displays a dramatic decrease of value that nearly dropped half, causing short-term losses since the company was not directly involved in any of the scandals.

Sanyuan is a group of companies headquartered in Beijing and owned by the state (12 farms, 20 enterprises, 41 transnational joint ventures, 3 overseas subsidiaries and one public company Hebei Sanyuan Foods Corporation engaged in manufacturing of dairy products. It was the only company that had government protection and supervision in dairy scandals of 2008-2010 due to its role as an official partner and supplier of the Olympics (Sanyuan may take over, 2008). It caused a 52%-stock value surge in five days since the announcement of ACSIQ regarding products purity.

However current economic conditions may not allow calling this corporation successful; its statement is negative with profits declining from 49 to -227 million yuan in three years. Operating income was negative through all the period, resulting in severe exposures. Meanwhile operational revenue kept growing with total assets number being nearly intact in the scale of events. According to the corporation management's official statements, the losses were primarily due to increased raw milk prices; this reason might follow the point that most of the products were targeting at the low-cost niche and the company had no premium-class products to offset the costs. Another reason listed in the analytics is that the company had a number of unsuccessful investments with declining revenues; the stocks value confirm this idea rather than higher milk prices that were supposed to hit all the participants of the market which as we know did not occur (figure 11).

### 3. Results

Therefore it is clear that having problem-plagued products brings moderate and severe negative impacts on all the companies working in the industry; at the same time having absolutely clear products, even those that were confirmed at a higher level does not bring warranty of high profits in a long time period. Current market situation with 4 major players leaves only 30% of the space for other companies and it is not promoting fair competition for customers' weal, it keeps opportunities to protect the large profits and keep the dairy industry within a dangerous trend.

Judging from history of enterprises and existing theories, pure economic solutions of this problem are not available. Administrative measures taken alone will not be efficient either. China needs a new economic approach in dairy security that could make it profitable to use pristine materials in spite of higher costs, and this model needs administrative methods for mediation and protection. Producers need to understand that using that sort of strategy may be expensive at the beginning but another option involves losses over 50% of market value that may be devastating, especially considering the overall trend when customers slowly incline to foreign products.

The solution may be in a system that provides better taxing options and other benefits to large companies that create smaller enterprises and target at premium products market or goods. These ventures could eventually become larger companies as it happened to Yili, or occupy a small part of the market with loyal customers. Both results are beneficial to the industry, people and corporations, considering a relatively small amount of assets required for implication of such ventures, bringing consumers back with the belief that Chinese dairy industry can eventually be stable.

Meanwhile the problem remains sharp not only in China; for instance, Michael McMenamin's 1980 book "Milking the Public: Political Scandals of the Dairy Lobby from L.B.J. to Jimmy Carter" describes a series of industry-driven questionable interests carried out through the political system. Being put into the corresponding conditions, producers and enterprises naturally incline to diverge the restrictions and standards.

On the bright side, that sort of negative experience brought the government and the public to the point where everyone needs to pay more attention to food security. This creates pressure on the corporations that need to inform people about problems in time and to recall faulty products as quickly as possible.

There is certainly the need for further research, information exchange, consolidation and collaboration between scientists, governments and civil societies to transform the current system towards decentralized agroecological structure. Probably the ultimate goal of modern civilization is not to maximize profits at any cost but to build a well-balanced world.

### References

- Aldred, S., & Kwok, D. (2010). KKR's dairy farm plan points to future of China's milk industry. *Reuters*. Retrieved from <http://www.reuters.com/article/2013/09/24/us-kkr-chinadairy-idUSBRE98N08H20130924>.
- Chi de zhenxiang 3: Dai ni ren qing du shi*. (2012). Beijing: Tsinghua University Press.
- China dairy industry. (2013). *China Business Insight*. Retrieved from [http://www.tusiad.org/\\_rsc/shared/file/ChinaBusinessInsight-December2013.pdf](http://www.tusiad.org/_rsc/shared/file/ChinaBusinessInsight-December2013.pdf).
- Financial analytics, stocks information, profiles*. (2014). Retrieved from <http://bloomberg.com>
- Investors dump financials and dairy producers*. (2008). *South China Morning Post*, 4, 12-13.
- Lin, L., & Cruz, J. (2013). China's Parents Crave Illegally Imported Baby Formula. *BusinessWeek*. Retrieved from <http://www.businessweek.com/articles/2013-05-02/chinas-parents-crave-illegally-imported-baby-formula>



- Ma, H., & Rae, A. (2003). Projections of Dairy Product Consumption and Trade Opportunities in China. *China Agriculture Working Paper*, 2, 3-10.
- Qian, W. (2008). Sanyuan may take over tainted milk brand Sanlu. *China Daily*. Retrieved from [http://www.chinadaily.com.cn/china/2008-09/27/content\\_7064279.htm](http://www.chinadaily.com.cn/china/2008-09/27/content_7064279.htm)
- Report for Selected Countries and Subjects. (2013). *International Monetary Fund*. Retrieved from [imf.org](http://imf.org).
- Stocks and financial information*. (2014). Retrieved from <http://www.morningstar.com>
- Wang, S. (2013). China New Import Regulations for Dairy Products. *Swiss Business Hub China*. Retrieved from [http://www.s-ge.com/en/filefield-private/files/58348/field\\_blog\\_public\\_files/19904](http://www.s-ge.com/en/filefield-private/files/58348/field_blog_public_files/19904).
- Woolsey, M., Zhang, J., & Zhang, S. (2010). *China Dairy and Products Annual*. Retrieved from <http://www.fas.usda.gov/>
- Yamamoto, B. (2012). *Map of Milk Consumption & Lactose Intolerance around the World*. Fullerton: California State University.
- Yiran, F., & Gisela, S. (2011). Leather Milk' Surfaces in China. *The Epoch Times*. Retrieved from <http://www.theepochtimes.com/n2/china-news/leather-milk-surfaces-in-china-51637.html>.
- Zheng, J., Li, C., Ostroumov, L. A., Prosekov, A. Ju., Zheleznov, A. I., & Smirnova, I. A. (2009). Standarty kachestva v syrodelii Rossii i KNR: harakternye osobennosti i perspektivy integracii. *Syrodelie i maslodolie*, 1, 45-49.

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