

China's Dairy Import Industry: An Economic Analysis of Influencing Trade Factors

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Received: December 21, 2015 Accepted: January 15, 2016 Online Published: February 25, 2016

doi:10.5539/jms.v6n1p182 URL: <http://dx.doi.org/10.5539/jms.v6n1p182>

Abstract

One of the most dependable trends in a country's transformation from an undeveloped, to developing, and to developed country is a growing demand for dairy products and milk. As China has undergone an unprecedented transformation over the last few decades since Deng Xiaoping's Open Door Policy, China has followed this trend of an increasing demand for dairy products. As with other industries in mainland China, the domestic dairy industry is progressing at an incredibly fast rate. Yet at the same time when China is building its own industry to meet the growing demand, trade liberalization by joining the World Trade Organization has brought intense competition from foreign milk producers such as New Zealand, Australia, and the United States. This thesis examines the factors that influence various facets of the Chinese dairy industry, including import and export trade, consumer demand, and domestic and international competition. In addition to a deep background assessment of the Chinese dairy industry and market, a Constant Market Share econometric model is utilized to assess the varying levels of influence that different factors have on the industry by using three different time periods as a model of assessment for the whole industry.

Keywords: agriculture, constant market share, China, dairy, import trade, international trade policy

1. Introduction

The rate of development of a country's livestock industry is the cornerstone of building a state's power and modernity, and the development of dairy livestock is the most important symbol. A developed dairy industry, including a modernized rural population, is directly correlated to a country's quality of life and is pivotal in developing the agricultural economy. Furthermore, if one looks at the timeline of development for any developed country in the world, a clear correlation between the implementation of dairy policy and modernity appears. China's dairy industry is still largely undeveloped, among the least developed in the world. Since the open door policy of 1987 and joining the World Trade Organization in 1997, China has been putting immense emphasis on the growth and development of its dairy industry.

In August 2000, the Central Government of the People's Republic of China implemented a new set of policies aimed at increasing food safety for the decade of 2000 to 2010. On September 27, 2007 the State Council issued a declaration "Suggestions on the Development of Health & Safety for Milk Products." This marked the beginning of the State's active promotion of building the dairy industry. In the 90's, China's dairy yield hovered around 500 tons per year. In 2006, China's annual dairy yield reached 33.6 Million tons. For the past couple years, the average annual growth in dairy yield is about 14.6%. In 1990, the average dairy consumption per person sat at a meek 3.7 kilograms of milk annually. Fast forward to 2006 and that number has risen to 24.4 kilograms of milk. However, keep in mind that this number is still only about as 25% as much as the world average. As China entered the 21st century, there is still a plethora of problems in cattle-raising, milk production, technology, and everything else across the board. Because of these problems, Mainland China is still far behind its western counterparts. This is true in terms of infrastructure, consumption, and market competition for the dairy industry.

With changing standards of living and rising incomes, the diets and food-purchasing habits of Chinese consumers are changing rapidly, as well as the entire structure of the food industry. After complying to the World Trade Organization's new tariff decreases for dairy products, China ended their subsidy for domestic dairy products for export, as well as ending several other trade policies of the 90's. As a result, China became a

much more attractive destination for foreign dairy exporters.

Data shows, from multiple sources, that China has been the number one importer of dairy products in the world since 2003. Furthermore, China's Central Department of Statistics reports that dairy products make up 82.3% of imports in 2013. Dairy imports also account for 87.6% of the total money spent on imports in 2013. A comparative statistical analysis also shows that dairy imports increased 9.4% in 2014, and the total price of dairy imports increased 25.7%. This data clearly shows that China's appetite for imported dairy products is growing rapidly.

In regards to the massive trade deficit caused by dairy imports and the future development of China's dairy industry, is it time for China to decrease this demand for foreign dairy products? At the end of the day, what are the driving factors causing China's dairy industry to be so dependent on foreign products? What steps should the Chinese Government and market players take to decrease the chance of damage to the local industry caused by foreign imports being so huge? How can China take advantage of free trade to benefit its' dairy industry? These are all questions we should be thinking about in this process.

It is absolutely imperative that China's dairy production industry continues building its' infrastructure. China needs a large-scale systematization of the dairy industry; from hay farming, dairy cow husbandry and health, cow feed, milk testing and obtainment, to dairy processing and and maintenance. This systematization is necessary to be set up with specific Chinese characteristics, in order to establish a solid barrier to foreigners trying to enter the Chinese market, and give China a home-field advantage in the dairy industry.

China's dairy companies must also implement large-scale production and establish conditions favorable for innovation in management and sales. Time will be necessary to build strong competitive enterprises; yet China needs it as soon as possible. Because of the unreasonable and ineffective nature of the current horizontal supply chain in China's dairy industry, it's imperative that we analyze the competitive relationships in China's dairy industry. Only then can we determine the conditions that would be necessary for China's dairy industry to reach its full potential.

2. Literature Review

A main conclusion of the previous research shows that in early years, the study on the dairy trade and development trend in China was conducted mostly by foreign academics. Only after about 1997 did Chinese academics begin domestic research on the dairy industry and trade. This involved almost in all aspects of dairy development, but most of them are based on the theoretical level, through the establishment of empirical models to study the dairy industry and trade. Furthermore, most of this research is based on data and theory to explain the situation. There are very few researchers that have done a comprehensive empirical analysis of China's current dairy trade, consumption, and development.

As mentioned, several foreign researchers have done in-depth research on China's dairy industry. American researchers Tom Cox, Jean Paul Chavas, and Yong Zhu used an economic model to make a quantitative evaluation of trade liberalization of the global dairy trade industry in their 1998 paper *Trade Liberalization and the partial equilibrium analysis of dairy products*. The changing trend of the world and the United States dairy industry was predicted by using the partial equilibrium model. Simulation results showed that agricultural trade agreements in Europe will make the EU dairy prices fall by 6%, New Zealand dairy prices rise 5% to 8%, and the U.S. dairy prices will be impacted largely. While they didn't really touch on China's industry, they showed the effect full liberalization of the market has on the price of milk and dairy.

Nigel Mitchell's 2013 work *The new challenges of international dairy trade*, as well as Chen Guo Qiang's 2013 *Implementation of WTO rules on the development of dairy industry in China* are both relevant to this research topic as well. These two works both analyze the effect that the World Trade Organization's policies had on international agriculture trade. These two researchers showed that well-defined implementation of these rules from the WTO, specifically the prohibition of export subsidies, have helped to develop the world's dairy industry as a whole, and prove that free trade is a viable option, particularly for dairy products.

While these foreign researchers made great contributions, Chinese academics have made arguably more in-depth analyses on the industry. Liu Li Feng, Wu La Ping, and Zhang Xiao Juan were early researchers in the field with their 2005 collaboration *Market Structure and Characteristic Analysis of the import and export trade of China's dairy products*. This group of researchers used a theory-heavy approach to analyze the pattern of import and export of China's dairy industry, divided by country and type of dairy products. Liu Yi Zhuo and Sang Ya Jiao in their 2006 collaboration *Influencing Factors on the Growth of the dairy import trade in China* analyzed the factors that promote the growth of dairy products. They analyzed from two angles: the theory level and the

positive and negative aspects on the trade.

More recently, Wang Geng Xin in his 2013 paper *An empirical analysis on the influencing factors of the import trade of China's dairy products* utilized a double logarithmic model to analyze GDP and price separately, and analyzed the different influencing factors on these two aspects. While Wang Geng Xin's research is the most recent on the topic, it also failed to touch on the topic of internal growth in the Chinese dairy sector as an influencing factor on import trade.

These studies have important implications for the analysis of the factors that affect the consumption and import of dairy products in China, but the empirical studies on the impact of China's dairy imports are significantly fewer in number. Moreover, the impact of different factors is largely overlooked in these works, and internal growth of China's booming dairy industry is overlooked. Clearly the analysis done on this area is not comprehensive enough. Moreover, none of the previous scholars on this topic have utilized the Constant Market Share (CMS) model to analyze the dairy industry in China. Lastly, while these researchers have indeed made notable contributions to the research of this industry, due to the breakneck speed that the dairy industry is evolving in China, a new comprehensive analysis of the industry is needed.

3. Today's Chinese Dairy Industry

Raw Milk is the main and defining ingredient in any dairy product, the raw material that is the main topic of this research. This is the source of origin in the supply chain of the dairy industry, and determines the production cost behind any dairy product in circulation.

In terms of categorization, raw milk is can be used to create liquid milk products as well as dry milk products. Liquid milk products include UHT milk, pasteurized milk, yogurt, etc. Dry milk products include products such as milk powder, cheese, milk protein, etc. China produced 38.8 million tons of raw milk in 2012, for a total annual growth of 1.1%. Within this, milk yield reached 37.4 million tons for a total growth of 2.4%.

In terms of resource locations, China's main raw milk production takes place mainly in the north and little in the south. The main five provinces for production of raw milk are Inner Mongolia, Heilongjiang, Hebei, Henan, and Shandong. These five provinces account for 67% of the entire country's raw milk production. According to statistics provided by the Food and Agriculture department of the United Nations (FAO), the largest countries in the world for raw milk production in 2011 were India, America, China, Pakistan, Brazil, and Russia (Figure 1).

Due to the increasing demand for dairy products in China over the last ten years, China has already has already gone from number nine to number three for raw milk production in the world. Raw milk yield in in China over 2001 to 2011 increased by a whopping 13%, towering ver the world average of 2.1%. In the same decade, China's average buying price for raw milk also rose in correlation with the demand for milk, from 1.67 CNY per gram in 2002 to 3.29 CNY per gram in 2012, for a compound annual growth rate of 7.0%.

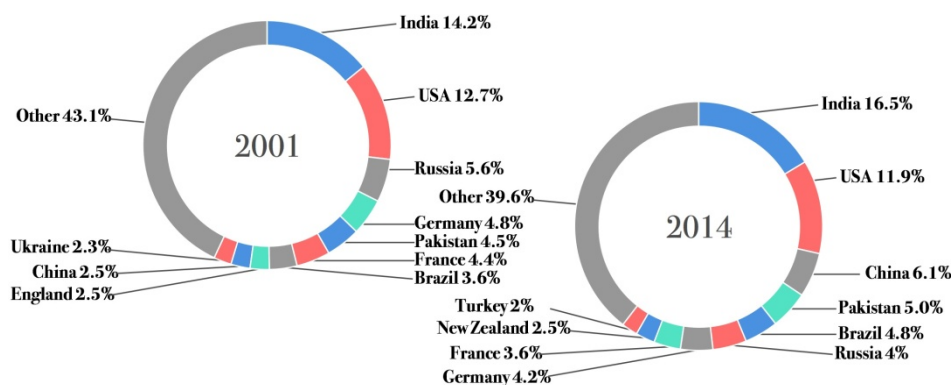


Figure 1. Global dairy production by country 2001 and 2014

Source: World Bank Data Center.

From a supply point of view, location is a key factor in determining price. Due to the fact that raw milk doesn't have a long time before it spoils, it needs to be processed in close proximity to the location of production before being transported. Therefore, raw milk demand is approximately equivalent to the annual yield of raw milk plus

the price of dairy imports in terms of its value as raw milk. In regards to domestic supply of dairy products, the supply is directly linked to the amount of dairy cow livestock and the per unit area yield.

Next, the profit factor of raising dairy cows is calculated in on top. Large scale livestock operations increase the per unit area yield. The supply and demand gap is directly dependent on compensating for the price of dairy imports. In summary, the raw milk supply and demand patterns, farming costs, and import prices of dairy products are the main factors that determine the price of raw milk (Figure 2).

The price of dairy cow feed has been increasing steadily over the past three years, making it difficult for China's dairy farmers to keep their operating costs down and squeezing away profit. Generally speaking, large scale dairy farms use combinations of alfalfa, silage, and soybean meal feeds to decrease their operating costs, but these feeds are usually expensive imports. At the same time, the way in which the Chinese government has propped up its domestic corn industry has driven the price of corn pretty high, which serves as a reminder of increasing domestic costs. Moreover, the price of labor, land, and several other costs are also increasing in China, making it difficult to produce raw milk at profit.

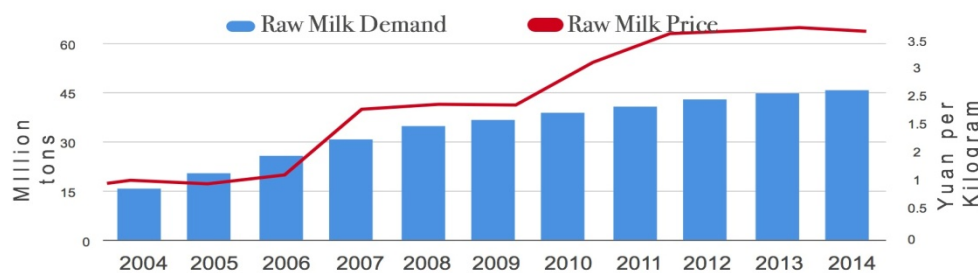


Figure 2. Sustained demand driving up the price of raw milk in China

Source: China Customs Statistics Yearbook 2014.

According to the data provided by Rabobank, since 2008, the rising cost of raw milk production, stimulating the domestic price of raw milk domestic prices to rise, even taking into account customs duties and VAT factors, etc. Despite all of this, China's largest dairy company quality milk supply is still higher than the import price by approximately 16%. Prices for imports are rising as well alongside their domestic counterparts.

According to dairy consumer preferences, imported dairy products still have a good market in China. Data from China's Customs department shows that in 2013, there was rapid growth of imports of milk powder and liquid milk. Milk powder imports rose 49 percent, and liquid milk imports rose 92 percent. In addition, there is a need to safeguard against blindly building huge dairy farms, which can be risky. In recent years, China has been building an impressive number of domestic dairy farms and investing lots of resources to improve milk production and quality. Some scholars believe that construction of these dairy farms has been hasty, the investment planning unreasonable, and also suffers from a serious lack of scientific oversight.

In terms of dairy consumption in China, there are also problems. Just recently, the major dairy companies in China have released their earnings for the first half of 2015. The data shows a big decrease in sales performance. China's industry experts say that most of the domestic milk companies this year are going through tough times. Businesses in general are in a difficult stage throughout the country, with recent political and economic hardships faced by the country. The second half of 2015 is looking to be a similar story. Currently, the development of the dairy industry is in a slump. To change consumer behavior, milk prices need to be adjusted, and the entire product structure may need to be overhauled.

Although the number of dairy livestock in China has increased greatly over the years, but China's agro-technology, techniques, and everything is in-between being relatively undeveloped and high tech. For example, China's dairy cows don't have a very high yield still. So despite having 10.82% of the world's dairy cows, China is only producing 6% of the world's total volume of raw milk.

According to the National Bureau of statistics, China's liquid milk production in 2014 decreased to 24,001,200 tons, which is down from 2013's 2,517,000 tons. China's national dry milk production output for 2014 sat 0.91% tons, down 4.17% from the previous year. From the output point of view, 2014's dry milk products production

output actually fell to the levels that haven't been seen since 2006. From the trend of the two groups of data it's not difficult to see the domestic dairy consumer market has entered a period of slow growth, but growth nonetheless (Figure 3).

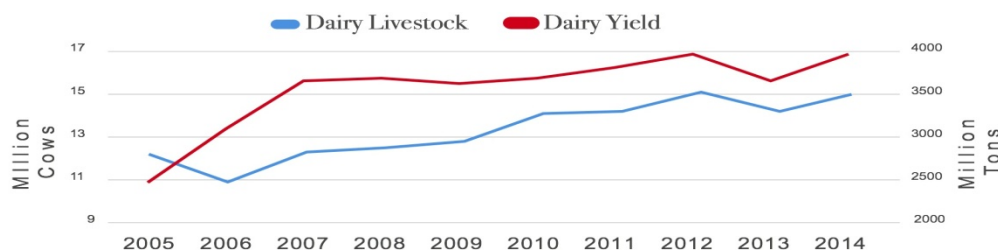


Figure 3. China's dairy livestock and total dairy yield 2005-2014

Source: China National Dairy Industry Network.

From a per capita dairy consumption and per capita GDP point of comparison, China's dairy consumption levels are still at a relatively low level. Even less than its Asian neighbors, China's per capita consumption of dairy products is 30% of Japan's level and 40% of South Korea's. However, because each country has a different set of consumption habits and different natural resources, the per capita consumption and per capita GDP is more than just a proportion or a correlation. If you follow the average regression line (Figure 4), when China's per capita GDP reaches 10,000 U.S. dollars, the per capita consumption of dairy products (in terms of liquid milk) will reach 146 kg / year, which is 3.7 times the current level.

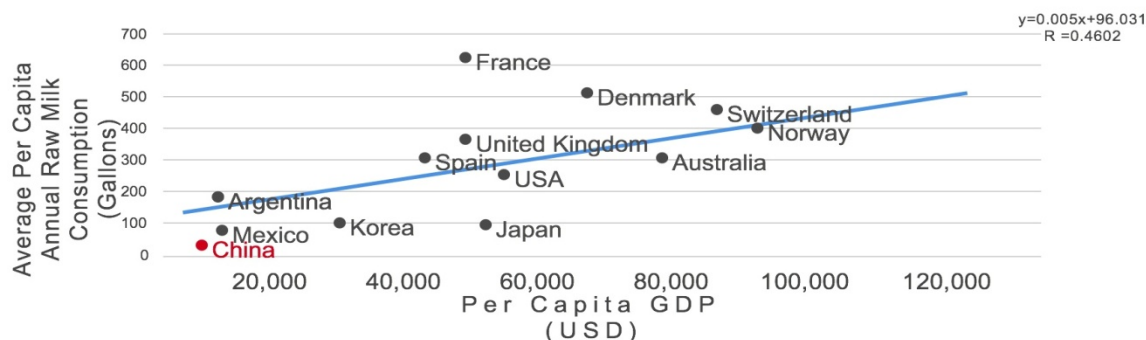


Figure 4. Average per capita milk consumption and per capita GDP

Source: World Bank Data Center.

4. Methods

With this in mind, we set out to research what factors are influencing the Chinese dairy industry, meaning both import trade and domestic development of dairy production. Moreover, we set out to research in what degrees these factors influence the Chinese dairy industry, and how their influence is manifested in economic terms.

To achieve this goal, our research is based primarily on analyses of commodity structure, market structure, and market competition of China's dairy product import trade. First, we analyze the Trade Competitiveness Index of China's dairy industry, to see how China compares to international competitors. Then the Constant Market Share (CMS) Model is used to analyze these factors affecting dairy imports to China. The analysis is conducted with a three-angle focus on the effects of market scale, market distribution, and market competition. Next, the model is used to determine the main factors that affect the Chinese domestic dairy industry. Through the effective use of the CMS Model's equations, estimations are made of the barriers faced by both sides (foreign and domestic) created by the tariffs in the Chinese dairy import industry, and results of changes of the tariffs.

However, our research goes beyond this data analysis. In fact, this thesis is based on a combination of theoretical and empirical analysis. Through the use of software analysis of data, qualitative and quantitative analyses are

performed to examine the current status of China's dairy industry and trade development status. This paper is done from the perspective of empirical qualitative analysis to study the factors of Chinese dairy imports, in other words, this is essentially an empirical analysis based quantitative model, supplemented by qualitative analysis. The thesis is then tested by the relevant countermeasures after empirical analysis. The main research methods utilized are as follows.

4.1 Comparative Qualitative Analysis

Through a comprehensive analysis of data, a comparison is made between China and other major dairy producing nations. This utilizes a qualitative *descriptive* analysis within as well. The comparison between China and other major dairy producing nations is conducted by comparing the factors of Raw Milk Production, Price of Dairy, and Dairy Consumption.

4.2 Descriptive Qualitative Analysis

Dairy imports are analyzed with Excel spreadsheets and graphs to paint a clear picture of the current status of China's dairy import industry. Quantities of imports with other countries are analyzed in terms of China's discrepancy with other countries. Through this, we can gain a description of the status of China's current dairy industry.

4.3 Mathematical Analysis

This thesis utilizes the relevant data and theory for the industry as its method of analysis through the use of a quantitative economic model. Through this use of theory and modeling, the influencing factors of the Chinese dairy import industry are revealed and confirmed. Through the use of the CMS model, we can see the amount of influence certain factors have on the industry. This creates constructive knowledge useful to the industry as a whole.

5. Analysis

At present, China's dairy industry is a highly competitive marketplace. The marketization is rapid, and there are three kinds of pattern of competition between foreign capital and domestic capital, national brand and regional brand competition, base-model dairy enterprise and urban-model dairy enterprise. To analyze these competing factors, the aforementioned Constant Market Share model is utilized. But first, a Trade Competitiveness Index must be flushed out for use in the model.

The Trade Competitiveness Index is typically used to theoretically indicate a relative advantage gained by a country's trade deficit.

The formula for Trade Competitiveness Index (TCI):

$$(TCI) = \frac{E_i - I_i}{E_i + I_i}$$

In this formula, E_i is the total amount of exports for product i to and I_i is the total amount of imports.

From the seven years of 1999 to 2006, the Trade Competitiveness Index (TCI) was edging closer to -1, with the exception of 2007, which saw a slightly increase. This data goes to show that the trade of dairy products in China is in a net import state (obviously), and the international competitiveness of China's dairy products is very weak. With the increase of the 1998 trade openness, China's dairy products weakened in international competitiveness. Dairy competitiveness dropped to it's lowest in 2002 after the accession to the WTO trade liberalization under the condition of two years later. The TCI then again dropped in 2003 and 2004 to -0.7752.

This was the bleak situation all the way until 2007, when China's international competitiveness of dairy improved to a TCI of -0.4957. Despite this improvement, China still did not have comparative advantage. The increase in 2007 is also due to the fact that dairy products that year had a slight increase in international prices, while the increase in the production of raw milk, making the domestic dairy products in the price advantage of the show, import to reduce exports increased. China's dairy products have long been a relatively competitive disadvantage is due to the fact that China's dairy industry is still very weak. After all, the industry is still in the development stage, and has a lot of improvement to be made.

Table 1. Trade Competitiveness for dairy products in China

	1999	2000	2001	2002	2003	2004	2005	2006	2007
TCI	-0.5662	-0.6218	-0.6902	-0.7584	-0.764	-0.7752	-0.6974	-0.7113	-0.4957

Next, the Constant Market Share analysis is utilized. Although there have been some scholars in China and abroad that have adopted this model to analyze the impact of the scale of agricultural product trade, there are no studies that have been conducted with this model used on the trade of dairy products. The Constant Market Share Model (referred to as the CMS model) was originally formulated for economic use in 1951, and later improved to the point that it became one of the most important tools for the study of international trade.

The model assumes that the market share of a country's ability to compete for a certain kind of export goods shall remain unchanged. As a result, the difference between the actual changes of a country's export commodities and the changes in the export volume of its competitors must be caused by the change of the structure or the competitiveness of the country. It is divided into three separate functions: market size effect, distribution effect and competition effect. Similarly, the model can be used to study the market share of a country's imports of a variety of goods from multiple markets.

Using this CMS model, this thesis makes a quantitative analysis of the import volume of dairy products in China from the two levels of dairy products and classification, and analyzes the effects from 1995-2011 on the scale of China's dairy industry, such as the impact of China's dairy industry, the imports, market structure and the market. The level of influence is then revealed.

The data used in this analysis comes mainly from the China Dairy Yearbook, the United Nations Commodity trade statistics database (UNComtrade), the Yearly Statistics Report from the World Trade Organization and other data about China's dairy imports from.

When it comes to the purchasing end of choosing a product, this thesis considers the possibilities provided by the data. The three largest internationally traded dairy products are examined: milk powder (including whole milk powder, semi skimmed milk and skim milk powder, and other milk and whey protein powders), butter, and cheese. The import volume data of global dairy products trade around the world is based on the statistics provided at the time of export in the source country. The data on Chinese milk, butter, and cheese import origin countries from 1995-2001 are in accordance with the customs tariff data collation. For the latter period in the analysis, that is from 2002 to 2011, the data was derived from the Yearbook of China's dairy industry and China's dairy industry statistics.

In terms of time and location, this analysis focuses on China from 1995-2011. The country's dairy imports accounted for more than 10% of the total annual imports of Chinese dairy products during that time. Specifically, the market structure is divided into Australia (11.80%), New Zealand (45.78%), United States (12.06%) and France (10.69%).

In line with the requirements of the CMS model's formula, on a basis of experience, this thesis set global dairy products import growth at a rate of 3.3%. The global rate of growth for import of dairy products during 1995 to 2011 was also calculated in to the formula. This includes import data on full cream milk powder, skim milk powder, cream and cheese, calculated during the years of from 1995 to 2011.

Growth trends for the dairy industry in China and the rest of the world are pretty consistent, the second period has more substantial growth than the third period in question. These three periods' growth rates in China's dairy products import are much higher than the world's dairy products import growth rate. The world's growth rate of cheese and butter import quantities in the period from 2002-2004 increases slowly. However, from 2005 onward marked the beginning of an improvement in the world dairy trade's situation, and the export of dairy products increased at a faster rate, especially from 2009 to 2011. The world's milk and cheese imports increased significantly, and the growth rate during period 3 was 17.4% faster than period 2. During this time, milk powder imports growth rate was 17%, while import speed of butter and cheese was actually slowing.

The volume of imports of dairy products in China increased by 119,300 tons in period 2 compared to period 1. During period 3, the volume of imports saw an increase of 267,600 tons. This growth is due to the effect of four forces: trade scale, product structure, market distribution, and competition.

5.1 Trade scale Effect

The first part is the trade scale effect, or market scale effect. From the years of 1995 to 2011, the global dairy

trade scale continued to expand and the volume of imports of dairy products was basically an upward trend, with an average annual increase of about 3.3%. The world's supply of dairy products was adequate. Due to a wide range of products and the low price of the export of dairy products, China's imports of dairy products saw an increase. Under the condition of keeping the original market share, the expansion of the market scale had positive effect on the import of Chinese dairy products. During period 1, trade scale effect caused the increase of 2,900 tons of dairy products. This is calculated to be a contribution of 2.43% during period 1. During period 2 and 3, trade scale effect accounted for the contribution of 1,020 tons of dairy products, which was a contribution of about 3.81% to the total trade volume.

5.2 Product Structure Effect

The changes in the structure of the import of goods have a positive effect on the growth of China's dairy imports, which indicates that China's imports of three kinds of commodities, cream and cheese are growing faster than the world's growth rate. From the total, the contribution of the first phase of the product structure effect increased by 300 tons, the contribution ratio was second. While the second phase increased by 1400 tons, 0.53% tons, the contribution rate increased by third. From a specific point of view, China's imports of milk powder in milk, cream and cheese, the proportion of the three kinds of goods, from the beginning of the first period is more than second, the proportion of 100% is still expanding; the structural effects of cheese is also positive effect, but because of its smaller proportion, so the effect is not obvious.

5.3 Market Distribution Effect

The effect of market distribution changes is positive, and also this effect is increasing. From period 1 to period 2, market distribution effect was 6,200 tons. The promotion of China's dairy imports increased by 5.16%; from second to third is a positive effect of 67,400 tons, a contribution rate of 25.19%. In the market, New Zealand and the United States share the largest share, and the export growth rate of dairy products in the two countries is much higher than the world's dairy export growth rate, so a greater positive effect; Australia and France have a positive effect, but the market is relatively small.

From period 1 to period 3, the market concentration of imported dairy products in China is increasing. As free trade between China and New Zealand establishes a substantial reduction in the tariff of dairy products, New Zealand has gradually become China's largest import of dairy products for China, thus China has become the most important market for New Zealand. From period 1 to period 3, the proportion of China's imports from France is also increasing. While the proportion of imported dairy products in China from Australia 11.48%, down to 11.08% in 2002 to 2004, compared with 2009 to 2011 at only 4.47%.

Table 2. Effect of Market Distribution during 1995-2011(broken into three periods)

	Australia	New Zealand	USA	France	Total
Period 1 1995-1997	11.48	54.81	26.29	7.42	100.00
Period 2 2002 to 2004	11.08	72.05	3.69	13.18	100.00
Period 3 2009 to 2011	4.47	76.29	4.59	14.65	100.00

Table 3. Total Dairy Product Imports and Exports 2012, 2013, 2014

	Import		Export	
	Kg	USD (million)	Kg	Usd
2012	1,088,400	2430.21	621,000	77.18
2013	1,519,000	3578.21	689,000	89.73
2014	1,805,600	4089.37	725,000	96.49

5.4 Competition Effect

In the years from 1995 to 2011, the competitiveness in the market of dairy products in China is the leading factor in the growth of imports of dairy products. The impact of competition on China's imports of dairy products has always been positive, and the most significant effect. This shows that compared with the dairy products import market competitors, China has a strong import competitiveness. From the changing trend, the competitiveness of China's imports of dairy products increased the intensity of the role has been enhanced.

From period 1 to period 3, the positive effect of competition is 109,900 tons. From period 2 to period 3, the positive effect was a total of 188,600 tons. This was an increase of 78,700 tons. The contribution rate on China's dairy imports increased by 92.17% to 70.47%.

From the above analysis, we can see that, from period 3 to period 2, and from period 2 to period 1, in two stages, China's huge demand for dairy products is the main reason for the rapid increase of China's dairy imports. Its contribution rate is the highest, followed by the change of market distribution, the expansion of the world's dairy trade and the effect of commodity structure, but the impact is not big compared to competition.

Table 4. Results of the CMS model on Chinese dairy imports

	Period 1 vs. Period 2 growth		Period 3 vs. Period 2 growth	
	Contribution (tons)	Contribution rate (%)	Contribution (tons)	Contribution rate (%)
Total Effect	11.93	100	26.76	100
Trade scale effect	0.29	2.43	1.02	3.81
Product structure effect	0.03	0.24	0.14	0.53
Market Distribution Effect	0.62	5.16	6.76	25.19
Competition Effect	10.99	92.17	18.86	70.47

6. Conclusion

Based on the current situation of China's dairy industry development and the status quo of the import and export trade, this thesis makes a theoretical and empirical analysis of the impact of China's dairy products import trade, and draws the following conclusions:

First of all, whether it is raw milk production, dairy processing or dairy consumption, China has achieved respectable, even impressive, advancements in development. But because of the advanced nature of the world, China has a certain gap compared with its foreign competitors. From a data point of view, China's urban and rural dairy consumers have a significant difference. In 2013, China's urban residents per capita consumption of dairy products was 37.54kg, but only 8.15kg for their rural counterparts.

Secondly, China's dairy import and export trade has been in a net import state for a very long time. China's dairy products trade, due to high variety of products in both import and export countries, consumer market and so on all show different signs of growth. The exporting countries for milk, milk protein/whey, and other dry dairy products are mainly New Zealand, Australia, France and the United States.

Thirdly, the supply of raw milk in China has a very low price elasticity, at only 0.0137. The level of the cow yield per unit area is 0.870, the scale elasticity of dairy cow breeding is the highest at 0.972. This data shows that dairy livestock are an important factor affecting the amount of raw milk supply in china. China's raw milk production will still be in the quantity expansion stage well into the future. By expanding the number of dairy livestock the infrastructure can hold, China can improve its raw milk supply. Therefore, China needs to improve the level of dairy cows to expand its supply of raw milk.

Finally, this paper's highlight is the analysis of the impact factors influence on China's dairy imports. The results of the Constant Market Share model show that the impact of China's dairy products on import trade, including raw milk production, dairy consumption, dairy products international domestic prices, household income levels, alternative consumer goods and national policy have a total of four. Four different factors together, including competition in the dairy market as the main factor. In addition, China's imports of dairy products in different countries are affected by different factors, showing different characteristics, the international domestic price is the most important factor affecting the total imports of New Zealand and Australia. On the other hand, the factor

of national trade policy is the most important factor affecting China's imports from the United States.

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