7/4/2017

China Dairy: the growth of an industry.

The internal growth of the Chinese dairy industry.

NUFFIELD
NEW ZEALAND
Global Vision, Leadership and innovation in Agriculture

Bede O'Connor

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5 Executive Summary.

China is currently the most important market to the New Zealand Dairy Industry.

I first visited in 2014 and soon realised there were some large differences to the information New Zealand Dairy Farmers believed to what was actually happening on the ground in China.

Rapid development was occurring in the Chinese Dairy Industry and the potential for a significant increase in production through minimal improvements was apparent.

Knowing the Chinese people had the ability to modernise industry rapidly, I felt there was a potential threat to the New Zealand Dairy Industry; my livelihood.

On reflection, China will struggle to meet growing demand internally due to factors such as poor management, substandard feed quality and increasing environmental pressures.

Barriers to rectifying these problems will be faced by the Chinese Dairy Farmer through Chinese consumer pressure for sustainable on-farm practices such as reducing the environmental impacts of housed dairy operations.

New Zealand can capitalise on this by increasing the amount of due diligence on the analysis of risk in China.

New Zealand needs to beware that the threat to export markets is not only from internal Chinese production, but also from that of their European counterparts. New Zealand needs to clearly differentiate their products by becoming Genetic Engineering (GE) Free.

New Zealand must invest in relationship building with a long-term view to match that of Chinese relationship ideals.

The New Zealand Dairy Industry needs to change how it participates in the evolving Chinese consumer market to, maximise returns to it's farmers.

6 Personal Introduction

Bede O'Connor, 2015 Nuffield Scholar

Above: Bede O'Connor and Angela Leslie.

I am a 46 year old dairy farmer based on the West Coast of the South Island. My partner, Angela Leslie, and I farm a 330 cow seasonal supply dairy farm 10 kilometres from Westport.

I completed a BCom Farm Management at Lincoln University in 1991. I have undertaken additional development programmes including a leadership and governance course completed in 2014 run by Development West Coast.

In 2015 I attended the Worshipful Company of Farmers Advanced Farm Management Programme at Royal Agricultural University in Cirencester, UK.

On completing University in 1991, I returned to the family farm where I lower order Sharemilked for 8 years. After this time taking a break from farming, I moved to Auckland and undertook a role as Contracts Supervisor for Arneg New Zealand. The primary work in this role was supervising the installation of display fridges and freezers in commercial retail stores throughout the North Island.

After 5 years based in Auckland I returned to farming in Westport to manage a developing, large scale dairy farm milking 800 cows.

In 2010 I went back to the family farm with a succession plan put in place for completion in 2012, when I took full ownership.

I have achieved a 50% production increase since returning to the farm and am currently looking to reduce reliance on off farm grazing and outside inputs to enable self-sufficiency.

Outside the farm gate, I have taken a number of roles in various organisations with the aim not only to enhance my skills but also contribute to agriculture for the benefit of the whole farming community by bringing my learnings and experiences to the table.

Current roles include…

- Deputy Chair, West Coast TB Free Committee

Enabling Ospri to reach the goal of Bovine Tuberculosis eradication in New Zealand cattle and deer herds by 2025.

- Trustee, West Coast Focus Farm Trust

A project that was developed to allow West Coast dairy farmers to access regional pasture growth data to enable them to make pasture management decisions increasing their profitability on farm.

- Trustee, West Coast Rural Support Trust

Working in the farming community to support and promote wellness and those facing difficult times.

Until recently I was a director of Westland Milk Products, a West Coast based dairy co-operative collecting all West Coast milk and a portion of Canterbury milk. As a director, I was exposed to all facets of the business in a governance role that you would expect from a company that has a turnover of over $500,000,000.

7 Methodology.

The methodology used to do my research was through asking a set of interview questions (Appendix 1) to industry professionals (Appendix 2), researching papers and conducting international travel.

This report aims to give a snapshot of the Chinese Dairy Industry as it stands, answer what influence the Chinese Dairy Industry has had and may have in relation to the New Zealand Dairy Industry and how New Zealand can capitalise on this.

7.1 Summary of travels.

Since being awarded my Nuffield Scholarship in 2015 I have travelled extensively as both an individual and as a part of Nuffield groups.

The first travel that inspired my research topic was with Westland Milk Products as a director in 2014 to China. On this trip, I spent a total of 10 days visiting several dairy associated companies and farms as a step to improving my China knowledge for the benefit of the Board.

January/ February 2015

Attended the Worshipful Company of Farmers Advanced Farm Management Programme at Royal Agricultural University; Cirencester, UK.

Upon completion of this I travelled in the UK to visit a number of agricultural and farming businesses.

March 2015

Attended the Nuffield Contemporary Scholars Conference; Rheims, France. This gave an overview of French agriculture and the EU as a trading block.

Following this I returned to the UK for more farm visits, travelling on to Ireland and the Netherlands continuing to visits farms and associated businesses.

April 2015

Travelled to China, visiting farms and meeting with dairy experts.

March 2016

Attended the Nuffield Contemporary Scholars Conference; Cavan, Ireland. This conference covered European Agriculture and the progress made by Irish agriculture since the global financial crisis as a key driver to the growth of the Irish economy.

Following the conference in Ireland I visited a number of fellow scholars and met three dairy cooperative CEO's for discussions.

I then returned to both the UK and the Netherlands for follow up farm visits.

May 2016

Travelled to China. I visited dairy farms and was able to meet with some experts that I had met with 12 months prior, to gain an understanding of how their views on the dairy industry had changed.

June/July 2016

Nuffield Global Focus Programme (GFP) travelling to Singapore, Philippines, Hong Kong, China, Canada, Colorado; USA, Washington DC; USA and the UK.

During the GFP, as a group we visited all types of farms and agricultural businesses along with gaining an overview from government officials in many of the countries.

8 Foreword.

The people of China drink more milk and consume more dairy products than ever before. The new generation of Chinese children are consuming dairy products daily and parents are relying on dairy to provide critical nutrients to ensure their children grow to be strong and healthy.

With the dairy industry being an integral part of my life I began to wonder how China was going to fulfil its perceived demand for the 'white stuff'. It seemed logical for New Zealand exports to be consumed with the need to supply more.

The necessity to understand the evolution of the dairy industry in China was apparent. The Chinese dairy sector was going through a stage of transformation and the need for New Zealand dairy exporters to gain a greater understanding of how this would influence how they would do business was obvious.

The Chinese Dairy Industry is changing rapidly, therefore this report is a snapshot from my travels and investigation over the last two years. A recent example of such uncertainty in China is the partial collapse of Huishan Dairy, the largest corporate dairy operation in China.

Would China grow its internal production? Would this affect the New Zealand dairy industry and ultimately our farming business and that of my peers? Was there potential for another country to beat New Zealand to the spoils of a country facing major growth? These were all questions I set about answering when I began to undertake my Nuffield studies in 2015.

9 The evolution of dairy in China.

Traditionally dairy has not been a part of the traditional Chinese diet. Milk was consumed in the North and Western regions of China by pastoral farmers, who farmed their own cows, for their own consumption. (Rou, 2014)

Chairman Mao posted economic reforms in 1978 which allowed privately owned farming and encouraged investment in such practices.

The industry grew rapidly in China within the grassland provinces. In 1993 the Chinese Government allowed competition from foreign enterprises.

Dairy products were largely powdered as there has been a lack of a reliable cold chain throughout China. This changed when exporters to China introduced them to Ultra High Temperature (UHT) milk. China was able to import technologies to produce UHT and for the first-time processors could be situated close to their supply base which was often further away from populated areas. (Rou, 2014)

As larger dairy processors were scaling production, small dairy processors began to disappear in the 2000's. These large processors continued to collect milk from millions of small farmers. (Rou, 2014)

Demand for imported milk powders grew after the 2008 melamine scandal and consumer confidence in domestic product fell. This led to further consolidation of the industry and has shaped it into what we see today.

10 Milk production in China.

The distribution of milk production sees the majority produced by the Northern provinces in China (Figure 1). This distribution is made up of small scale farmers with herd sizes of approximately 20 cows up to the large scale dairy farms of approximately 1000 cows. The China Dairy Yearbook 2013, stated that at that time there was 60 farms with over 10,000 cows on a single farm.

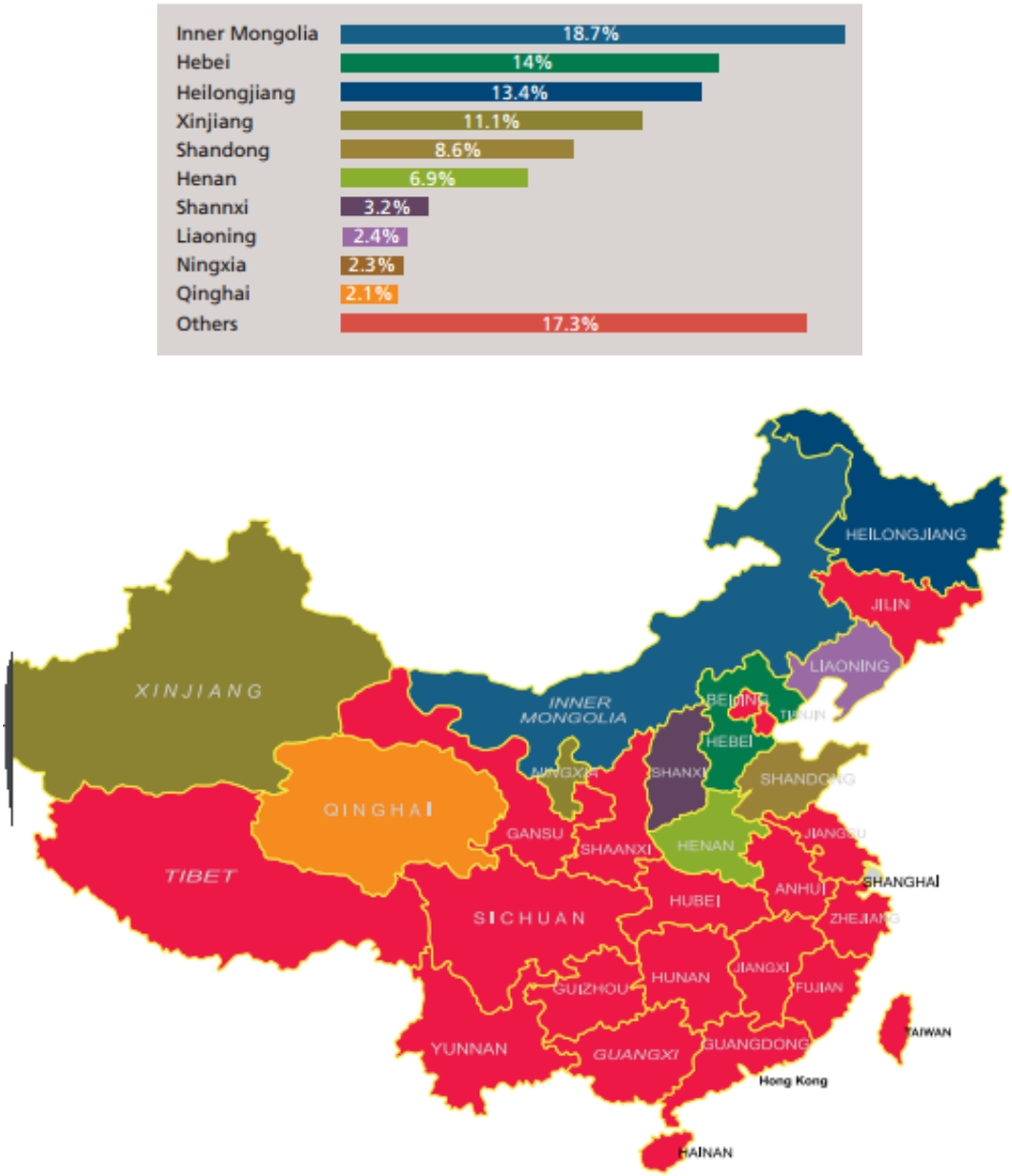

Figure 1: Distribution of dairy farming in China (Xu, 2015)

Chinese milk production has varied since 2003. The peaks in Chinese milk supply can be correlated back to global milk price where there were spikes in 2008 and 2014 which are seen in Chinese milk production (Figure 2). During times of high global milk prices, China has attempted to buffer the high global milk price by increasing internal milk production. (Kai, 2014)

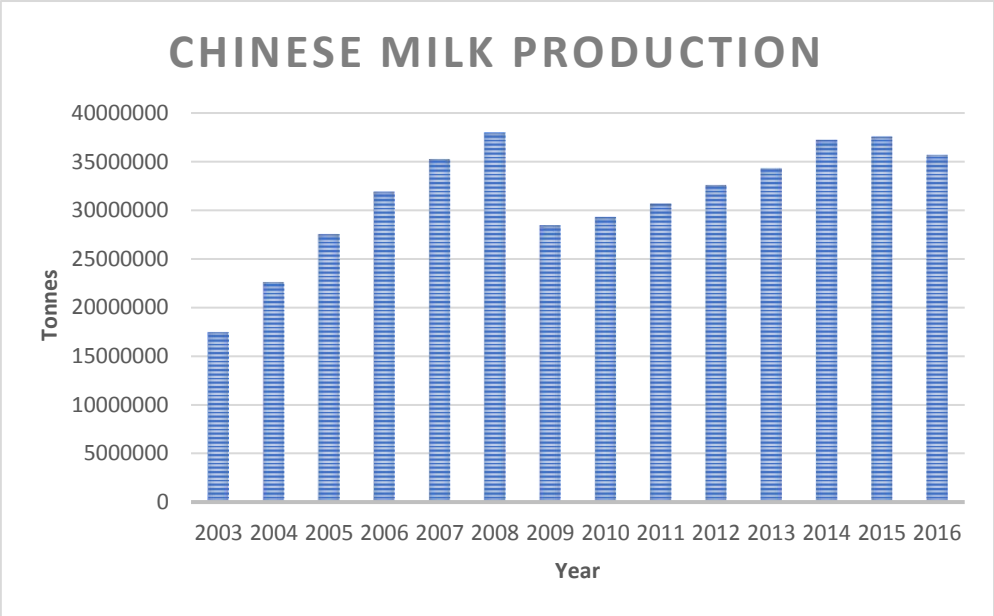

Figure 2: Chinese Liquid Milk production (Wetzel, Dec 31 2003 - Dec 16 2016)

The number of cows milked in China follows a similar trend to that of the global dairy price and Chinese milk production (Figure 3). This shows that the Chinese dairy farmer will increase and decrease the size of the herd in relation to payout quite quickly. This was witnessed on one of my research trips to China where herds were being culled due to the low payments farmers were receiving. At a farm visit to Dairy United in the Inner Mongolian province, the dairy facilities were developed to milk one thousand cows. During my visit in June 2016 they were only milking six hundred

cows. The manager commented that they were financially making a loss and cow numbers diminishing to reduce such losses.

This has led the Chinese farmer to experiment with cross breeding to achieve an animal that can provide either an acceptable milk yield or can achieve returns as a beef animal. There is an emphasis on beef being a part of the dairy animal. (Eckholm, 2015)

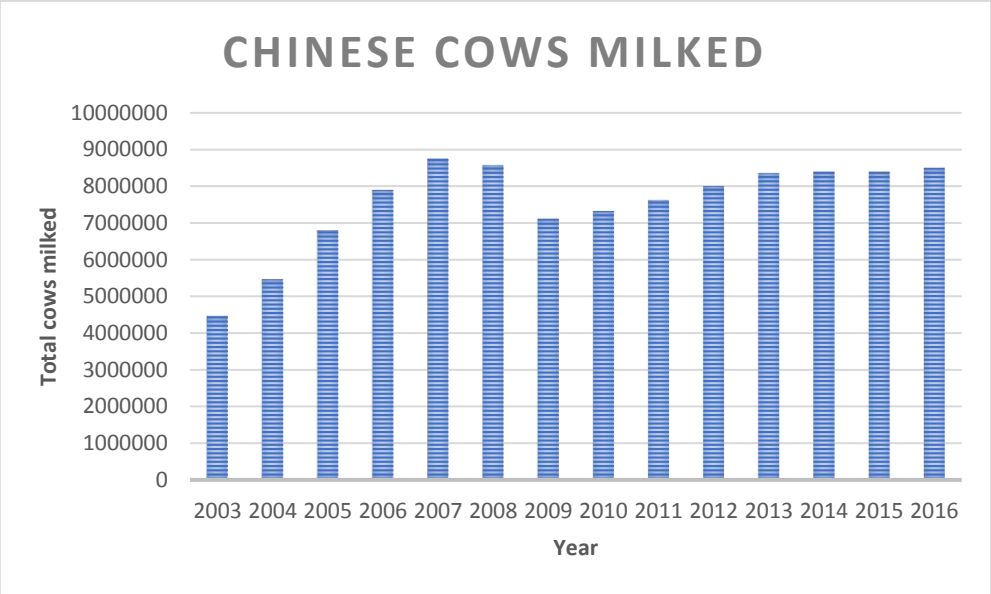

Figure 3: Total cows milked in China (Wetzel, Dec 31 2003 - Dec 16 2016)

This focus on beef being a part of the dairy animal is hindering per cow milk production. In comparison to similar dairy farming systems, the Chinese are producing well below their counterparts (Figure 4). In an interview with Song Liang, (Liang, 2015) he said that there was a focus from China to grow its per cow milk production and by 2020 he envisaged China producing 40 Million Tonnes of consumer branded dairy products internally.

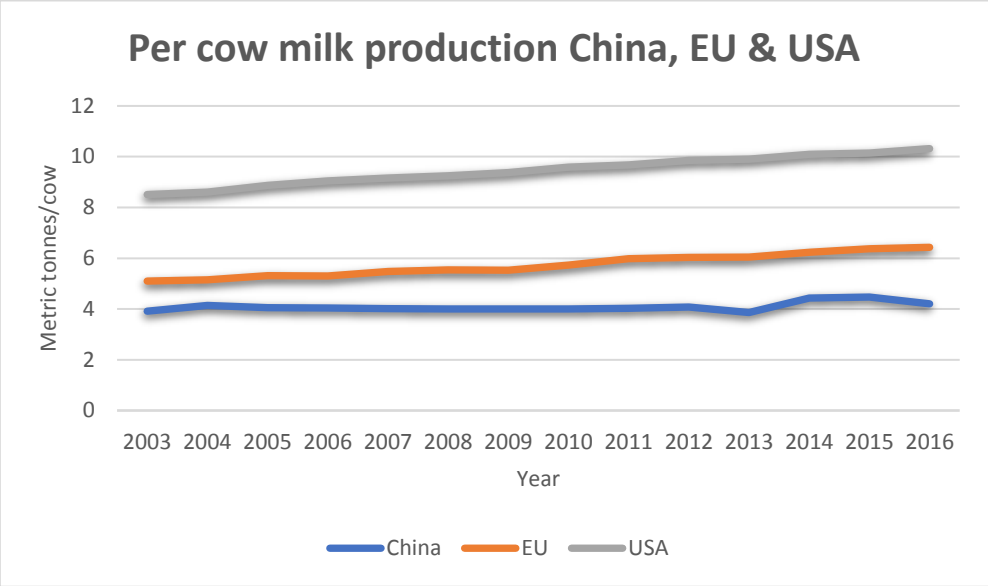

Figure 4: Per cow milk production in China, the EU and USA. (Wetzel, Dec 31 2003 - Dec 16 2016)

That will require enormous effort as Figure 4 shows that the milk production per cow has been stagnant since 2003.

Everywhere I travelled in China, there was an unquestionable need for quality feed. In 2015 there was an estimate made in an interview I had with Dave Eckholm (Eckholm, 2015) of Hayday Farms that the need in China for a quality feed such as alfalfa was 7-9 Million Tonne per year to increase the per cow production. The current supply available was estimated at 2-2.5 Million Tonne per year.

With beef breeding and low volumes of high quality feed going into the Chinese dairy herd, they will struggle to increase their per cow milk yield. Looking at the graph of Chinese Milk Production (Figure 2), some would say that the production of 40 Million Tonnes of liquid milk is achievable. My observation is that the Chinese Dairy Industry will struggle with this target due to low economic return to farmers combined with the lack of quality forage feed available for dairy cows.

11 The effect of demand from China on New Zealand Dairy.

Understanding the production of Chinese Dairy Farmers is important when we consider the effect that the demand from China has had on the New Zealand Dairy Industry in the last fifteen years.

Registered dairy industry bank debt on farm

Year	$ (Million)
2003	$11,290.00
2004	$12,423.00
2005	$13,979.00
2006	$16,112.00
2007	$18,764.00
2008	$24,239.00
2009	$28,982.00
2010	$29,710.00
2011	$29,992.00
2012	$31,113.00
2013	$32,664.00
2014	$34,551.00
2015	$37,746.00
2016	$40,078.00

Figure 5: Detailed Dairy Industry breakdown of debt. (Reserve Bank of New Zealand, 2016)

The New Zealand Dairy Industry has been in a state of expansion due to the growth in demand from markets such as China. There has been a race to supply this growing demand and dairy companies in New Zealand have also expanded alongside their suppliers to fill the gap.

Thus, dairy farmers have gone into increasing debt to grow their businesses (Figure 5.). Rural lenders have also supported this, being encouraged to lend based on the positivity of the demand from emerging markets such as China.

In recent years, it has been common to see New Zealand Dairy farmers implement systems on farm that will allow extra milk production. These often have higher costs associated with them, therefore resulting in compounding debt when global dairy prices fall.

It has not only been dairy farmers investing heavily in

their businesses, but also Dairy processors. Many processors have expanded their current operations by building additional capacity or developing new products that fit the brief of the market. This increased capital investment has been up and down for processors and shareholders/suppliers. The return on these investments is reflected in payout to suppliers. If the return is low, as it has been for commodities recently, so is the payout. This contributes to compounding farming debt levels.

Many Processors have ventured into value added product mixes to gain a higher profit margin to that of traditional commodities. Unfortunately, some of these products have taken longer than expected to return to suppliers. My observations on value added products lead me to believe that there is a significant lag time between development, implementation and return which often isn't factored into the budget when setting up value add projects.

When payout to suppliers is above average, the price of land increases alongside it. This is noted in Figure 6, where we can see the 2008 spike in land price correlate to a Fonterra payout, including dividend, of $7.66 kg/ms (Ninness, 2017) and again in 2014 with a Fonterra payout, including dividend of $8.50 kg/ms (Ninness, 2017).

Land price/ha for Dairy farms in New Zealand

Year	$ (NZD)
2003	$21,794.18
2004	$21,514.00
2005	$26,435.46
2006	$30,524.13
2007	$33,150.13
2008	$39,949.23
2009	$34,706.00
2010	$34,093.00
2011	$33,402.00
2012	$34,385.00
2013	$36,673.00
2014	$39,742.00
2015	$36,557.00
2016	TBA

Figure 6: Land price per hectare for Dairy Farms in New Zealand. (Aitken, 2011) (DairyNZ, 2015/2016)

These increasing debt figures and land prices are of concern as they jeopardise the sustainability of the New Zealand Dairy Industry.

New Zealand dairy exports to China have increased fifteen times since 2003, from $307 Million to $4,592 Million in 2013 (Figure 7). This shows that the growth in demand from China has increased exponentially and explains the focus turning to the Chinese dairy markets from New Zealand Dairy processors.

Value of New Zealand dairy produce exports to China

Year	$ (Million)
2003	$307.00
2004	$349.00
2005	$300.00
2006	$384.00
2007	$391.00
2008	$521.00
2009	$978.00
2010	$1,828.00
2011	$2,172.00
2012	$2,568.00
2013	$4,592.00
2014	$4,326.00
2015	$2,467.00
2016	TBA

Figure 7: Value of New Zealand Dairy exports (Statistics New Zealand, 2016)

As global dairy commodity prices, have decreased in 2015 the value to New Zealand has moved alongside this with the reduction in both value and volume. Although unpublished, 2016 seems to be tracking towards a new normal in terms of Chinese dairy imports.

Going forward, understanding the potential for the future growth of Chinese dairy production will be important to New Zealand, relating to both dairy debt and dairy farm values.

Having moved past an era focusing solely on commodities, New Zealand is learning about its own value added products and only just beginning to realise the need to understand more than the Chinese demand but also the potential for Chinese internal production to meet that demand.

The debt level of New Zealand Dairy Farmers has grown significantly alongside the demand for dairy products from China. The increased value in exports to China between 2008 and 2014 saw New Zealand dairy farmers increase their debt loading to capitalise on this demand. In 2015 the value of dairy exports to China dropped by almost 50%, leading to unsustainable returns for New Zealand dairy farmers. This resulted in debt on farm increasing by $5.5 Billion between 2014 and 2016, as farmers raised debt to remain liquid. Understanding these two factors comparatively provides insight into the importance of the value in dairy exports to China for the New Zealand agricultural sector and economy.

12 Government policy and support.

Until recent times dairy products have not been a part of traditional Chinese diets (Campbell, 2005). The Chinese Government implemented a series of policies designed to expand the dairy sector after the discovery of perceived health benefits from dairy.

The 2000's saw a rapid increase in milk production from Chinese dairy farmers. Market pressures from larger processors on the supply chain, drove smaller processor costs up and problems with manipulation of milk began to appear. This manifested itself with the Melamine scandal of 2008. The ultimate causes of this scandal were in fact poor regulation and fierce competition in the rapidly expanding Chinese dairy industry.

As a result, The Chinese Government steeped in and began to enforce regulations on the dairy industry, similar to other countries around the world. The larger scale dairy farm can sustain such regulatory changes and therefore the pressure has been applied to move towards that style of farming system.

In the interview with Song Liang (Liang, 2015) he said that Chinese Dairy Industry bodies of support were promoting larger scale farming. The Chinese Government may provide subsidies for reaching certain herd sizes, the planting of quality feeds and for the automation of dairy sheds. By automating milk collection methods there was less ability to manipulate the raw milk.

I also discussed the possibility of discounts on fertiliser and a conversion of land subsidy with Mr Liang all of which would be designed to promote China dairy production.

The Chinese Government has a bias towards large scale solutions to issues and favours mega-projects. The dairy industry is not immune to this, which is why there is currently a move towards large scale farms in China.

The Government plays a strong role in primary industries in China. In terms of the dairy industry they now have a strong focus on quality with a move to increase Chinese consumer confidence in domestic products. I see the Chinese Government putting emphasis on both imported and domestic product, but see those products playing different roles within the market. As discussed previously, it is predicted the Chinese consumer will be more confident in domestic product by 2020 and I am sure we will see more fresh, domestically produced products on shelves by then, as the cold chain continues to develop. It is possible imports will be primarily used to fill a gap in supply and be powder based.

Overall, the Chinese Government wants every family to have access to safe consumer dairy products and is under constant consideration of pathways to make this happen for their people.

13 The sustainability of the Chinese dairy industry.

Sustainable dairy production is complex. The Chinese Government's penchant towards large scale farming is intensifying an industry to a point that few have witnessed before now. This intensification may cast doubt over the sustainability of the dairy industry in China.

(DairyNZ, 2013)

To achieve sustainability, a myriad of processes are required to fall into place and sustainability is always a moving target. Even some well-established dairy farming nations are still struggling to find the solution to long term sustainability.

The very basics of sustainability are around animal health and quality feed and water.

Whilst visiting I witnessed some limitations the Chinese will face on their journey to mega farming.

- A shortage of quality feed.

Importing Alfalfa from the USA is not a sustainable long term solution to the feed quality issue that was apparent. China will need to learn to grow their own feed crops for dairy cows. As a nation of traditional gardeners, I believe the skill level is there to do this. I have reservations about the fertility of the soil though, as did some of the counterparts I travelled with through China.

Left: An example of low quality feed being fed to dairy cows as their ration.

David Eckholm estimated the quantity required by China for Alfalfa at between 7 – 9 million tonnes per annum. He estimates that the supply available from Chinese production and imports is currently 2 – 2.5 million tonnes per annum. (Eckholm, 2015)

- A shortage of Farm Management expertise.

China is new to dairy farming. Their farm managers do not have the knowledge to execute the practices required to run a sustainable dairy farm. They are currently seeking to gain this knowledge from countries running systems similar to their own, but this will take time. This was highlighted when I visited the Hebei Dairy Association.

- Environmental practices.

Much is to be learned here. I viewed entrepreneurial ways of dealing with farm effluent, such as worm farming which I saw in Hebei. Each farm was different as to how they dealt with their effluent. I felt there was a disconnect between the dairy farm and the land. A more comprehensive approach would be worthwhile pursuing here.

- Disease.

In 2013 TB was a serious problem in the Chinese national dairy herd and a lot of cows were culled because of this (Mahon, 2015). By 2014 this was deemed to be under control although what methods China was using to do this could not be revealed. China is working on technology and is importing ways to deal with disease risk. In the dairy herd, Foot and Mouth disease is being controlled through vaccination which is conducted three times per annum. The cost associated to this is high and was estimated at between $10-15 USD per injection (Eckholm, 2015). Disease resistant livestock genes are under investigation.

Crop disease is also a risk and subsequently there has been large investment in genetically modified disease resistant crops although not commercially used yet. This will to help combat some of the soil issues such as high saline levels that limit crop growth.

13.1 Industry collaboration with China.

Countries such as The Netherlands have teamed up in Asia to help ensure the knowledge of how to be sustainable is passed on. By working collaboratively within the Chinese dairy industry, I feel they are potentially securing their own market

space into the future. It is no secret that the Chinese value relationships and this is one way to secure them.

Friesland Campina is currently running a dairy development programme which teaches farm managers the fundamentals of running a housed dairy farm.

In 2015 New Zealand announced it would work on research projects with China. These projects include …

- Improving water use efficiency and quality, while reducing the water footprint of dairy farm systems in China and New Zealand.
- Integrating tracing technologies for dairy products to give consumers and international markets confidence in the safety of dairy foods.
- Investigating nutrient cycling and grassland legumes in alpine grasslands on the Tibetan Plateau and in New Zealand high country, to improve the economic sustainability of farms.

“These projects join four others that began in 2014 and contribute to a five-year programme supporting collaborative projects agreed by NZ and China.”

2015 New Zealand Science and Innovation Minister Steven Joyce was quoted as saying “They will bring together top international researchers with the potential to drive economic growth through the development of new technologies and strengthened links to expanding markets. They will also help to shape our increasingly innovation-led economy.” (New Zealand Government, 2015)

14 Markets in China.

Whilst visiting China in 2015 and 2016 volatile dairy pricing faced the world. Visiting China I could see that it was a large population of people to feed and pondered why they were not absorbing the worlds surplus of dairy products. An understanding of

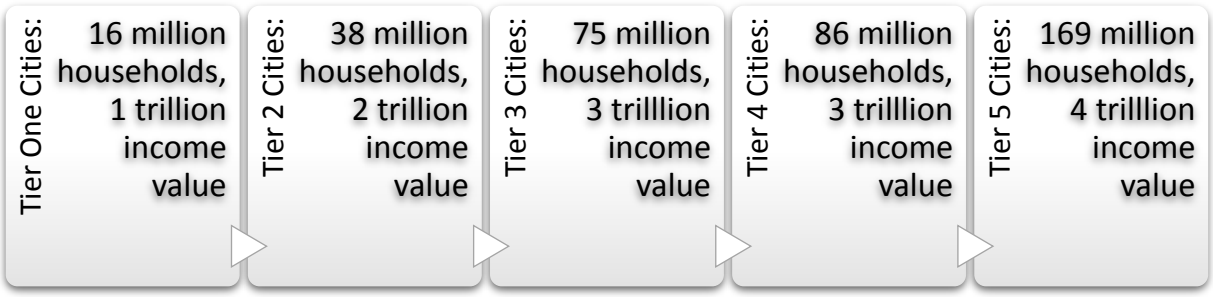

Figure 8: Number of households and income values of tier cities in China. (Nexus Pacific, 2013)

how China's cities are grouped into tiers is essential for navigating markets, understanding consumer behaviour, income level, and local trends, therefore enabling companies to tune their strategies to suit local conditions.

Based on the above information, you may think there is easy market potential in lower tier cities. These are spread out across China, making them more difficult to access than the Tier 1 megacities. Due to the differing nature of the tiers, consumer habits, lifestyle and disposable income vary across this spectrum.

It was while interviewing Song Liang (Liang, 2015) that he pointed out that the current demand was still in an introductory phase and demand was more related to forming habits around consuming dairy products.

The more affluent tier 1 and 2 cities were demanding dairy products and having that demand fulfilled by quality imported products. The growth is coming from tier 3 and 4 cities and the price for dairy products has been too high until recently, which has

prevented demand from growing. Now price is more affordable for these people demand is increasing.

The difference in the development of a cold chain network between 2015 and 2016 was noticeable. My visit to Sunjock Dairy highlighted this with Li Yimin also acknowledging the fact, with his business' rapid expansion into the fresh milk market from UHT, supported by the reliable cold chain. Large dairy processors can now transport raw milk and finished chilled products further afield, which will change the way dairy products are made and sold internally in China. Retail visits provided valuable insight into markets in China. The difference between my 2015 and 2016 visits showed the progression of European products into the Chinese supermarkets. The presence of Dairygold butter from Ireland had expanded greatly.

15 EU Quota lift and markets moving forward.

During my studies I was in Ireland when the EU lifted the quota on milk supply on 1 April 2015. The EU was growing supply pre-quota repeal with the knowledge that the quota was going to be lifted at this time. Post quota lift there has been a substantial increase in milk supply. The difference of 13 Million Tonnes between 2012 and 2016 is equivalent to over half of New Zealand's milk production (Figure 9). Large proportions of this product have entered the international market as demand has remained relatively stagnant within Europe itself.

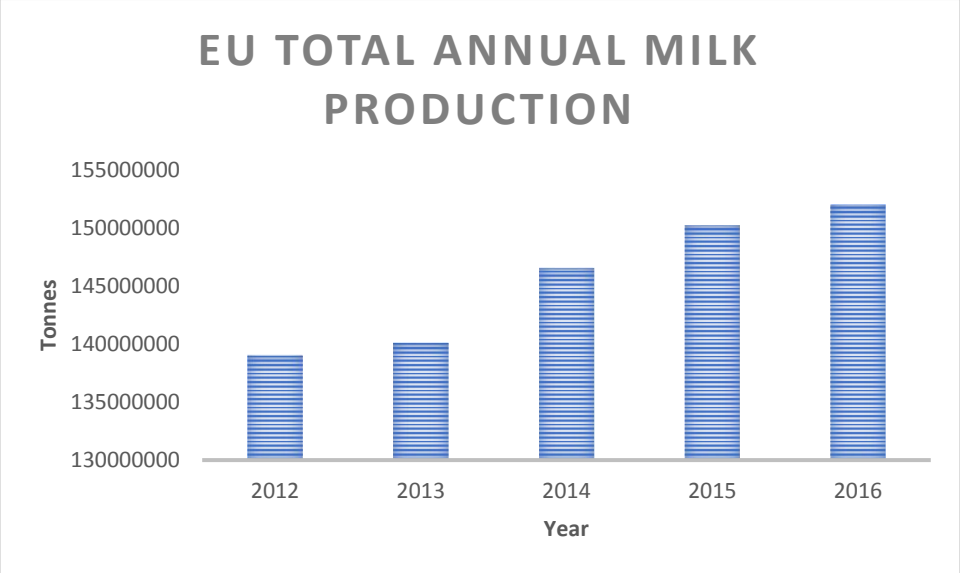

Figure 9: Total EU annual milk production. (Wetzel, Dec 31 2003 - Dec 16 2016)

This has contributed to a significant drop in global dairy prices. The EU has also been seen to be actively competing in markets that New Zealand operates in which includes China.

In several European countries, domestic product is often sold at a premium to allow the sale of product internationally at a more competitive price. New Zealand's ability

to achieve a premium on our dairy products in export markets, has been affected and is more than likely to continue to be so.

The security and branding of European products is providing the same quality and standard of assurance as those produced in New Zealand. The marketing campaign from Bord Bia (Irish Food Board) called Origin Green could be mistaken for campaign material from New Zealand as seen in the two following photographs.

New Zealand will need to significantly differentiate from such campaigns to communicate a real point of difference with their customers.

Above: A screenshot from the Origin Green promotional video.
Link: https://www.youtube.com/watch?v=ZGvKoz8FP5o

Below: A screenshot from The NZ Story promotional video. Link:
https://www.youtube.com/watch?v=XH8GMA_Q8m4

16 New Zealand trade relationships.

In 2015 I heard a lot of commentary about how New Zealand was viewed as a strong partner for China within the dairy industry. Upon return in 2016 there seemed to be a greater connection with the dairy industry in Europe. An observation from a respected person with a voice from within the Chinese dairy industry was that the New Zealand dairy industry had an arrogance about it and people at high levels were not willingly accessible. China was building relationships with Australia, the EU and USA to fill the gap that New Zealand had previously held.

Another undisclosed commentator said that there has been a lack of good communication between China and New Zealand. They said that New Zealand does not understand Chinese structures and consumer demand and mistakes have been made.

When asked about Global Dairy Trade (GDT) I was told that it has been a source of great dissatisfaction for the Chinese because it didn't account for long term pricing relationships with customers. Building strong relationships is key to any successful business dealings in China. China felt that GDT did not help cement future investment and growth when dealing with New Zealand companies.

The good trade relationship stories were often heard when long term, mutually beneficial relationships were established. All parties felt like they were equals and due diligence conducted so each party understood their role within the relationship.

As New Zealand works toward expanding the current Free Trade Agreement they must acknowledge the importance of building relationships. These relationships are pivotal to success for all parties. I witnessed this first hand when on my second visit

to China meeting with Liu Kai from Sino Dutch Dairy Development Centre. He said that he now considered our relationship as more than a commercial interaction and would appreciate the courtesy of meeting again during any future visits I had to Beijing.

17 Changes on farm between visits to China.

Throughout the time between my visits to China I observed a marked change in the expected prosperity of Chinese dairy farmers. There was a confidence that global dairy prices would return enabling the Chinese dairy farmer to be profitable.

In 2015 when I visited there was little concern over the length of a downturn, with many believing recovery would be seen in the fourth quarter of 2015.

When visiting China again in 2016, the focus of Dairy had changed to the environment and how the Chinese dairy farms would fit within an urbanised population. An example of this was when visiting Sunlon Livestock in Beijing. It was evident that the urbanised population was going to engulf the surrounding area of the farming operation within the next two years.

Dairy effluent was top of the list of environmental concern, with many ways being explored around how to deal with this. It was raised by Chen Bing, Yuman Liu and Dou Ming during my 2016 interviews.

It had become accepted that the market place would dictate the outcome for small farmers and poorly run farms in respect to the environment.

18 The next five years for China dairy.

The question that concerns me as a dairy farmer is will the demand from China for New Zealand's dairy produce continue at the same level and will China's internal growth of dairy production be responsible for reducing that demand? This means we must look forward and look at possibilities that will see this production grow and try to understand triggers influencing production in China.

Observing whether China will increase internal production firstly centres on their farmers getting paid above cost of production for their milk. Cost of production varies across Chinese farming operations. The best indicator that costs are exceeding production is often represented by a drop in overall milk production. This was seen in 2016 when milk production in China dropped by 4%. When commodities prices are low, farmers in China will respond by reducing inputs leading to reduced milk production. Per cow production for 2016 dropped by 0.27 metric tonnes.

China milk production will grow if milk commodity prices improve and from conversations this figure requires whole milk powder prices to remain above $3000US per tonne for the Chinese farmer to achieve a return that exceeds the cost of production. The Chinese Government is keen to see their farmers achieve this and will help wherever they can, however evidence suggests that they are not keen to interfere for long periods.

Going forward we must recognise that commodity prices will be the biggest influence on internal growth of Chinese milk production.

Consideration is currently being given to the environmental effect large scale dairying is having in China (The Japan Times, 2016). When meeting with various

dairy commentators in 2016, they all identified environmental concerns as being a future restriction on production growth. Some large farms have succeeded in eliminating these concerns, but they are the exception rather than the norm. The Fonterra Chinese Farms were an example of this, with Alan van der Nagel recounting the journey Fonterra had with returning manure to pastures and the local farmers seeing the value from this.

The Chinese government is committed to improving all aspects related to the environment. The dairy industry will be no exception. The greater Chinese population is demanding improved living conditions, including the quality of water and air. One commentator noted that the Chinese government will always recognise what their population is concerned about and implement policies that will deliver results reducing the people's concerns as a part of being a successful one party state.

Recent discussions to alleviate concerns around the environmental effects of dairying in China, the mega farms (over 1000 cows) will not be supported by the Government in the future. The development of 300 to 500 cow farms with a more family based management and ownership structure will be favoured (The Japan Times, 2016). By doing this the Government is hopeful that detrimental environmental effects will be lessened as the people running the farms will have an integrated approach by being more closely connected to the farm.

Forging a connection between farmers who supply the feed for dairy animals is another hurdle to growing Chinese milk production. Much of the dairy cow feed was poor quality and often what New Zealand farmers would call dry cow feed at best. Some local farmers take the dairy effluent and spread it on their fields to increase the

productivity of feed crops creating a synergistic system but that was rare. The problem identified by Frank Gibson (Gibson, 2015) and Xavier Naville (Naville, 2015), with the work that they had done around soils in China, was that poor organic matter levels in the soil were the major issues causing poor yields for feed crops.

By effectively utilising dairy effluent on the soils then feed crop yields will improve along with the grass quality being used in silage making. Improvement in feed quality will lead to increased production. The observation of utilising dairy effluent alongside the environmental concerns raised, I believe a solution of spreading dairy effluent effectively can grow Chinese milk production.

The quality of the Chinese dairy herd is a limiting factor when considering milk production. The overall quality of the dairy herd in China is slowly improving but per cow production for animals in a housed system is well below that of other countries operating similar operations. Breeding more efficient cows will take time and efforts are being made in this area. Dairy herds around the world are increasing their per cow production and this will also occur in China.

Dairy management on farm is another challenge China is currently facing.

The Chinese do not have generations of animal husbandry in their DNA and have found it challenging to move into dairy management easily. Educational activities to help improve on farm management are available and encouraged, but not always easily accessible. Improvements in dairy management will have a positive effect on dairy production.

The traditional Chinese farmer is a gardener who until recently was very concerned with growing enough to feed his family and producing a little extra to sell enabling the purchase of other essentials –

David Mahon; Managing Director, Mahon China Investments

19 Future Chinese Dairy Production.

I have considered the many conversations had and the readings undertaken as part of this study including the White paper on China Dairy (Kai, 2014) and the Global Meat Complex: The China Series (Rou, 2014), along with my own personal observations.

In my opinion, milk production in China will stagnate at between 35 and 37 million tonnes for the next two years as the returns to farmers recovers slowly and some environmental concerns are dealt with. Following these two years', growth will return and milk production could exceed 40 million tonnes by 2021 however a lift in commodity prices will be required for this figure to be achieved otherwise production will stay at current levels.

To achieve this a combination of factors including improved feed quality, cows and management must be implemented. When considering the size of the Chinese dairy herd at 8.5 million cows in 2016, it will only take small improvements across these three areas for per cow production to increase to around the 4.7 tonnes per cow (Figure 4) while maintaining the same cow numbers for 40 million tonnes to be reached.

When looking at these figures we should have some confidence, even though the internal production in China will grow, so will the demand for dairy products from the Chinese consumer (Rou, 2014). This should ensure steady demand for imported dairy products in the future. New Zealand needs to spend the time to ensure the relationships and story are exemplary to ensure New Zealand dairy is a big part of these imports.

20 Conclusions.

The importance of China to the New Zealand dairy industry has never been greater, especially when taking into consideration the debt held by New Zealand dairy farmers. New Zealand must work hard to maximise the relationship with China and ensure they are a valued partner for the Chinese dairy industry rather than just a supplier of goods.

As a dairy farmer in New Zealand, I used to gain my views on what is happening in China from New Zealand based commentary. Once in China, I found that what was happening wasn't the story being reported.

The New Zealand dairy industry has invested heavily to meet a supposed ever growing Chinese milk demand. We are now experiencing the pain of low commodity prices caused by increased milk flow outside of New Zealand into China. In future, any large expansion across agricultural sectors such as the recent dairy investment, should be accompanied by much greater research and risk evaluation of factors that could influence returns to the New Zealand farmers.

Dairy farmers in New Zealand require sustainable returns on investments and must be well informed and aware of risks before further development. The rush to produce milk in New Zealand over the last 15 years has caused many farmers financial stress and in many cases this has compounded over the last 2 years. Being more thorough with risk analysis, the dairy industry will be better placed to inform dairy farmers, thus reducing stress, and enabling sound planning on farm.

New Zealand needs to differentiate from other export countries that are trying to gain market share in China. As the Chinese consumer becomes more discerning, New

Zealand will need to look for avenues to increase the value of products through this differentiation.

21 Recommendations.

- To achieve differentiation to other export nations, New Zealand will need to declare all agricultural produce free from genetic engineering (GE).

  By doing this New Zealand can become market leaders for the discerning Chinese consumer.

- The New Zealand dairy industry must look at monitoring the Chinese milk production and its changes more closely. This will enable a better view to risks that could affect New Zealand.

  More due diligence is required around China dairy production statistics. This data needs to be transparent across all dairy companies and be widely available.

- New Zealand must invest in relationship building with a long-term view to match that of Chinese relationship ideals.

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23 Appendix.

23.1 Interview Questions

Nuffield research interview questions

1 What do you perceive to be the current limitations to dairying in China today?

2 How will each of these limitations effect future growth?

3 What is being done to are you aware of being undertaken to rectify these limitations?

4 Do you believe the Chinese consumer has truly embraced locally produced dairy products as part of their diet? If so, why? If not, why not, and when do you believe this will happen and why?

5 Will outside investment grow China dairy? How and why?

6 What are the main characteristics of growth in internal milk production in China Today?

7 Why do you think this is the current production level?

23.2 Interviewees

Alan van der Nagel, (May 2016) Managing Director, Fonterra International Farming Ventures (B. O'Connor, Interviewer)

Alex Worker, (May 2016) Marketing and Communications Strategy Manager, Fonterra International Farming Ventures (B. O'Connor, Interviewer)

Chen Bing, (May 2016) Chief Dairy Economist, Beijing (B. O'Connor, Interviewer)

Dave Eckholm, (April 2015), CEO Asia Operations; Hayday Farms. (B O'Connor; Interviewer)

David Mahon, (April 2015, May 2016) Managing Director; Mahon China Investments. (B. O'Connor, Interviewer)

Dou Ming, (May 2016) Senior Economist, Beijing Orient Dairy Consultants (B. O'Connor, Interviewer)

Frank Gibson, (April 2015). Partner, Vision Management Consultants Limited; Shanghai. (B. O'Connor, Interviewer)

Li Yimin, (May 2016) Chairman, Sunjock Dairy, Luohe; Henan (B. O'Connor, Interviewer)

Liu Kai, (April 2015, May 2016) Manager, Sino Dutch Dairy Development Centre (B. O'Connor, Interviewer)

Ming Chou, (April 2015, May 2016) Investment Manager; Mahon China Investments (B. O'Connor, Interviewer)

Sharon Lucock, (March 2016) Lecturer in Agribusiness Management, Lincoln University (B. O'Connor, Interviewer)

Shi Yan, (April 2015) Shared Harvest Farm, Beijing (B. O'Connor, Interviewer)

Song Liang, (April 2015). Independant Dairy Analyst. (B. O'Connor, Interviewer)

Xavier Naville, (April 2015). Partner; Vision Management Consultants Limited.

(B. O'Connor, Interviewer)

Yuman Liu, (May 2016) Professor of Rural Development Institute, Chinese Academy of Social Sciences (B. O'Connor, Interviewer)