



IUF Dairy Division



New Zealand Dairy Industry

Abstract

With annual exports volume of NZD\$11 billion and contributing to approximately 25 percent of total merchandise export earnings, New Zealand remains the largest exporter of dairy products. New Zealand dairy products account for around one third of the international dairy trade. The evolution and performance of the NZ dairy industry is strongly shaped by a number of key factors including favourable endowment of natural resources for grass production and farmers' strong ideology towards control and ownership of downstream manufacturing and marketing activities, which led to vertical integration and continuous organisational changes. The key strengths of New Zealand's dairy industry include its all-grass farming system, large-scale processing and high levels of investment in research and development, which have increased the efficiency while maintaining the quality of dairy production. The dairy industry is one of New Zealand's largest and best examples of a vertically integrated, co-ordinated global supplier industry. Although New Zealand only accounts for two percent of world dairy production, the country exports over 95 percent of all its national production. This is in sharp contrast with the global trend where around 95 percent of total dairy production is usually consumed within the country of origin. About half of New Zealand's recorded dairy exports are value-added products and New Zealand's total export value for dairy has significantly increased between 2006 and 2009. New Zealand's top dairy export destinations are the United States, China and Japan.

While New Zealand's economy is heavily dependent on the dairy industry in terms of both output and employment, New Zealand is acknowledged as the country with the least subsidised farm sector among the industrial nations, and has been complemented by the OECD that its dairy sector reforms "resulted in a dramatic reduction in market distortions." New Zealand's dairy products range from high quality basics including milk powders, butter and cheese, through to specialty foods such as ice cream, and to highly specialised ingredients like protein hydrolysates and freeze-dried biologically active proteins. In recent years, development of functional foods is a growing trend in New Zealand's dairy industry, and the developed products include low-fat, high calcium and protein milk, and biomedical and biohealth products. On the other hand, although the New Zealand dairy industry is relatively successful, it is nonetheless facing a number of challenges. These challenges include declining fertility and increasing levels of mastitis amongst NZ dairy herds, environmental resource issues such as competition for water resources, a lack of capital structure required to fund global growth, and the need to sustain research programmes. In order to address these issues, industry strategies need to be implemented at all levels, ranging from farm system upgrades to adjustments in government regulations.

Background Information ^{1 2 3}

With annual exports volume of \$11 billion and contributing to approximately 25 percent of total merchandise export earnings (\$NZ10 billion in 2008-09), the dairy industry is New Zealand's biggest export earner. New Zealand dairy products account for around one third of the international dairy trade, and New Zealand remains the largest exporter of dairy products. The key strengths of New Zealand's dairy industry include its all-grass farming system, large-scale processing and high levels of investment in research and development, which have increased the efficiency while maintaining the quality of dairy production, as well as creative marketing strategies.

Dairy industry makes a large and growing contribution to the New Zealand economy. New Zealand has historically depended on the primary sector for its economic growth. Projections suggest that the pastoral and related food industries will remain at the core of the New Zealand economy through to 2020. On the back of continued growth, the dairy sector is forecast to grow export revenue to \$11.9 billion in 2012, helping to lift the New Zealand economy out of the global recession.

New Zealand's dairy products range from high quality basics including milk powders, butter and cheese, through to specialty foods such as ice cream, and to highly specialised ingredients like protein hydrolysates, spray-dried milk proteins, and freeze-dried biologically active proteins. Also, there is a growing trend of developing new functional foods using dairy ingredients. Examples of these functional foods include low-fat, high calcium and protein milk, biomedical and biohealth products. In recent years, development of functional foods is a growing trend in New Zealand's dairy industry, and the developed products include low-fat, high calcium and protein milk, and biomedical and biohealth products, such as colostrum-based health supplements. Below are some key statistics for New Zealand's dairy industry (as of 2009):

Annual Export Volume	NZD\$11 billion (≈EUR\$6.75 billion as of Aug 2011)
Annual Production	16 billion litres
Proportion of national produce exported	95%
Share of world dairy production	2%
Share of world trade in dairy products	35%
Number of dairy farms (2005 data) ⁴	12,810
Dairy cows	5.8 million
Milking herds	4.6 million

Historical Background to NZ Dairy Industry ⁵

The New Zealand dairy industry has grown considerably during the last three decades (see Table 1 and Table 2). This period of expansion (1980-2006) was built on a well established industry. The evolution and performance of the NZ dairy industry is strongly shaped by the following key factors.

- Favourable endowment of natural resources for grass production.
- On-going pursuit for innovation and technological improvement by stakeholders.
- Early access to guaranteed market (UK).
- Farmers' strong ideology towards control and ownership of downstream manufacturing and marketing activities led to vertical integration and continuous organisational changes.
- Traditional market access challenged by UK joining EU drove search for new markets and market diversification and ongoing development of global network of NZDB and Fonterra subsidiaries overseas.

At first dairy production was mostly aimed at the domestic markets with some exports to Australia slowly developing. Once refrigeration technology became available, the UK is the major overseas outlet for NZ dairy commodities. The first NZ brand established in the UK was Anchor in 1919. Butter and cheddar cheese were the main products exported to this market until 1973.

Trade slowed down when UK announced it would join the EC. The threat of increasing trade barriers motivated the NZ dairy industry to explore South East Asia and to seek diversification of products. Ongoing growth in trade with South East Asia was based on milk powder and reconstitution of milk powder in consumer products. Initially the strategy is based on recombining milk powder in NZ owned plants overseas. This strategy proves unsuccessful and is changed to selling milk powder to local companies.

<i>Year</i>	<i>Total Dairy Cattle</i>	<i>6 Year Change</i>
1974	3,074,000	
1979	2,900,089	-5.7%
1984	3,245,524	11.9%
1989	3,303,377	1.8%
1994	3,839,184	16.2%
1999	4,316,409	12.4%
2004	5,154,092	19.4%

Table 1. Total NZ Dairy cattle

<i>Season</i>	<i>Milkfat processed (million kgs)</i>	<i>Milksolids processed (million kgs)</i>	<i>Protein processed (million kgs)</i>	<i>Milk processed (million litres)</i>
1974/75	244	425	181	5,222
1980/81	282	491	209	5,868
1985/86	350	609	257	7,326
1995/96	452	788	335	9,325
2005/06	724	1,267	543	14,702

Table 2. Summary of milk production on selected seasons

Trade ^{6 7}

As previously mentioned, New Zealand is a major player in world dairy markets and has a significant role in the world's dairy trade. Although New Zealand only accounts for two percent of world dairy production, the country exports over 95 percent of all its national production. This is in sharp contrast with the global trend where around 95 percent of total dairy production is usually consumed within the country of origin.

About half of New Zealand's recorded dairy exports are value-added products, yet it is estimated that this value may be even higher due to processing and packaging of value-added products in New Zealand owned offshore operations. New Zealand's total export value for dairy has significantly increased between 2006 and 2009 on the account of growing milk solids production, higher export prices and a diverse range of export destinations (see Figure 1 for New Zealand's dairy export volume comparison). Out of the destinations, United States, China and Japan receive the greatest volume of New Zealand dairy exports. Six main categories of dairy products are exported from New Zealand, including:

- Milk and cream (not concentrated)
- Milk and cream (concentrated)
- Buttermilk and related products
- Whey and related products
- Butter and related products
- Cheese and curd.

New Zealand is the world's largest butter exporter and accounts for over 40 percent of all internationally traded butter. Skim and whole milk powders, on the other hand, contribute around 27 percent and 38 percent respectively. ⁸ Out of New Zealand's exported dairy products, concentrated milk (particularly whole milk and skim milk powder) is the largest product category, with a value of around NZD\$4 billion (2009 data). Cheese and curd is currently the second most important product category, having taken over from butter. Although declined in relative importance, butter remains the third most important category. Non-concentrated milk, buttermilk and whey products are smaller categories; however whey products have increased in importance in recent years.

As illustrated in Figure 2 the dairy industry in New Zealand can be separated into three broad value generating activities: ⁹

1. dairy farming;
2. manufacturing and distribution; and
3. exporting - incorporating the marketing and distribution to overseas markets

The first value generating activity in the dairy industry - the production of milk at the farm - includes the full range of animal and plant husbandry, milk harvesting and business management. The final stage in the New Zealand dairy value chain is the international marketing of NZ dairy products.

Figure 1. New Zealand Dairy Export Volume Comparison (Jan-May 2006-2011)
(+/- % on the same period of previous year)

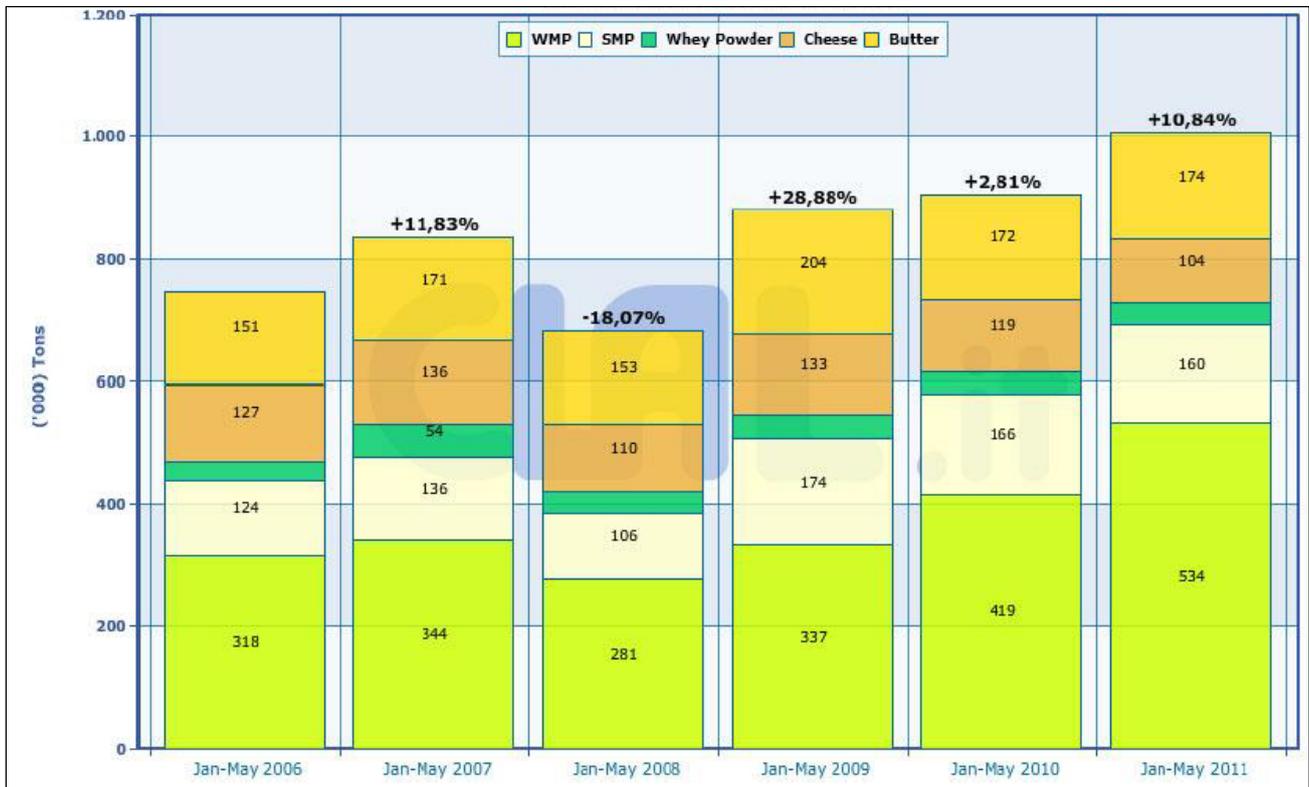
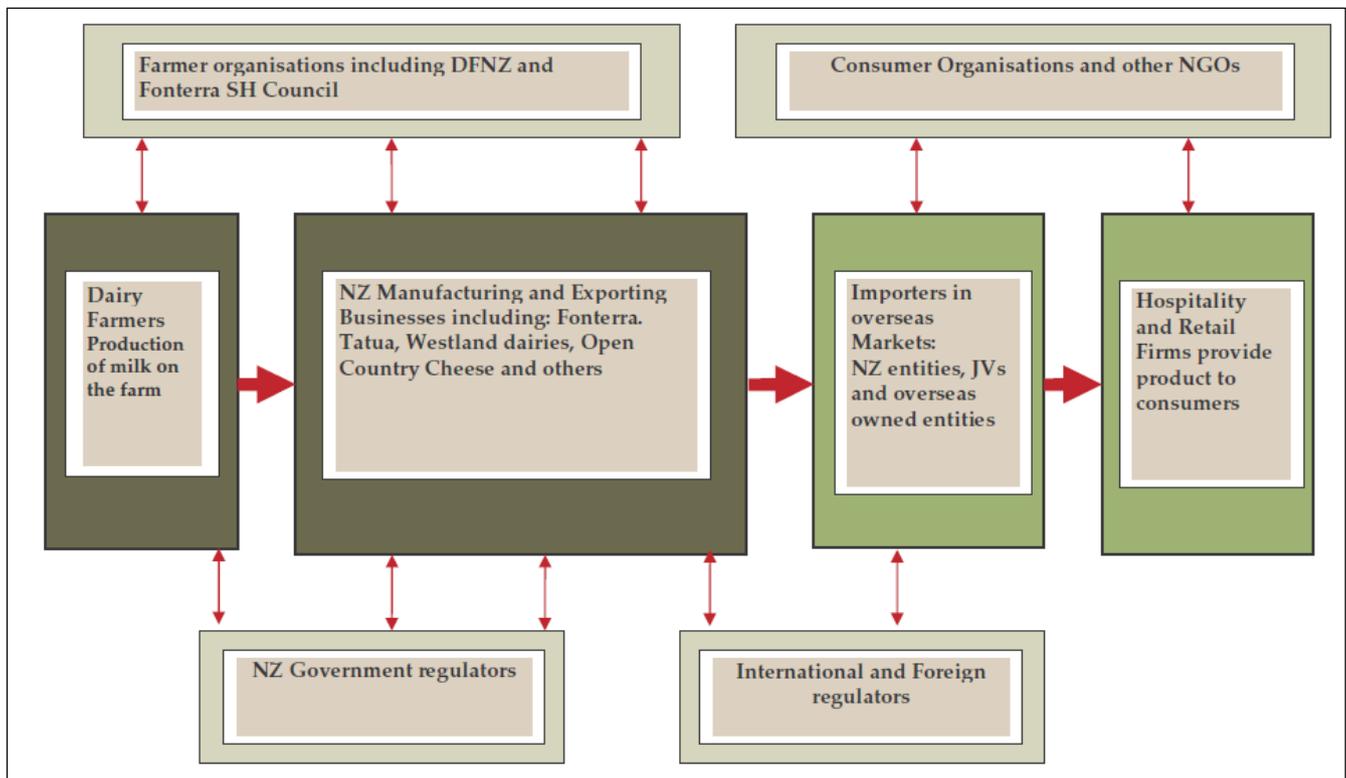


Figure 2. The New Zealand export dairy value chain (as of 2007)



Key Players and Ownership

Zero government subsidies ¹⁰

While New Zealand's economy is heavily dependent on the dairy industry in terms of both output and employment, New Zealand government does not provide subsidies for the dairy sector at all. In 1984 New Zealand's Labour government took the dramatic step of ending all farm subsidies, which then consisted of 30 separate production payments and export incentives. Prior to the reform, subsidies in New Zealand accounted for more than 30 percent of the value of production and New Zealand farming was also marred by issues including overproduction, environmental degradation and inflated land prices.

Yet the subsidy elimination in New Zealand was swift and sure. New Zealand's government simply offered one-time "exit grants" to those who wanted to leave farming when subsidies ended. This plan was initially met with protest marches on parliament and organized resistance by farmers, and the government predicted that 10 percent of all the country's farms would go out of business.

However, a report in 2001 provided by the country's main farmers' group, the Federated Farmers of New Zealand, documents the positive change and growth in that country's agriculture industry since subsidies ended. While land prices initially fell after reform, by 1994 they had rebounded, and they remain high today. The mass of farm bankruptcies some had expected never occurred; only 1 percent of farms have gone out of business. Meanwhile, the value of farm output in New Zealand has increased 40 percent in constant dollar terms since the mid-1980s. Agriculture's share of New Zealand's economic output has risen slightly, from a pre-reform 14 percent to 17 percent in 2002. After the reform, productivity in the industry has averaged 6 percent growth annually, compared with just 1 percent before reform.

Forced to adjust to new economic realities, New Zealand farmers cut costs, diversified their land use, sought non-farm income opportunities and altered production as market signals advised. For example, by reducing sheep numbers and boosting cattle ranching. Farmers were aided on the cost side as input prices fell, because suppliers could no longer count on subsidies to inflate demand. The striving for greater efficiency also supported environmental protection as marginal land farmed only to collect subsidies was replaced with native bush, and overuse of fertilizers ended when fertilizer subsidies were removed.

The Organization for Economic Cooperation and Development (OECD) confirms that New Zealand has the least subsidised farm sector among the industrial nations, concluding that its reforms "resulted in a dramatic reduction in market distortions." The OECD's data show that agriculture subsidies account for just 1 percent of the value of agriculture production in New Zealand and consist mainly of scientific research funding. By contrast, subsidies represent 22 percent of the value of U.S. farm production.

Processing Companies ^{11 12}

There are seven main dairy processing companies in New Zealand, with Fonterra Cooperative Group being the largest, accounting for 90 percent of the country's milk supply, more than 20 percent of total New Zealand merchandise exports, seven percent of the country's Gross Domestic Product and 40 percent of the domestic consumer market. There are two other co-operatives, Tatua Co-operative Dairy Company Ltd and Westland Milk Products. There are also four other processing companies, namely Open Country Dairies, Synlait, New Zealand Dairies and Goodman Fielder. For these companies, over 95 percent of processing capacity is farmer-owned

Regulating Fonterra- The Dairy Industry Restructuring Act ¹³

Fonterra, New Zealand's largest dairy company was created and regulated by The Dairy Industry Restructuring Act (DIRA) in 2001. This Act provides for the regulatory and structural reform of the dairy industry. The DIRA authorised the amalgamation of New Zealand's two largest dairy co-operatives, New Zealand Co-operative Dairy Company Ltd and Kiwi Co-operative Dairies Ltd, into Fonterra Co-operative Group Limited (Fonterra). Consequently, all the shares in the New Zealand Dairy Board are now owned by Fonterra.

As this resulted in an entity with a substantial degree of market power in a number of key domestic New Zealand dairy markets, the DIRA was designed and implemented to mitigate the risks of Fonterra's market power. The DIRA allows for contestability in the New Zealand raw milk market and provides for access to other dairy goods or services supplied by Fonterra to be regulated if necessary. This contestability and access is provided under Subpart 5 of Part 2 of the DIRA by the following clauses:

- legislating open entry to and exit from Fonterra by farmers;
- allowing shareholders (dairy farmers) to supply 20 percent of their weekly production to an independent processor
- ensuring that, at any time, at least 33 percent of the milksolids produced within a 160 kilometre radius of any point in New Zealand is supplied either under contracts with an independent processor, or under contracts with Fonterra that expire (or may be terminated without penalty) at the end of the current season
- ensuring that Fonterra sells at market value to exiting shareholders any milk vat situated on their farm, when requested by those shareholders
- preventing discrimination between new entrants and existing shareholders

Industry Structure and Regional Strengths ^{14 15}

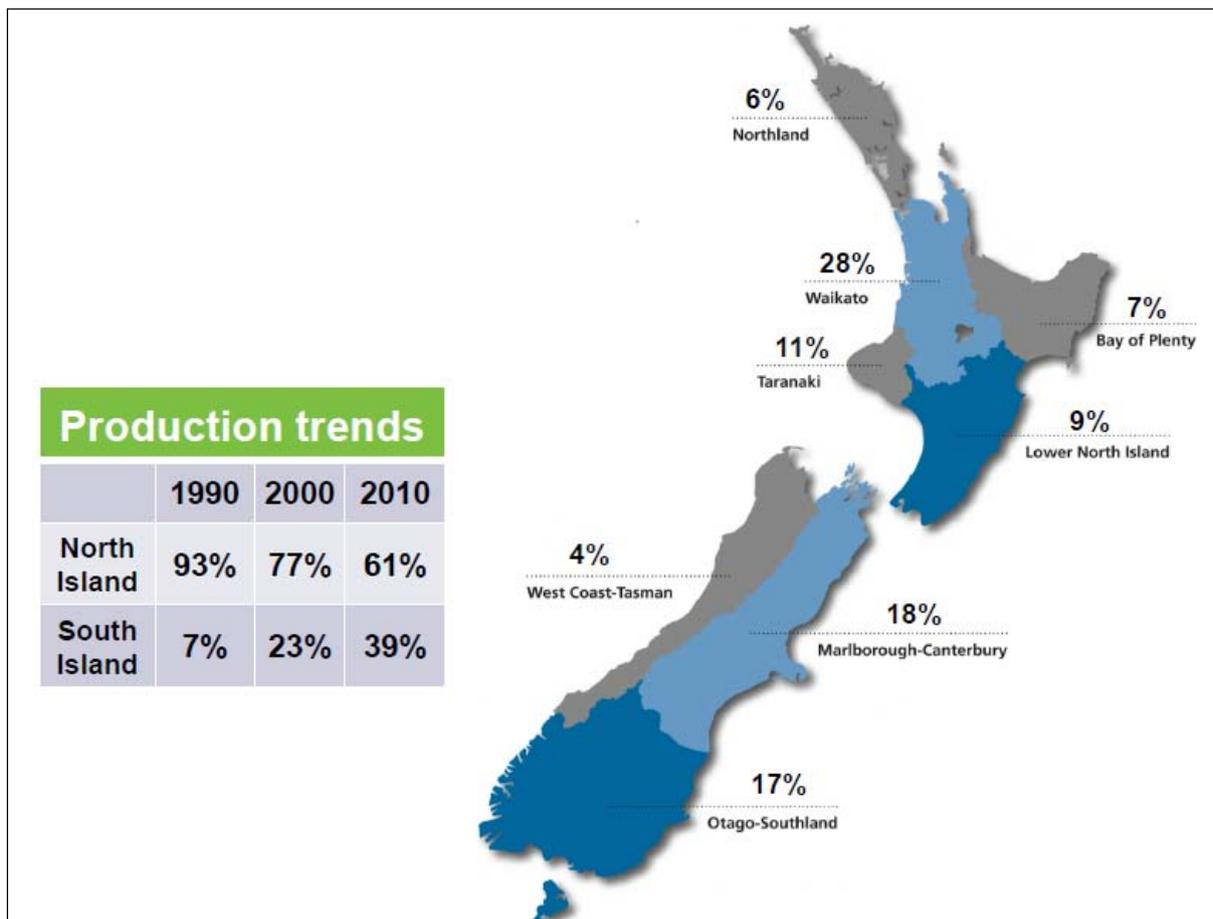
Industry structure

The dairy industry is one of New Zealand’s largest and best examples of a vertically integrated, co-ordinated global supplier industry. The dominant players include Fonterra, Tatua and Westland. New players, for example, Open Country Cheese based in eastern Waikato, sources milk from local farms to produce premium quality cheese and whey powder exported around the world. Outside of the milk processing companies, there are hundreds of specialist dairy product companies exporting niche products.

Regional strengths

81 percent of New Zealand’s dairy farms are located in the North Island, with one-third of the country’s total located in the Waikato/South Auckland region. Taranaki is the second most populated region at 16 percent. South Island dairy farms account for 19 percent of the national total. Other specific regional activity includes a cluster of dairy sheep farmers in Otago and Southland, which is focusing on three key areas, including producing sheep milk for cheese plants such as Whitestone Cheese (added-value sheep milk cheese), feta cheese production and biotech applications. A dairy education and innovation centre in the Manawatu also offers specific graduate training for the dairy industry by Massey University in conjunction with Fonterra. See below for New Zealand’s milksolids production by different regions.

Figure 3. New Zealand Milksolids Production by Region ¹⁶



Products and Innovation

Innovation and invention ¹⁷

A number of innovations resulted from the activities of New Zealand's dairy industry. Examples of these efforts include:

- Formation of partnership between Fonterra's Anlene bone nutrition group and a leading healthcare company, GE Healthcare, to work on bone health issues using Anlene products and GE's bone mineral density technology.
- Achieving a world-first by breeding cows that produce low-fat milk that is also high in omega3 oils and polyunsaturated fat. The cows were bred from a single female discovered by researchers to have a particular genetic mutation during a routine milk screening programme.
- Dairy Goat Co-operative (New Zealand) Ltd developed the world's first commercialised infant formula from goat milk and the world's first long-life goat milk, and continues to develop and make a range of premium specialty formulations based on goat milk.
- A long-term collaboration between Fonterra's ingredients business and Industrial Research Ltd has led to the world's first processing plant to produce complex lipids from milk. In a purified form, these lipids can be worth thousands of dollars a kilogram. They have a variety of applications in nutritional and cosmetic applications.

On the other hand, organic production in New Zealand is expected to be worth more than \$130 million within five years. In 2000, Fonterra had just seven farms supplying organic milk. That number has now grown to more than 80 and Fonterra expects to have 200 certified organic suppliers by 2013. Taranaki, Waikato and the Bay of Plenty have regional clusters of organic milk producers. The suppliers of organic farming inputs support the industry by providing seaweed drenches and organic fertilisers and animal health products. Fonterra produces more than 25 organic dairy ingredients, including a range of cheese, butter, fluids, proteins, blends and milk powders. Numerous smaller companies produce organic cheeses, milk powders and niche dairy products.

Development/ dynamics

While New Zealand's dairy industry has been performing relatively well in the past few decades, it still needs to meet a number of challenges and retain its success factors in order to continue developing. Various strategies are also proposed in the aim to further advance the industry.

Key Success Factors ¹⁸

A number of key success factors have been identified for New Zealand's dairy industry. A report presented by The Agribusiness Research and Education Network (2008) suggests that the success of New Zealand's dairy industry depends on the following factors:

- Successful development of international markets
- Political support in international markets
- Political support within New Zealand
- The evolution of industry structure to facilitate growth
- Farmer engagement in the development of industry policy, strategy, structure and operation
- Continuing technological advance
- Major disease-free status of national herd
- Development of economies of scale

Current and Future Challenges to NZ Dairy Industry

In the same report, The Agribusiness Research and Education Network (2008) has also identified a range of challenges for the industry. First, on farm challenges pertain to cows, pasture, the environment and farm financing and associated generation issues. Despite the tremendous advance in dairy genetics, the industry is concerned about evidence of declining fertility and increasing levels of mastitis amongst NZ dairy herds.

Second, environmental concerns also create challenges for the industry. Issues range from competition for water resources, the political challenges associated with obtaining access to resources, the determination of appropriate production responses to climate change policies and increased concentration of farming with larger properties and groups of properties.

Third, capital structure issues are currently debated with aspirations for capital to fund global growth; however, some New Zealand farmers are unwilling to lessen their ownership rights. The challenge is compounded by the redemption risk facing cooperatives. There appears to be more flexibility in considering a range of ownerships systems in extension, artificial breeding and farming than there is in processing and marketing.

Fourth, a concern frequently expressed by industry leaders was that the industry had not been able to sustain research programmes. This is partly due to the lack of funding and partly due the differences in views and commitments of Crown Research Institutes, Universities and the farmer

controlled sectors of the industry. Also, there is some tension between overseas versus New Zealand based research and short term versus long term research funding.

New Zealand's dairy industry is very conscious that this is part of a global industry. For many years it was comfortable with the idea that it was an exporter of NZ dairy products to the world. However, as Fonterra, in particular, has moved to being a company sourcing milk from around the world, the strategic challenge is seen as both more promising and more daunting. The industry appears to believe that there has been real success in achieving more coherent brand management but is unclear about the strategic imperatives and the basis for resolving the challenges associated with multinational operations.

Industry Strategies ¹⁹

In a 2009 report published by Dairy New Zealand, the industry good organization funded by New Zealand dairy farmers, a number of strategies that aim to improve New Zealand's farming systems, farm management, human resource for dairy industry and relevant government regulations are presented. These strategies are briefly summarised as the following:

1. Farming Systems Design and Adaptation Strategies

New options need to be generated from research and development by universities, research teams, on-farm innovation and agri-business. These options should then be integrated into farming systems with reference to overall system performance and regional variation. Also, farmer adaptation (which will lead to higher performing farm systems) could be achieved through effective adoption approaches, involving all parts of the industry networks and building capability in all parts of the industry. Finally, effective communication needs to be in place between government and dairy farms in order to test the effectiveness of government policy initiatives.

2. Farm Production System

New Zealand dairy industry needs to invest in increasing adoption of existing beneficial technologies, developing new technologies to increase potential milksolids production from forage, potential feed conversion efficiency, cow functionality and resource use efficiency. Animal evaluation systems that collect herd data and monitor herd status also need to be maintained and enhanced. Finally, in order to increase cow functionality, improvements need to be made to enhance animal health, traits and productivity.

3. Farm Management Systems Strategies

Ensuring that farm managers have the business skills to identify their goals and implement their plans could enhance dairy farm management. Farm managers' capabilities could be improved through appropriate education, research, on-farm training, establishing high-quality information sources and ensuring that dairy businesses have access to improved methods and tools that could support farm management.

4. Attracting Talents in the Dairy Sector

The industry should promote dairy careers to school-leavers, tertiary students and early career change individuals through ensuring that people in the industry are fully informed of career and

business opportunities in dairy farming, and know how to access these opportunities. Also, it is important to develop a quality work environment that allows autonomy while having agreed indicators and target for farm infrastructure in place. On-farm innovations should also be encouraged to improve the work environment. In addition, dairy people's careers could be developed through ensuring that high-quality training services, leadership programmes and mentoring or coaching programmes are in place.

5. Governments and Regulations Strategies

In terms of regulations, government should ensure that all plans and policies developed by local and central government relating to land use, resource availability, energy and environmental concerns are based on sound scientific, economic and social principles. Benchmarks and targets for increasing resource use efficiency and guiding good practice should also be established. It is important that the above is achieved through working and negotiating with dairy farmers to develop regulations that would maximize the effectiveness of farm performance rather than hinder such practices.

References

- ¹ New Zealand Trade and Enterprise. (2010, June). *New Zealand Dairy Industry*. Retrieved 23 Mar 2011, from <http://business.newzealand.com/common/files/Dairy-industry-in-New-Zealand.pdf>
- ² International Dairy Federation. (2010, March). *NZ Dairy Statistics*. Retrieved 24 Mar 2011, from <http://www.wds2010.com/dairystats.html>
- ³ Dairy New Zealand. (2009, April). *Strategy for New Zealand Dairy Farming*. Retrieved 23 Mar 2011, from <http://www.dairynz.co.nz/file/fileid/28814>
- ⁴ Ministry for the Environment. (2007). *Number of dairy farms in New Zealand*. Retrieved 29 Mar 2011, from <http://www.mfe.govt.nz/environmental-reporting/land/use/dairy-farms.html>
- ⁵ The Agribusiness Research and Education Network. (2008, December). *The Key Elements of Success and Failure in the NZ Dairy Industry*. Retrieved 23 Mar 2011, from <http://www.aren.org.nz/docs/dairy-technical-report.pdf>
- ⁶ New Zealand Trade and Enterprise. (2010, June). *New Zealand Dairy Industry*. Retrieved 23 Mar 2011, from <http://business.newzealand.com/common/files/Dairy-industry-in-New-Zealand.pdf>
- ⁷ The Agribusiness Research and Education Network (2008, December). *The Key Elements of Success and Failure in the NZ Dairy Industry*. Retrieved 23 Mar 2011, from <http://www.aren.org.nz/docs/dairy-technical-report.pdf>
- ⁸ International Dairy Federation. (2010, March). *NZ Dairy Statistics*. Retrieved 24 Mar 2011, from <http://www.wds2010.com/dairystats.html>
- ⁹ The Agribusiness Research and Education Network. (2008, December). *The Key Elements of Success and Failure in the NZ Dairy Industry*. Retrieved 23 Mar 2011, from <http://www.aren.org.nz/docs/dairy-technical-report.pdf>
- ¹⁰ Edwards, C., & DeHaven, T. (2002, March 3). Save the farms- end the subsidies. (Originally published in the *Washington Post*). Retrieved 24 Mar 2011, from http://www.cato.org/pub_display.php?pub_id=3411
- ¹¹ New Zealand Trade and Enterprise. (2010, June). *New Zealand Dairy Industry*. Retrieved 23 Mar 2011, from <http://business.newzealand.com/common/files/Dairy-industry-in-New-Zealand.pdf>
- ¹² Mackle, T. (2010, November 8-11). *New Zealand Dairy Farming on the Global Stage*. Presentation at the IDF World Dairy Summit, Auckland, New Zealand. Retrieved 21 Mar 2011, from <http://www.wds2010.com/programplus.html>
- ¹³ Commerce Commission (n.d.). *The Dairy Industry Restructuring Act*. Retrieved 23 Mar 2011, from <http://www.comcom.govt.nz/the-dairy-industry-restructuring-act/>
- ¹⁴ New Zealand Trade and Enterprise. (2010, June). *New Zealand Dairy Industry*. Retrieved 23 Mar 2011, from <http://business.newzealand.com/common/files/Dairy-industry-in-New-Zealand.pdf>
- ¹⁵ Dairy New Zealand. (2009, April). *Strategy for New Zealand Dairy Farming*. Retrieved 23 Mar 2011, from <http://www.dairynz.co.nz/file/fileid/28814>
- ¹⁶ Mackle, T. (2010, November 8-11). *New Zealand Dairy Farming on the Global Stage*. Presentation at the IDF World Dairy Summit, Auckland, New Zealand. Retrieved 21 Mar 2011, from <http://www.wds2010.com/programplus.html>

¹⁷ New Zealand Trade and Enterprise (2010, June). *New Zealand Dairy Industry*. Retrieved 23 Mar 2011, from <http://business.newzealand.com/common/files/Dairy-industry-in-New-Zealand.pdf>

¹⁸ The Agribusiness Research and Education Network. (2008, December). *The Key Elements of Success and Failure in the NZ Dairy Industry*. Retrieved 23 Mar 2011, from <http://www.aren.org.nz/docs/dairy-technical-report.pdf>

¹⁹ Dairy New Zealand. (2009, April). *Strategy for New Zealand Dairy Farming*. Retrieved 23 Mar 2011, from <http://www.dairynz.co.nz/file/fileid/28814>