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## ВЕРИГАТА НА СТОЙНОСТТА В МЛЕЧНИЯ СЕКТОР НА НОВА ЗЕЛАНДИЯ NEW ZEALAND DAIRY VALUE CHAIN

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### Резюме

В статията се прави преглед на млечния сектор в Нова Зеландия (НЗ) и се обсъжда веригата на стойността: производство, преработка и износ. Прегледът на наличната литература и данни са използвани при обсъждането на млечната промишленост на НЗ и веригата на стойността. Обща черта на млечната индустрия на НЗ през миналия век са процесите на рационализиране и консолидация чрез сливания, придобивания и стратегически съюзи. Прогнозата за развитието на млечната промишленост на НЗ е много оптимистична. Очаква се повишената ефективност да доведе до увеличаване на производството. В отговор на нарастващото търсене в световен мащаб, разширяването на достъпа до пазара и намаляването на експортните субсидии се очаква износът да се увеличи.

### Abstract

This paper provides an overview of the dairy sector in New Zealand (NZ) and discusses the NZ dairy value chain: farming, manufacturing and exporting. Reviews of existing literature and data are used for discussions of NZ dairy industry and the value chain. Rationalization and consolidation through mergers, acquisitions and strategic alliances were a common feature of the NZ dairy industry over the last century. The prognosis for NZ dairy industry is very optimistic. Increased efficiency is expected to lead to increased production. Exports are expected to increase in response to the increasing demand worldwide, expanding market access and reduction of export subsidies.

**Ключови думи:** Нова Зеландия, млечна промишленост, верига на стойността в млечния сектор, селско стопанство.

**Key words:** New Zealand, dairy industry, NZ dairy value chain, NZ agriculture.

### INTRODUCTION

Agriculture is a very important sector in New Zealand (NZ) economy. The share of agriculture in GDP is 4.5% in 2009 with main products: dairy, meat and forestry. Agricultural exports (including forestry) account for about 60% of the total NZ merchandise export earnings in late 2000s (MAF, 2009).

NZ has a unique natural advantage for agriculture and dairy farming in particular. NZ has small seasonal variations and high average rainfall, which allows pasture during almost all year around. NZ has more than 5 million dairy cattle in 2009 and is the world's eighth largest milk producer, with around 30% of the world-free dairy trade (MAF, 2003; MAF 2009).

NZ dairy industry dates back to 1814, when missionary Samuel Marsden brought a bull and two heifers

in to the country. The industry grew steadily after that and in 1871 the first dairy co-operative factory was established. The NZ government strongly encouraged the formation of dairy factories (butter and cheese) from 1880s on and as a consequence co-operative dairy companies appeared all over the country and by the 1900s their number was 111 (Evans, 2004). Since 1880s, NZ dairy cooperatives sold almost all their production to the United Kingdom after the refrigeration technology become available. In 1919, the first NZ dairy brand 'Anchor' was established in the UK. However, it was difficult for hundreds small dairy companies to service their foreign markets, therefore a Dairy Export Produce Control Board was established in 1923 to control all dairy exports. This dairy board helped farmers to access new markets and get better price for their products. As a result, dairy industry grew further and by 1930s the number

of dairy companies grew up to 400. The board was disestablished in 1934 when the government assumed all responsibility for product marketing and introduced a guaranteed price scheme (Evans and Meade, 2005; Conforte et al., 2008).

After the World War II, a process of consolidation and rationalisation of the NZ dairy companies begun for improving efficiency. The numbers of dairy co-operatives decreased to 220 in 1950s and 100 in 1960s (Evans, 2004). In 1961, the New Zealand Dairy Board (NZDB) was established by the Government and had monopoly rights over the purchasing and marketing of all dairy products exported from NZ. In 1973, UK joined the European Union and NZ dairy cooperatives lost their traditional market (the UK) and found themselves at a crossroads. As a response to this challenge, the NZDB initiated strategies of product and market diversification towards South East Asia. Since then the exports of NZ dairy products increase 3 times. Consumer marketing infrastructure and new brands were introduced. Cooperatives shifted their focus from butter and cheese to milk powder (whole-milk and skim milk). By the 1980s, NZDB had 19 overseas subsidiaries and associated companies (Dobson, 1997; NZDB, 1997; Akoorie & Scott-Kennel, 1999). In the 1990s, cooperative performance was based on cost efficiency, which decreased even further the numbers of cooperatives into 14 in 1994 (Conforte et al., 2008).

In October 2001, the two biggest remaining NZ dairy co-operatives, the New Zealand Dairy Group and Kiwi Co-operative Dairies, merged their operations together with the New Zealand Dairy Board (NZDB). As a result Fonterra Co-operative Group was created. The merger not only saw the birth of one of the five biggest dairy companies in the world, but also the removal of the NZDB's statutory exporting monopoly powers and therefore the deregulation of the New Zealand dairy industry. Fonterra has about 12,000 members/farmers and about 20,000 employees in 40 countries (McCarthy, 2000; Edwards, 2003; Conforte et al., 2008; Fonterra, 2010).

#### MATERIAL AND METHODS

After 2001, there are 3 core dairy companies in NZ - Fonterra Co-operative Group Ltd, Westland Cooperative Dairy Company and Tatua Cooperative Dairy

Company. Westland Cooperative has around 370 members/suppliers and Tatua Cooperative has around 130 members/suppliers. All three cooperatives have value added consumer products, either alone or by alliances with international food processors (Conforte et al., 2008). There are also around seventy smaller dairy companies operating in product or regional market niches in NZ such as Sunlait Ltd, Goodman Fielder Ltd, Open Country Cheese Ltd (Gardner, 2005; Abare and MAF, 2006).

This paper provides an overview of the dairy industry in NZ and discusses the NZ dairy value chain. The discussion and analysis are based on official data from the NZ Ministry of Agriculture and Forestry, NZ Statistics and other existing literature.

#### RESULTS AND DISCUSSION

For better understanding of the NZ dairy industry, value generating activities that form the dairy value chain are discussed. These activities are: dairy farming; manufacturing and distribution; exporting - incorporating the marketing and distribution to overseas markets.

##### Dairy farming

The NZ dairy industry has grown considerably during the last 30-40 years as shown in Table 1. Total number of dairy cows in 1978/79 was 2.04 million but their number has increased consistently to 4.25 million in 2008/09. The number of farm (herd) decreased from 16,907 in the end of 1970s to 11,618 in the end of 2000s, while the average herd size grew up three times in the last 40 years from 121 in 1979 to 366 in 2009 (Table 1).

A number of measures are taken to assess the efficiency of dairy farms, including average milksolid per herd (average milkfat per herd), average milksolid per cow (average milkfat per cow). As can be seen in Table 1, milkfat produced per herd and per cow basis has trended upward during the last 40 years. From 1978/79 season to 2008/09 season, average milkfat produced per cow jumped about 30% from 142 kg to 184 kg per cow (Table 1). These positive production trends are result of improved technology, innovation and economy of scale. Dairy output has expanded rapidly over the past few decades owing to improvements in productivity, and the conversion of other

**Table 1.** Changes in on farm trends in the NZ dairy industry

	1978/79	1988/89	1998/99	2008/09
Total cows ('000)	2,040	2,269	3,289	4,253
Number of dairy farms	16,907	14,744	13,861	11,618
Average Herd size	121	154	229	366
Average kg milkfat per herd	17,500	22,442	35,047	68,116
Average kg milkfat per cow	142	143	165	184

Source: Dairy NZ; Statistics NZ

types of farms to dairy farms (MAF, 2009). New Zealand is perceived as one of the lowest cost producers of milk in the world due to a suitable natural environment for dairy farming and having technological and business savvy farmers (MAF, 2004; Conforte et al., 2008).

The vast majority of the NZ dairy herds (97%) supply milk seasonally for manufacturing and export. Cows start milking from late July and dried off in the following May. The other 3% of herds supply milk year-around for domestic liquid milk market (Abare and MAF, 2006).

### Manufacturing and distribution

NZ has been processing more than 10 million tonnes of milk in the last decade and in the end of 2000s the milk processed reach 15 million tonnes. In 2008, almost 1 million tonnes of milk powder and over 300,000 tonnes of butter and cheese have been produced in NZ (MAF, 2009). The success of the NZ dairy industry is linked with the payout (per kilograms of milksolids). The payout in the last 20 years has been "better" compared "disastrous 1980s" when the NZ economy, including agriculture were deregulate in 1984 (Dobson, 1990; Edwards, 2003).

Payouts to farmers demonstrate considerable volatility over different seasons, with a low of \$3.29 per kilo in 1990/91 season to a high of \$7.67 per kilo in 2007/08 season. Despite fluctuating international market conditions, New Zealand dairy co-operatives managed to keep payout to farmers over \$4 per kilo since 1991 and in the last years the payout was over \$5 (Figure 1).

The three largest companies processing milk are cooperatives and they are: Fonterra Cooperative Group Ltd, Westland Co-operative Dairy Company Ltd and Tatua

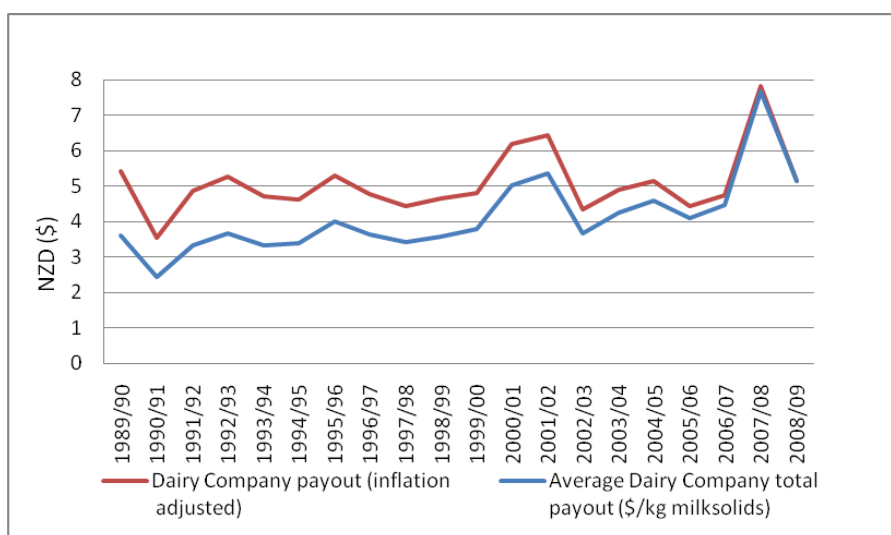
Cooperative Dairy Company. Fonterra handles 95% of the country's dairy processing (over 14 billion litres of milk production) and exports various dairy products to over 140 different countries. This cooperative is the world's largest exporter of dairy products and is responsible for around 30% of world cross-border dairy trade. Westland Cooperative collects over 337 million litres of milk annually and manufactures over 70,000 tonnes of milk powder, butter and casein. Tatua dairy cooperative processes around 106 million litres of milk annually (MAF, 2004; Conforte et al., 2008).

Production and manufacturing began to be centralised in the second half of the 20th century, with facilities such as the Fonterra dairy factories at Whareora, Te Rapa, Edendale and Timaru being the four largest in the Southern hemisphere. Edendale is also currently the largest dairy factory in the world by milk intake (liters of milk). This factory has the capacity to process 11 million liters of milk per day (Fonterra, 2010).

### Dairy exporting

NZ is the world's single largest exporter of milk products with around 30% of the world-free trade. Dairy produce is NZ's single largest export earner. Although NZ produces a relatively small proportion of the world's total milk (2-3%), its share of the world dairy trade is very significant (MAF, 2004). In 2008, the dairy industry earned 21.1% of the total NZ merchandise export, while in 1987 it was only 14% (NZDB, 1998; MAF, 2009).

The majority of NZ's milk is processed into dairy products. Around 95% of the manufactured dairy products are exported as a result of NZ small population and small domestic market for dairy products (MAF, 2009). In



Source: Statistics NZ, 1988/89-2008/09

Note: Weighted to give real dollar values using the Consumer Price Index for the end of the June Quarter

Figure 1. Trend in milksolids payout to dairy farmers

comparison, globally, only about 5% of the total dairy production is traded internationally, the remaining 95% being consumed within the country of origin (Sankaran and Luxton, 2003).

The volume and value of NZ dairy export followed a trend of steady increase over the last two decades. However, the value of the dairy export fluctuated mainly due to the fluctuation of the NZ dollar and international dairy prices. In 1987, the export value of dairy products was 1.7 billion NZD while in 2009 it was about 11 billion NZD. The export value of the dairy products in 2007/08 was record high due to the high world dairy prices. The export volumes of dairy products increased dramatically from 670 thousand tonnes in 1987 to over 2 billion tonnes after 2007 (Figure 2).

Since 2000, NZ's total dairy exports have grown at a rate of 3.75%. However, the drought during the summer (January to April) of 2008 resulted in a 3% decline in milk production and decrease in dairy product exports in 2008/09 season (MAF, 2009).

The key NZ export dairy products are milk powder (wholemilk (WM) and skimmed (SM)), butter, cheese and casein. Over the past two decades, there was significant fluctuation of the export values of different dairy products. In the 1980s, butter was the main dairy export product. In the early 1990s, milk powder took the leadership of the NZ dairy exports. The export value of the milk powders increased from 600 million NZD in 1987 to 4.6 billion NZD in 2008/09, which represent a growth of over 400% (Figure 3). In 2009, milk powder exports were almost 50% of the value of all NZ dairy exports. Over the last 15-20 years, the share of butter and cheese exports were relatively stable until 2007/08 when the prices of dairy products were record high (MAF, 2009).

In recent years, NZ is the world's largest exporter of butter, skim milk powder and casein and the second

largest exporter of cheese and whole milk powder (excluding intra-EU trade). NZ has achieved this position without production or export subsidies and without protecting its market from foreign competition (MAF, 2003; Abare and MAF, 2006).

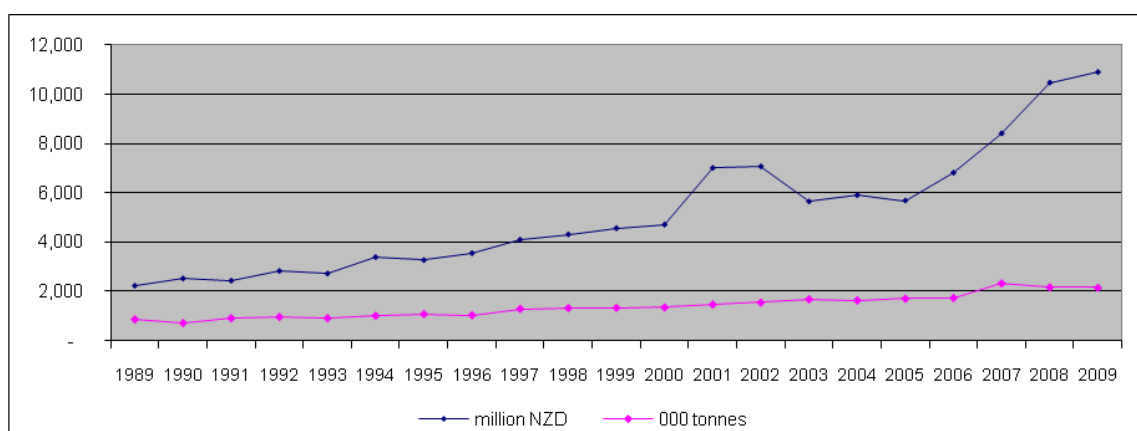
NZ exports dairy products to 152 countries all over the world. However, its main export markets traditionally are USA, Asia and Europe. Significant was the regional sale increase in Asia from less than a 1 million NZD in 1990 to 4.9 million NZD in 2007 (Figure 4). Asia accounts for over 40% of New Zealand dairy export volume. China has been the fastest growing market for New Zealand dairy products where in 1988 the dairy exports were about 10 million USD and in 2007 they reached about 480 million USD (Conforte et al., 2008).

The key markets for NZ cheese in 2008 were Japan, Australia and Korea. Venezuela become the leading export destination by volume for WMP followed by Sri Lanka and Malaysia. The top markets for NZ casein exports were USA and EU. The EU, Iran and Russia were the key export destinations for the New Zealand butter (MAF, 2009).

NZ dairy industry is also unique as its domestic markets are open to world traders, with no tariffs or quotas, and also there are no subsidies or other government assistance either for home production and sales, or for export sales (NZDB, 1988). Furthermore, NZ has an excellent position to grow its share of emerging markets in Asia and the Middle East.

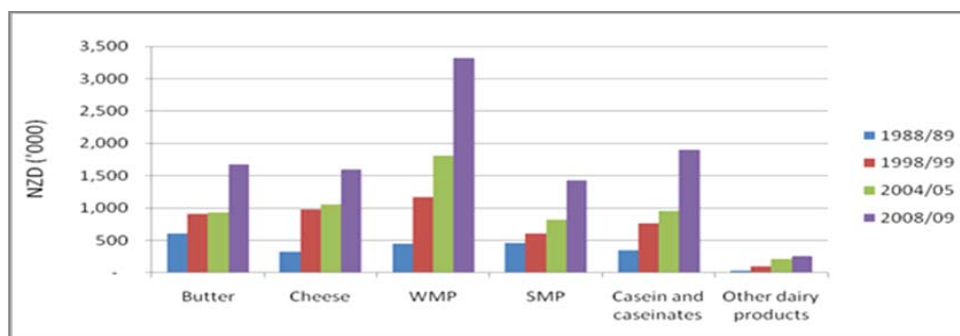
## CONCLUSIONS

In recent years, rationalization and consolidation through mergers, acquisitions and strategic alliances is a common feature of the NZ dairy industry. The driving forces for the development of the NZ dairy industry include economies of scale, increased competition for raw material,



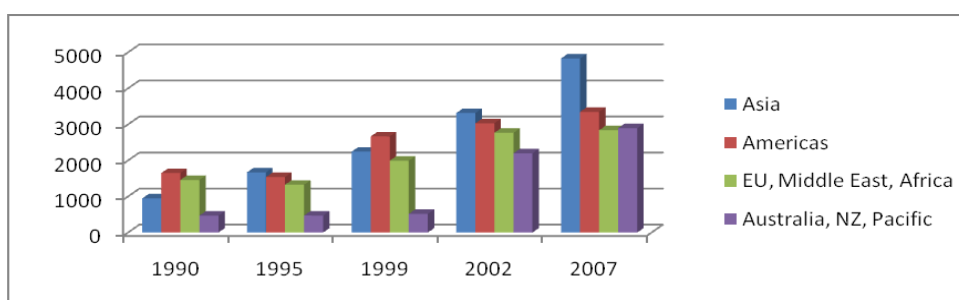
Source: MAF, NZ; Statistics NZ

Figure 2. New Zealand total dairy export – 1989-2009



Source: MAF, NZ

Figure 3. Export of dairy products for selected years



Source: MA, NZ; Fonterra

Figure 4. Dairy export markets by region in 1990, 1995, 2002 and 2007 ('000 NZD)

internationalization, changes in companies' formal structures and the desire to capitalize on the favourable market positions (OECD, 2002).

The growth and success of the NZ dairy industry could be associated with several factors:

- favourable endowment of natural resources for grass production;
- on-going search for innovation and technological improvement by farmers, input suppliers, public research and education institutions, manufacturing, and marketing companies;
- 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 institutional and 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 (Conforte et al., 2008).

Forecast for the NZ dairy industry is very positive. Increased efficiency is expected to lead to increased

production. Exports are expected to increase in response to increasing demand worldwide, expanding market access owing to a lowering of trade barriers, and the reduction of export subsidies in the world's markets (MAF, 2009).

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