

A Structural Analysis of the New Zealand Dairy Industry

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Introduction

The agri-business sector plays an important role in the New Zealand economy. It contributes close to 70 percent of New Zealand's export earnings. Within the agri-business sector, the dairy industry is one of New Zealand's biggest rural industries. Dairy farming, which accounts for approximately 20 percent of New Zealand's total exports, has emerged as an important and primarily export-oriented industry. In 1989, the dairy industry made up almost five percent of GDP.

Consumption data indicates that, in a typical year, only 13 percent of the total dairy products produced in New Zealand are consumed domestically. This implies that 87 percent of the country's production is destined for export. New Zealand produces less than 1.5 percent of the world's total milk supply, but it accounts for a 25 percent share of the world's dairy products trade (New Zealand Dairy Board, 1991). Excluding trade between the European Community (EC) countries, New Zealand's share of world exports in 1989 was 27 percent in butter, 20 percent in whole milk powders, 14 percent in skim-milk powder, 15 percent in cheese, and 49 percent in casein (Crocombe et al., 1991). The New Zealand dairy industry's high dependence on the export market has made it highly vulnerable to the fluctuating conditions in the international dairy trade arena.

The industry has a long history of controls and regulations. Some of the major elements in this history include (Hussey, 1992, p.97): 1) promulgation of the first Dairy Industry Act in 1892 which regulated the quality of milk used to manufacture butter and cheese for export; 2) an act in 1908 which ensured that all dairy manufacturers would be cooperatively owned by milk suppliers; 3) the establishment of the Dairy Industry Control Board under the Dairy Produce Export Control Act in 1923 to be the central export

seller; 4) the establishment in 1935 of the Primary Products Marketing Department responsible for all dairy product sales; 5) the requirement that all butter and cheese be exported to the United Kingdom in the 1940s and early 1950s unless authorized otherwise by the United Kingdom; 6) the establishment of the New Zealand Dairy Products Marketing Commission in 1947 with the sole authority to export and set milk prices; and 7) the establishment of the New Zealand Dairy Board in 1961 by the government, providing it with legislative underpinnings including a monopoly in the exportation of New Zealand dairy products.

The structure of the dairy industry is much the same as it was in the early 1960s. The industry, although highly vertically integrated, is cooperatively owned by farmer suppliers. Their ownership of manufacturing companies is based on the shares allocated to them on the basis of the volume of milk they supply. As such only supplier-farmers can hold shares in the cooperatives. These cooperative dairy companies are autonomous commercial entities with independent powers to decide on investment, milk use, and manufacturing operations.

The New Zealand Dairy Board (NZDB) is the statutory single seller of New Zealand's dairy export products. In some instances, the NZDB permits some dairy companies to directly export dairy products to markets not being targeted by its activities and operations. The Board determines the mix of products and markets which it believes will maximize returns to producers and the industry. The majority of the Board of Directors of NZDB are farmers elected by their colleagues. The other members of the Board of Directors are government appointees. Over its more than six decades of life-span, the NZDB has evolved from a regulatory and control authority to an increasingly aggressive multinational dairy product and food marketing firm. The NZDB is now the world's single largest dairy exporting organization.

Like many other New Zealand firms, the Dairy Board was stripped of subsidies after the Labour government came to power and launched a program of economic liberalization beginning in mid-1984. However, it has retained its statutory authority to be the single exporter of New Zealand's manufactured dairy

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products. In recent years, the Dairy Board has placed increasing emphasis on the development of an international corporate strategy. Some of its main strategies include increased exportation of specialized, value-added products; increased sales through foreign subsidiaries; and diversification across products and countries. The Board markets about 500 products ranging from pharmaceuticals to stock food and extending from baby food to plastics (New Zealand Dairy Board, 1992). Dobson (1990) suggested that the Dairy Board has been relatively successful partly because it was an early mover in its strategic activities.

Increasing cost structures have also had an impact on the dairy companies. In the 1930s, there were more than 400 cooperatives in the dairy industry. Through time, however, the cooperatives have striven for scale economies in order to improve returns to their supplier-farmers which has led to consolidation in the industry. By 1970 the number of dairy cooperative companies has been reduced to 95 and even reduced further in 1991 to 17, primarily through company mergers (Table 1).

Table 1: Number of Dairy Cooperative Companies in New Zealand.

	May 1970	May 1980	May 1991
Total	95	42	17
North Island	59	29	9
South Island	36	13	8

Source: New Zealand Dairy Board, 1991

The NZDB has a diverse spread of markets across the world. The composition of New Zealand dairy exports in 1990 by market region on a sales revenue basis is presented in Table 2. Exports to Asia (excluding Japan and Korea) account for 23 percent of the total sales revenue of NZDB. Europe is also a big market for New Zealand dairy products, accounting for 16 percent of the total sales revenue. Exports to North America and Japan/Korea each account for 12 percent of the total sales revenue. About 10 percent of the total sales revenue comes from exports to the Middle East and Africa; 10 percent from Australia and the Pacific Islands; and about six percent from the former USSR.

The NZDB pays the same price for a particular product to all the manufacturing companies. The price for each product is determined on the basis of average costs of processing and transportation. In addition to these two cost factors, due consideration is given to the envisaged international price of milk. This is referred to as "the advance price," which is determined at the beginning of each season. Payments for products purchased by the NZDB are made to the dairy companies monthly.

Table 2. New Zealand Dairy Exports by Region on a Sales Revenue Basis (1990)

Region	Percent of Total Sales Revenue
Asia*	23
Europe	16
North America	12
Japan and Korea	12
Latin America	11
Middle East/Africa	10
Australia/Pacific Islands	10
Former USSR	6

*Excluding Japan and Korea

Source: New Zealand Dairy Board, 1990.

The final purchase price is determined at the end of each season. This involves taking into account the price differentials within the season, the advance price, and the prevailing conditions in the international market. Whatever differences are accumulated between the advance price and the final prices are paid to the dairy companies. The dairy companies then adjust their payments to the farmer suppliers accordingly. These payments for products purchased also include the returns from exports (New Zealand Dairy Board, 1991).

The purpose of this study is to review the current structure of the New Zealand Dairy Industry through an assessment of its internal and external structural characteristics.

Method

This case study was prepared using published materials on the dairy industry and its policies and marketing arrangements. Secondary data from recognized publications were also used in the analysis. In addition, interviews were conducted with three dairy companies,

the NZDB, and the New Zealand Cooperative Association. The three dairy companies interviewed were Tui Milk Products Ltd., Bay Milk Products Ltd., and New Zealand Cooperative Dairy Company (NZCDC) Ltd. Selection of the dairy companies was based partially on their size and their willingness to participate in the interview. Porter's structural analysis technique was used in the study (Porter 1980).

Structural Analysis

Industry Strengths

The NZDB is one of the largest dairy exporting firms in the world. For the year ending May 1992, the NZDB's consolidated revenue was NZ\$5.2 billion (New Zealand Dairy Board, 1992). Its vertically integrated structure provides the industry with the strength to face the many disadvantages in its environment. The disadvantages include the distance from and lack of access to markets; lack of a large domestic market in which to develop products; and the industry's relative smallness when compared to its major competitors. However, the national identity achieved through a single seller at the international level provides the industry with the leverage to penetrate politically dominated markets such as the EC.

Furthermore, the NZDB is selling in approximately 100 markets. The offshore network of companies is providing market security for the industry in these markets. Having a presence in the respective markets enables the industry to respond much more quickly to changing consumption patterns and needs of consumers. The extensive marketing network therefore places the industry in a more pro-active position.

Another source of the industry's strength lies in the fact that the NZDB is selling the industry's own brands of consumer products in 60 different countries. Some of these products are not only branded but are also value added, catering to individual niche markets. In general, approximately 80 percent of the industry's dairy product sales are differentiated to some extent. In 1990, about 300,000 tons of the industry's total sales were substantially differentiated with significant added value (Spring, 1992).

Along with the competitive market features that provide strength to the industry, advantages enjoyed by the industry through the enhancement of natural endowments also exist. New Zealand has favorable growing conditions and an efficient farming sector that has constantly upgraded production efficiency. In order to assist the farmers in developing the productivity of their herds, the Livestock Improvement Corporation (LIC) was established by the NZDB some forty years ago. The LIC operates a sire proving scheme through

which bulls of high genetic merit are selected each year for artificial breeding. The LIC also provides herd testing services to enable farmers keep regular milking records. The establishment of LIC has further enhanced farm productivity and reinforced New Zealand's position as a low cost dairy producer. New Zealand is now considered one of the lowest-cost producers of milk in the world.

New Zealand's natural advantages are enhanced by well-educated and innovative farming community. According to industry sources, at least 40 percent of New Zealand farmers have had some form of higher education related to farming, unlike Australian farmers. As such they tend to be more willing to adapt to new technologies (Crocombe et al., 1991).

Fierce competition among the dairy cooperatives has spurred improvements in processing efficiencies. Results of the personal interviews conducted reveal that the dairy cooperatives compete strongly to attract farmer suppliers and for pay-outs to farmers. New Zealand's dairy processing plants are now among the most efficient plants in the world.

Industry Weaknesses

The prices received by the dairy farmers from NZDB basically reflect all the variation in the Board's total sales revenue. For instance, industry statistics indicate that the proportion of the sales revenue going to the dairy farmer varied between 49 percent and 61 percent between 1989 and 1991. Dairy farmers receive returns from their cooperative on a monthly basis, and this payment is determined in large part by what the NZDB pays the cooperative. Moreover, payments to the dairy farmers are partly based on the average processing cost of the dairy manufacturing companies. Therefore, the higher the costs a company incurs, the lower its returns will be. The side effect of this payment system has been the intense effort to process at lower costs, obscuring the need for research and development within the dairy companies. The payment system could also have stifled innovation within the cooperative dairy companies because it does not adequately reflect returns on research and development efforts. Some industry analysts argue that the system of pooling returns provides distorted production and price signals to farmers, which may result in misallocations of resources.

The NZDB has also been involved in other businesses outside the dairy industry (such as the importation and sale of Lada cars from the Commonwealth of Independent States and the marketing of lychees produced in Thailand) to support or enhance dairy product sales in these countries (Hussey, 1992). The returns from these business ventures are reflected

in the pay-outs to the New Zealand dairy farmers (New Zealand Dairy Exporter, 1992). The Board, for instance, reported that in 1990-91, some 20 percent, or close to one billion New Zealand dollars, of sales revenue came from trading non-New Zealand dairy products. Some industry observers note that including these activities into milk pay-outs to dairy farmers would distort the figures and would give farmers the wrong price signals, which could lead to resource misallocations. These distortions may arise because, given the "bundled" returns that the farmers are receiving, they probably would not know the market price they are getting for marginal milk production.

Another weakness in the dairy industry is the significant information gap between the locally based manufacturing companies and the market for their products. The dairy companies have to rely on the NZDB to transmit to them the changes in the export market demand patterns. This gap evidently places the manufacturing companies in a "waiting" rather than a pro-active position. Furthermore, the companies interviewed indicated that they have little room to determine their product mix because of their dependence on the NZDB's perception of the international market conditions.

An additional disadvantage borne by industry is that its sources of capital are limited. Being cooperatively owned, the industry does not have a secondary market for its capital stock. A few of the managers interviewed acknowledged that the opportunities for raising equity from non-members is restricted and the direct infusion from members is usually very small. The calculated debt equity ratio based on NZDB financial report for 1992 is greater than one (approximately 1.6), which is indicative of a greater reliance on debt financing.

Although there are no legal impediments preventing the entry of a proprietary company into the dairy processing sector, potential industry entrants are constrained by factors such as the need to secure farmer suppliers and the need to export dairy products through the NZDB. For instance, dairy companies would need to approach the NZDB if they wish to export their products, and the Board would either need to agree to buy their output or grant them permission to sell overseas.

Some industry analysts think that the NZDB's mission to achieve long-term maximum returns for milk produced by New Zealand farmers actually restricts the Board's entry into non-dairy consumer-foods markets. This has limited NZDB's ability to exploit economies of scope in its operations. The NZDB has diversified its sales base and has launched a range of consumer dairy products in several countries in the 1980s. Despite the improvements in product and

market mix achieved by NZDB in the 1980s, many industry observers doubt whether the industry had moved far enough in this direction. For instance, other than the Anchor brand in Britain, the NZDB has no significant position in branded consumer goods in the industrialized world (Crocombe et al., 1991).

Despite high per capita consumption of dairy products, industry observers admit that the domestic demand lacks sophistication because of the undiscerning nature of New Zealand dairy buyers. Furthermore, due to its small size, the New Zealand market provides little stimulus for development of new consumer and industrial products (Crocombe et al., 1991).

Industry Opportunities

Efforts to liberalize agricultural trade through the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) trade negotiations have passed several deadlines, and have entered into their eighth year. A successful conclusion to these negotiations would provide the New Zealand dairy industry with a more easily accessible international dairy market as well as better returns from export dairy products. A successful outcome of the GATT negotiations could improve market accessibility and reduce export subsidized competition. The New Zealand dairy industry could, in turn, benefit from increased returns as a result of higher world prices for dairy products. The expected increases in dairy product prices following the implementation of the GATT package could range from 20 percent for butter and cheese to 60 percent for milk powders (SriRamaratnam, 1992).

Some of the dairy companies interviewed were optimistic that North and Southeast Asia will provide them with excellent opportunities to expand the market for New Zealand dairy products. This region embraces some of the fastest growing economies in the world. Reinforcing the potential of this growing market are the proximity advantage and a possible successful close to the GATT Uruguay round. Further opportunities in market growth are presented through joint ventures, wholly owned subsidiaries, and the four offshore regional development centers. These initiatives equip them with first hand market information and, therefore, offer the industry the potential of being an early mover.

Opportunities are bright in the area of value added dairy products marketing. In 1977, approximately 80 percent of export sales were commodity products. In 1989, some 67 percent of New Zealand's dairy exports were still basic commodities that could be secured from many countries. Although this was an improvement from the 1977 figure, 40 percent of exports were still in commodity butter. The amount of commodity products being sold on volatile spot markets

has been reduced, however, by nearly half in the past 10 years (Crocombe et al., 1991). However, the NZDB implemented a major change in the strategic direction of its marketing activity in the 1980s. This strategy is aimed at decreasing the Board's dependence on uncertain commodity markets and directing as much of its products as possible into consumer markets. An important part of the strategy has been to shift much of the responsibility for marketing from New Zealand to the Board's subsidiaries in individual markets (Hussey, 1992). Although the success of the NZDB's diversification strategy is still described by most industry observers as "modest," many opportunities are present to further increase the value of New Zealand's dairy output in marketing value-added products in retail and consumer markets around the world.

Industry Threats

New Zealand could face possible isolation from important markets with the potential emergence of regional trading blocks. A common feature of trading blocks is that trade within the blocks is promoted through the elimination/reduction of tariffs and non-tariff barriers, while trade with countries not belonging to the block is obstructed. Hopefully the signing of the North American Free Trade Agreement (NAFTA) in 1993 will eliminate trade barriers between the three North American trading partners, namely the United States, Canada, and Mexico. (U.S. Department of Agriculture, 1992). Important to the New Zealand dairy industry is the fact that Mexico is the world's largest importer of non-fat dry milk, accounting for up to one-quarter of world imports of the product during the latter half of the 1980s (Dobson, 1992).

The New Zealand dairy industry succeeded in securing the largest-ever sale to Mexico in 1992. However, with the NAFTA agreement, the United States could possess a greater competitive advantage over other exporters such as New Zealand. In fact, Dobson (1992) indicates that NAFTA could enhance opportunities for U.S. exporting firms to expand sales of dairy products not only in Mexico but also in Canada.

Besides the threat of further market constriction, the industry faces uncertainty in its single seller structure, provided for in the Dairy Producer and Control Board Act of 1961. The existence of a statutory marketing board in the industry is considered by both local and foreign potential entrants as a strong barrier to entry (Hussey, 1992). One of the issues frequently debated in New Zealand is the degree of market distortions that the activities of the Board represent. Many New Zealanders are not contemplating the elimination of the NZDB because of their belief that the competi-

tion they face in international markets bears no resemblance to the free market competition described in economic textbooks. They see the international markets as replete of subsidies, quotas which limit access to imports, traders with sole importing rights, and huge multinational companies. For instance, the United States, Japan, and the EC protect their domestic industries from international competition. The EC's subsidized export of production surpluses is considered a significant influence in world dairy trade.

In contrast, New Zealand's dairy industry receives no subsidies or other government assistance for home production and sales, nor for export sales. There is some debate, however, about whether the lack of competition from other locally-based marketing firms discourages innovation and the desire to move away from commodity selling. Compulsory participation in the Board's activities could also preclude producers from using alternative marketing channels. In fact, the so-called "Porter Project in New Zealand" (Crocombe et al., 1991) suggested the importance of the role that a more vigorous domestic rivalry could play in accelerating the shift from selling commodity products to selling differentiated products. It is also argued that the NZDB's statutory obligations provide little stimulus for diversification into more profitable upstream, downstream, or related industries and, therefore, could be a threat to the industry's competitive advantage.

Technological change in the dairy sector is an important factor that could seriously threaten the future competitiveness of the New Zealand dairy industry. Among the possible technologies already available is the synthetic Bovine Somatotropin (bST). Chadee and Guthrie (1991) have indicated that adoption of bST in the United States would increase the nation's milk production significantly. Inevitably, the United States could emerge as an even larger exporter than New Zealand, adding to the already abundant surpluses on the world market. Furthermore, this development could impose increasing pressure on other dairy exporters, such as the EC countries, to adopt bST in their production processes. This could result in greater surpluses in the world dairy markets.

Concluding Comments

The situation in the world dairy market is influenced by both economic and political factors and decisions (Clough and Isermeyer, 1985). For instance, of the 24 million ton equivalent of international dairy trade, only 15 million tons is freely accessible. The freeing of the other nine million tons is dependent on the GATT negotiations, as is the reduction in the six billion dollars' worth of export subsidies, mainly from the EC.

For the dairy industry to remain competitive in such an environment, emphasis has to be placed on research and development. Higher returning differentiated and customer specific products rather than bulk products are key to increased returns. Highly differentiated and customer specific products also provide possibilities for niche marketing and, therefore, market security.

Unquestionably, this has been the core strategy of the New Zealand dairy industry. However, the existing structure has placed local dairy manufacturing companies in a complacent position regarding research and development. The payment system which obscures these efforts is a major factor in the low local industry participation in research and development. Evidence also suggests that there is a need to develop more sustainable milk production technologies in order to remain competitive in the future. Low milk production cost advantage based on a natural resource is not highly sustainable in the light of production technologies such as bST. This advantage is also threatened by the possibility of some of the former Eastern Bloc countries, which have lower labor costs, revitalizing their dairy industries.

This case study does not provide the basis for determining the best structure for the New Zealand dairy industry. A valuation of the strengths and weaknesses of alternative industry structures, including the existing one, would be required for a conclusion to be drawn. Although difficult, this could be the basis for future research on the industry. The study, however, provides some valuable insights into the structure and conduct of the New Zealand dairy industry. This industry may, considering its size and importance in international dairy trade, may have important implications for dairy industries elsewhere in the world.

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