

The Competitiveness of Alberta's Dairy Industry

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▪ Take Home Message

- If all trade restrictions are removed today, a very unlikely event, the US dairy industry is better positioned to take advantage of the new trade rules.
- Canada's dairy industry needs to keep abreast and continue to adjust to the changing trade environment.
- **Timing** of regulatory changes and industry adjustment in Alberta and Canada is very critical to future industry sustainability and growth.
- Domestic regulatory changes should **precede** border changes to give the local industry sufficient time to adjust.
- Alberta's dairy industry seems to be in the best position to compete against other provinces and the USA.
- There is need for increased public and private investment in research to rapidly increase milk production per cow and reduce milk production costs.
- Dairy farming and dairy processing are mutually dependent; they must continue to work together to secure a promising future in the 21st Century.

▪ Introduction

Background

Dairy farming in Alberta is a relatively stable and profitable business. This stability is a direct result of strict controls over production and imports, and administered prices. Controls are implemented at two levels, nationally and provincially. Every year, at the national level, the Canadian Milk Supply Management Committee (CMSMC), an agency of the Canadian Dairy Commission (CDC), determines the Canadian requirements for industrial milk.

The CDC then assigns each province its share of industrial milk from this national market share quota (MSQ), and establishes a target industrial milk price. Imports of milk and milk products are also controlled using a system of tariffs and import permits.

The Uruguay Round of the GATT, which came into effect January 1, 1995, established completely new trade rules for agriculture. The various provisions of the Uruguay Round Agreement defined and set rules affecting market access, export subsidies and domestic support. The market access provisions committed member countries to convert all non-tariff barriers, including import quotas, into tariff equivalents, a process called "tarification". By the year 2001, these tariffs are expected to decline by 36 per cent. Accordingly, Canada converted its import quotas for dairy and poultry products into tariff rate quotas (TRQ's) to conform to the Uruguay Round.

Canada also concluded a North American Free Trade Agreement (NAFTA) with the United States of America (USA) and Mexico. There were disagreements between Canada and the USA, over the interpretation of the NAFTA agreement as it related to the supply- managed industries. Some disagreements were resolved in September 1996, but US dairy industry dissatisfaction persists due to perceived limited access to the Canadian market and Canada's export pricing policy. Similar dissatisfaction is shared by New Zealand; both the USA and New Zealand have taken their concerns to the World Trade Organization (WTO). As it stands, the combination of US as well as New Zealand dairy industry dissatisfaction, the potential impacts of the new trade rules arising from upcoming WTO negotiations, and the removal of impediments to inter-provincial commerce, present many challenges and opportunities for Alberta's dairy industry. Canada's dairy farmers, processors and consumers should have a keen interest in what happens to Canada's dairy industry.

Objectives of the Study

The purpose of the study was to determine the competitiveness of Alberta's dairy industry.¹ Specifically, how does the economic performance of Alberta's dairy farms compare with other dairy farms in Canada and the USA? How does the dairy processing sector compare with its counterparts elsewhere in North America? Given changes in GATT rules, the NAFTA agreement and the removal of inter-provincial trade barriers, how is Alberta's dairy industry positioned to meet the competition and changing market conditions?

Method of Analysis

Using historical data, dairy farming and milk production in Alberta were compared to dairy farming and milk production in selected Canadian provinces

¹ Ross, C.B.A., Susko, R. and Jaipaul, R. 1998. An Analysis of the Competitiveness of Alberta's Dairy Industry. Alberta Agriculture, Food and Rural Development. Edmonton, Alberta.

and US states. Dairy farm costs and returns were compared across the different jurisdictions to determine relative competitiveness in milk production. Similarly, dairy processing and processing margins were examined to measure competitiveness between Alberta and competing jurisdictions.

A regional equilibrium model was developed to determine relative changes in milk prices, milk production and processing milk products, given the removal of institutional impediments to trade. The projected shifts in regional milk production were taken as indicators or measures of dairy competitiveness.

Government policies regarding health regulations, the environment, conservation and irrigation water can affect fixed and variable expenses on dairy farms. Consideration of the effects of these policies were beyond the scope of this report.

Sources of Data

The main sources of farm data for the Ross, Susko and Jaipaul study were reports from the Alberta Dairy Control Board (DCB) and the Food Quality Branch of Alberta Agriculture, Food and Rural Development (AAFRD). The Alberta records were not always complete, and in some instances were inconsistent. Consequently, greater emphasis was placed on registered shipper data as reported by the DCB. These data were supplemented with agricultural statistics from the previous Market Analysis and Statistics Branch of AAFRD, Statistics Canada, and Agriculture and Agri-Food Canada.²

The economic analysis in this study was based on data obtained from the annual Dairy Cost Study conducted by the Production Economics and Statistics Branch of AAFRD. The study consists of a representative sample of dairy farms which submit monthly records of their milk production costs and returns to the branch. Additional data and information were obtained from the CDC, the United States Department of Agriculture (USDA) and published research studies.

Dairy processing data and information were obtained mainly from reports by Statistics Canada, the National Dairy Council, USDA and the United States Department of Commerce (USDOC).

Additional information came from an unpublished report from the Department of Rural Economy of the University of Alberta that was done specifically for this study, and personal communications with specific industry agencies and personnel.

² As of June 1997, the Statistics Unit of the Market Analysis and Statistics Branch was merged with Production Economics to form the Production Economics and Statistics Branch.

▪ Dairy Farming in Alberta

Milk producers and processors are two of the principal stakeholders of the dairy industry. At the farm level, despite the decline in dairy farm numbers and the dairy cow population, milk production in Alberta has been increasing. This increase has come about through increasing milk productivity of the provincial dairy herd, and greatly improved milk quality. As of July 1, 1995, it was estimated that more than three-quarters of Alberta's dairy herd were located in West Central and southern Alberta where there is an ample supply of high quality forage.

Production and supply of raw milk in Alberta are controlled by the Alberta Dairy Control Board (DCB) through the issuance of quotas to registered dairy farms. With the exception of milk designated for Special Classes and the Optional Export Program, these quotas restrict the volume of raw milk which a farm can produce for fluid and industrial purposes. In the case of milk designated for Special Classes and the Optional Export Program, farm participation is limited to 10 per cent of the total farm milk quota; provincial participation could not exceed five per cent of the total provincial milk supply quota (MSQ). All dairy farms are eligible to participate in these two programs, provided they can fulfil their milk quota commitments. These export market niches are usually low volume, expensive to service, and the farm milk prices are significantly lower. Therefore, producer participation very much depends on their milk production cost and the economic feasibility of expanding production to supply the lower price export market.

Throughout North America, the number of dairy farms as well as dairy cows have been declining. Due to increased cow productivity, total milk production has been increasing. Canada's dairy production records clearly reveal that average milk production per cow in Alberta ranked fourth behind British Columbia, Ontario and Quebec. The records show that on average, dairy farms in British Columbia have the most productive milking cows in Canada. The average milk production per cow in 1996 exceeded the Alberta average by 19.7 per cent. These records also reveal that in 1995, Alberta and British Columbia produced practically the same volume of milk, but Alberta required 8,000 more dairy cows to match total milk production in British Columbia. Alternatively, in 1995, the average dairy cow in British Columbia produced 22 per cent more milk than the average Alberta dairy cow.

A closer examination of provincial Dairy Herd Improvement (DHI) records paints a different and more optimistic picture of milk production in Alberta. Typically, dairy farms enrolled in the DHI program tend to be better managed. The DHI "official records" show that in the last few years, milk production per cow in Alberta has been increasing at a faster rate than in any other province. Indeed, the 1996 average milk production per cow in Alberta's DHI program ranked second, just 84 litres or less than one per cent behind front-runner British Columbia. The 1997 "official records" indicate that Alberta DHI cow herd

now ranks number one in milk production per cow, ahead of British Columbia by about one per cent.

Pricing of fluid and industrial milk in Alberta is set by regulations. The DCB sets the industrial milk price, based on the national target industrial milk price of the CDC. The Alberta Energy Utilities Board (AEUB) sets the provincial fluid milk price. Effective August 1, 1995, Alberta adopted the harmonized national milk standards system. The system recognizes five classes of raw milk, with the producer price varying with each milk class. With the adoption of Alberta's computerized formula price for fluid milk and the western pooling of industrial milk, all dairy farms in Western Canada are presently receiving the same fluid and industrial milk prices.

▪ **Milk Production Costs in Alberta, Canada and the USA**

According to the CDC annual dairy cost studies, in 1995 total production costs for Ontario and Manitoba dairy farms were lower than dairy farm costs in Alberta. Alberta dairy farms generally had the lowest operating costs, and a feed and/or labor cost advantage. It is noted that the CDC cost survey targets the most efficient low cost dairy farms. When these CDC costs were compared to production costs of efficient (**Top 1/3**) dairy farms in Alberta's Dairy Cost Study (DCS), the Alberta dairy farms had a decided feed and labor cost advantage, as well as the lowest cost of production. Throughout the review period, Quebec dairy farms consistently had the highest cost of production.

Production costs and returns for Alberta and US dairy farms were also compared. The US regions considered were North East, South East, Upper Midwest, Corn Belt, South Plains and Pacific coast. In 1994, dairy farms in the Pacific Region had the lowest milk production costs of the regions considered including Alberta. Alberta had a distinct feed cost advantage over dairy farms in the USA, but higher labor and capital costs negated the feed advantage, especially with respect to the Pacific Region. Milk production costs were about \$5 per hectoliter higher in Alberta than in the Pacific Region. However, Alberta dairy farm costs were lower than farm costs in the other US regions. Equally important, Alberta dairy farms reported average returns on equity of \$10.30 per hectoliter, compared to negative returns for dairy farms in all of the six US regions.

A comparison of a 1994 University of Minnesota report based on 1989 USDA dairy farm costs and returns survey data and 1989 Alberta dairy costs and returns data, indicated that **Top 1/5** Alberta dairy farms were less efficient than **Top 1/5** US dairy farms, particularly those efficient dairy farms in the Western US. Alberta's feed costs were about \$0.81 per hL above feed costs in the Western USA, and \$2 to \$3 per hL above feed costs elsewhere. Labour and other non-feed operating costs also significantly contributed to the difference in production costs. The current consensus opinion is that **Top 1/5** dairy farms in

the Western USA still has a competitive edge over **Top 1/5** dairy farms in other US regions and in Alberta.

To sum up, consideration of the more recent survey data indicates that Alberta dairy farms are more profitable than US dairy farms. Feed costs are typically lower in Alberta. Excluding dairy farms in the Pacific region, total production cost was lower in Alberta than US dairy farm costs. Moreover, **Top 1/3** Alberta dairy farm costs were only marginally higher than Pacific region dairy farm costs. The US farms cost estimates were based on a 73-cents Canadian dollar. At a 65-cents Canadian dollar, there was no difference in the average dairy farm costs between Alberta and the Pacific region. In this instance however, efficient Alberta dairy farms costs were well below Pacific region dairy farm costs.

Within Canada, efficient Alberta dairy farms also reported lower production costs than efficient dairy farms in other provinces. In light of the foregoing, it is reasonable to conclude that the efficient Alberta dairy farms are well positioned to compete with their counterparts in Canada and the USA.

▪ Dairy Processing in Canada and the USA

Trends in restructuring and employment in Canadian and US dairy industries are quite similar. The number of plants as well as total employment in dairy processing are on the decline. In Canada, employment in fluid milk plants has been declining at a faster rate. In the USA, total employment has been declining, but employment in industrial milk plants has been gradually increasing. While the production of industrial milk and milk products has been rising in the USA, the use of industrial milk in Canadian plants has been declining since 1988. Increased butterfat skim-off from fluid milk reduced the Canadian demand for industrial milk.

The Canadian dairy industry is concentrated in Quebec and Ontario. In 1995, 42 per cent of the **industrial milk plants** were located in Ontario, 30 per cent in Quebec and nine per cent in Alberta. Average *annual wages per employee* was lower in British Columbia and Ontario. However, in terms of combined wages and salaries, Alberta industrial plants had the lowest *annual payroll per employee*, and Quebec and Ontario the highest. The combined average annual wages and salaries per employee was lower in the USA than in Canada.

Regarding **fluid milk plants**, one-third of the plants are located in Ontario, 21 per cent in Quebec, 16 per cent in British Columbia and six per cent in Alberta. The combined average annual wages and salaries were substantially higher in British Columbia relative to other provinces and the USA. US fluid milk plants had the lowest wages and salaries followed by Alberta fluid milk plants.

In 1996, Quebec plants accounted for approximately 47 per cent of the total industrial milk processed in Canada, Ontario 31 per cent, Alberta seven per cent and British Columbia five per cent. Average *throughput per plant* was highest in British Columbia, followed by Quebec. The average throughput per plant in these two provinces was more than double the volume from other provincial plants. British Columbia, with its average throughput of 55.2 million hectoliters per plant, processed twice as much industrial milk as the average Canadian and US industrial milk plant.

Of the total 1996 Canadian fluid milk production, Ontario plants processed approximately 37 per cent, Quebec 25 per cent, British Columbia 13 per cent and Alberta 10 per cent. In 1995 Alberta reported the largest fluid milk throughput per plant, 46.2 million hectoliters, significantly above the average for Canada and the USA.

Canadian production of ice cream, cheddar cheese and yogurt have trended upwards between 1981 and 1996, while the production of butter and skim milk powder for human consumption has trended downwards over the same period. Quebec is the major manufacturer of cheese, yogurt and skim milk powder. It has increased its market share of cheese at the expense of Ontario, but has lost significant market share in powdered skim milk, butter and, to a lesser extent, yogurt and ice cream. Ontario, on the other hand, continued to dominate the ice cream market, and has been increasing its market share of ice cream, butter, skim milk powder and yogurt. Alberta has made some small gains in ice cream and butter.

The average value of industrial shipments and other *revenues per plant* in 1995, i.e., average returns, was highest in Quebec and surprisingly lowest in British Columbia. Average *returns per employee* as well as average *returns per dollar of wages and salaries* were highest in Quebec, followed by Alberta then Ontario. Average *returns per \$100 of material costs* ranged between \$126 in Quebec to \$151 in British Columbia.

Although the average US industrial milk plant processed about one-quarter more industrial milk than the average plant in Alberta and Ontario, returns per plant were significantly lower in the USA. Similarly, returns per employee were slightly lower than in Alberta. On the other hand, the average US industrial milk plant generated greater returns per \$100 wages and salaries, while returns per \$100 of material costs were similar to Alberta's. (The reported value of shipments for British Columbia seemed to be underestimated and require further examination).

▪ Dairy Processing Margins and Profitability

In the absence of industry profitability data, the contribution margin was used as an indicator of profitability and competitiveness. Contribution margin is the

return over variable costs. It is the revenues left over to cover the fixed costs, and return on investment or profit. Contribution margin is typically used as a measure of business efficiency, as well as a benchmark to control production costs and generate revenues. Lacking data on fixed expenses, the contribution margin ratio was used as a reasonable proxy for profits and competitiveness in the dairy industry.

Quebec, Ontario, Alberta and British Columbia industrial milk plants reported positive contribution margins in 1991, 1994 and 1995. Quebec reported the largest contribution margin ratio of 35.4 per cent in 1991, but by 1995 this ratio fell to 12.5 per cent. In 1995 Alberta had the highest contribution margin ratio, 18.6 per cent, slightly above British Columbia. These estimates may suggest that business efficiency previously concentrated in Central Canada, is gradually moving westward to Alberta and British Columbia. US contribution margin ratios for industrial milk plants were relatively stable and greater than provincial ratios. Unlike the Canadian dairy industry, the contribution margin ratios for US industrial milk plants were greater than those of fluid milk plants.

Deloitte and Touche Consulting Group³ has documented the poor performance of Canada's food processing industry and the increasing good performance of the dairy processing industry. Whereas profitability in the US food processing industry has been trending upwards, profitability in Canada's food processing industry has been declining. Deloitte and Touche also noted that profitability in Canada's dairy processing industry has been increasing. Indeed, in 1995, profitability in Canada's dairy processing industry exceeded profitability in the Canadian food processing industry.

The 1995 Deloitte and Touche study attributes the poor performance of Canada's food processing industry to a number of factors, including the inability of food processors to increase prices, stiff competition for shelf space, and rising material and labor costs. As well, Canadian food processors face stiff competition from private brands, the quality of which has now reached an acceptable level of consumer satisfaction. Finally, Canadian food processors lack sufficient size to capture potential benefits from scale economies. In light of these findings, the performance of the Canada's dairy processing industry is noteworthy.

▪ **Results of Regional Equilibrium Analysis**

The regional equilibrium model solution suggests that if all border restrictions were immediately removed leading to a complete free trade environment, all provinces could lose market share to the US dairy industry. It was estimated

³ Deloitte & Touche Consulting Group, Bench Marking For Success, 1996, personal communication.

that milk production could decline by 14 per cent in British Columbia, nine per cent in Manitoba, Alberta and Ontario, and six to seven per cent in Saskatchewan and Quebec. The biggest potential negative impact was on the dairy processing sector. Dairy processing could drop by 26 per cent in British Columbia, 22 per cent in Ontario, 18 per cent in Manitoba and 15 per cent in Saskatchewan. Alberta and Quebec could experience a drop of nine to 10 per cent.

Recent market reports reveal that prices for milk products in some US markets exceed Canadian prices. This is more than likely a short term relationship. Model results also indicate that over time, there will be an inflow of US milk products into Canada, which will put downward pressure on prices in the Canadian market. New York, Michigan and Pacific North West could significantly benefit through expanded milk production and processing. Despite having the lowest industrial milk price and the second lowest fluid milk price, California would be largely unaffected by the removal of impediments to commerce.

▪ Conclusion

It is more than likely that regulatory changes will be implemented gradually. Yet the timing of such changes will be critical. The equilibrium solution assumes that all border restrictions are removed simultaneously. This would be the worst case scenario from an adjustment perspective. It bears noting that the US dairy industry is operating under fewer direct production and pricing restrictions than the Canadian dairy industry. Immediate relaxation of trade rules could therefore give the US dairy industry an advantageous edge over the Canadian dairy industry. Moreover, as the USA continues to relax controls of its dairy industry, the more difficult the adjustment is likely to be in Canada.

New WTO disciplines seem inevitable and will likely impact the industry in undetermined ways. The USA and New Zealand have initiated trade actions against Canada's dairy pricing policies (Special Milk Classes and the Optional Export Program). The USA is also contemplating steps to eliminate federal Milk Marketing Orders (MMO's) and minimum classified prices by January 1, 2000. Other competitors and potential competitors are likely gearing up for international competition. Canada's dairy industry needs to keep pace with and continue to adjust to the changing trade environment. **Timing** of regulatory changes and industry adjustment in Alberta and Canada will be very critical to future industry success.

If the inter-provincial impediments can be removed well in advance of the removal of national border restrictions, the Canadian dairy industry would have some time to restructure, rationalize and forge appropriate alliances to achieve scale economies. As the Deloitte and Touche report points out, growth opportunities are limited in Canada. Therefore the Canadian industry should be looking to export specific products to markets such as the USA, South Africa, China, Pacific Rim, South America and the Caribbean. Clearly, growth opportunities in these markets will be better realized if the industry is less fragmented and firms are of sufficient size to meet the expected US and global competition.

As previously mentioned, the dairy industry is concentrated in Ontario and Quebec. However, as inter-provincial impediments to the mobility of milk production, supply and processing disappear, there is significant potential for growth in other provinces. Alberta dairy farms could benefit by working to more quickly improve milk cow productivity and reducing milk production costs. Top management Alberta dairy farms have demonstrated capability of competing at such efficient levels of performance. They have also demonstrated a capacity for responding to new management challenges. The US Pacific Region has a cost advantage, but environmental constraints to expanded milk production, transportation costs and the nature of the product, may be critical factors affecting the flow of milk and milk products from that region into Canada.

It is recalled that the estimated US cost advantage was based on a 73-cents dollar. As the dollar falls towards 65-cents, the cost advantage in the Pacific region disappears, and efficient Alberta dairy farms assume the cost advantage. In light of the foregoing, efficient Alberta dairy farms are in a favorable position to take advantage of new domestic as well as NAFTA and WTO trade rules that affect the dairy industry.

Regarding the dairy processing industry, indications are that this industry is on the move in Alberta. For example, the consolidation of Western Canada ice cream production in Alberta recognizes that Alberta has lower labor and energy costs, ample high quality feed supply, and a potential for greatly expanding milk production at reasonable cost. The industry is also keenly interested in moving up the value chain. All three western provinces are using Alberta's formula price as the basis for setting their Class I milk price. A protocol for pooling Western Canada milk supply has been implemented. Indeed, Alberta exported proportionately more product than other provinces under the March 1995 Optional Export Program.

The continued success and future growth of the dairy processing industry are intimately and mutually linked to continued growth and success of dairy farming in Alberta. Efficiency gains in the milk processing sector very much depends on the supply and cost of raw milk. Dairy farmers in Alberta and Western Canada, and dairy processors need to come together as a team with one common vision that transcends provincial boundaries. At the same time, dairy farmers in Alberta will need increased public and private investment in research

directed at rapidly increasing milk production per cow and reducing milk production costs. The industry will need such support for continued success into the 21st Century. The report identified both strengths and weaknesses, and provides a number of benchmarks against which future performance can be measured.

