

The Future of the Dairy Industry in Canada

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■ Introduction

Trade liberalization, market globalization, industrial and corporate competitiveness – these are terms that are now part of the everyday language of most producers and processors. The latest multilateral GATT agreement signed by 128 countries prior to January 1st 1995, now under the auspices of the World Trade Organization¹ (WTO), included the agricultural sector for the first time. This first agreement forced relatively modest changes in the way agricultural policy is conducted in Canada but it set pace for more profound changes, in particular for the supply managed sectors. There is now a strong and irreversible trend towards increased market liberalization, i.e. the reduction of tariff and non-tariff barriers. Policies that isolate the domestic market from international competition will increasingly be challenged. In fact, supply management in the dairy sector has already been challenged by the United States and New-Zealand. The decision of the WTO Panel was partly in favour of the complaining parties and adjustments to the marketing system had to be made. The Panel decision did not seem to satisfy the complaining parties because they are expected to file another complaint in February 2001. The outcome of this challenge is unknown but it may have significant repercussions on the Canadian dairy industry.

The dairy sector has been isolated from international competition for more than thirty years and the evolution of its structure and of its productivity has been largely affected by this market environment. However, with evident signs that the dairy sector will have to adapt to a more open economic environment, actions will have to be taken by industry stakeholders to ensure its survival in the medium and long run. The objectives of this paper are threefold:

- Introduce some indicators of how the structure and performance of the dairy sector have evolved both in Canada and the United States. This comparison will allow us to position the Canadian industry in relation to the

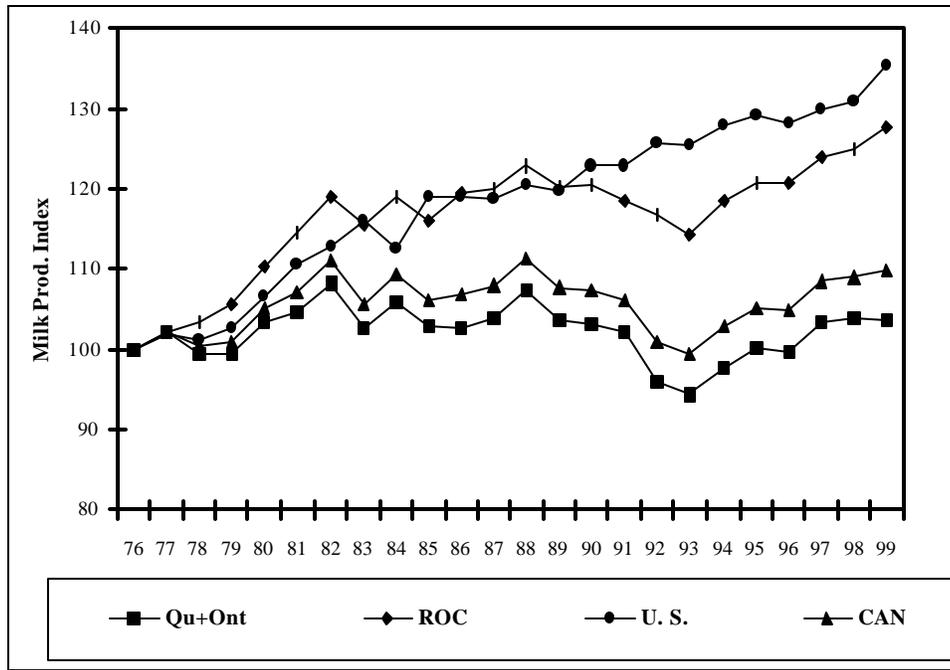
¹ As of November 2000, there are now 140 members of the WTO.

American industry, which will most likely be our main competitor due to its proximity, and also position the industry in the two most important producing provinces, Quebec and Ontario, with respect to the western provinces.

- ▶ Discuss some possible and reasonable results that we can expect from the next round of multilateral negotiations which have begun in March 2000.
- ▶ Point out the main challenges that, in my opinion, the industry has to face and discuss avenues that could be considered to ensure that the Canadian dairy industry survives and even grows and becomes stronger in the years ahead.

■ **Structure and Performance of the Dairy Industries in Canada and the United States**

Figure 1 shows that dairy production in the U. S. has continually increased over the last two decades. Between 1976 and 1999, production grew by 35%, from 54.5 to 73.8 million of metric tons (m.t.). Such an increase did not occur in Canada. Production increased by 11% between 1976 and 1982, remained at about the same level until 1988, and decreased by 11% between 1988 and 1993. In 1999, production is back to its 1988 level (7.7 millions m.t). This situation reflects a reduced per capita consumption which exceeded the rate of growth of the population.

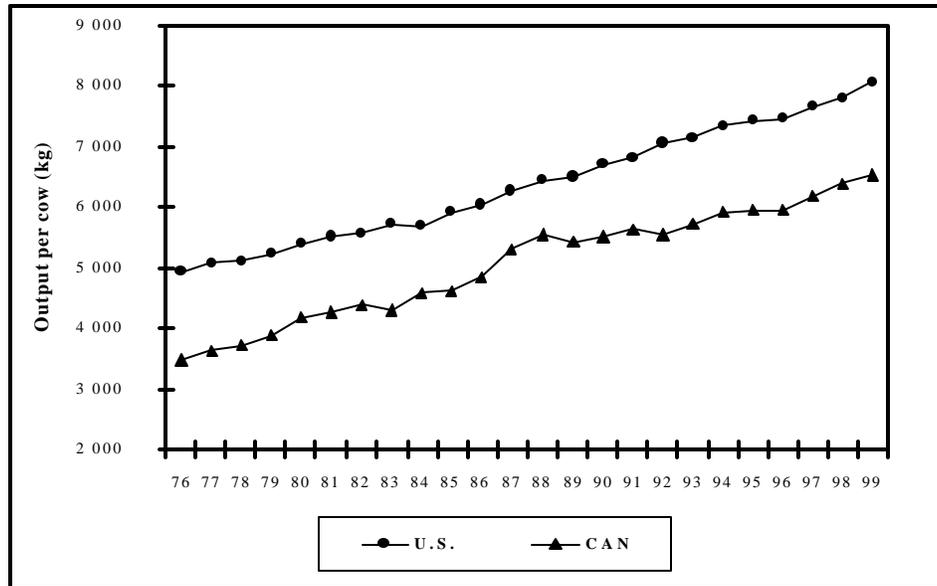


Source: Statistics Canada (CANSIM) and USDA (NASS)

Figure 1. Evolution of dairy production in Canada and the United States (1976-1999)

The national picture does not, however, reflect the evolution of milk production in the different regions of the country. It reflects mainly the evolution of milk production in Ontario and Quebec where 70% to 75% of the milk is produced. The rest of Canada experienced an upward trend similar to that in the U. S., although not as smooth since production declined between 1988 and 1993. Nevertheless, production increased by 28% between 1976 and 1999, and this increase is mainly due to an increase in the production of fluid milk.

The aggregate production increase in the U. S. has been accompanied by significant growth in cow productivity: output per cow increased by 63% over the 1976-1999 period (Figure 2). In Canada, the rate of growth in cow productivity was larger over the same period, i.e. 88%, but output per cow has always been lower than in the U. S. In 1999, output per cow is 8,060 kg in the U. S. while it is 6,540 kg in Canada, i.e. 23% higher in the U. S.



Source: Statistics Canada (CANSIM) and USDA (NASS)

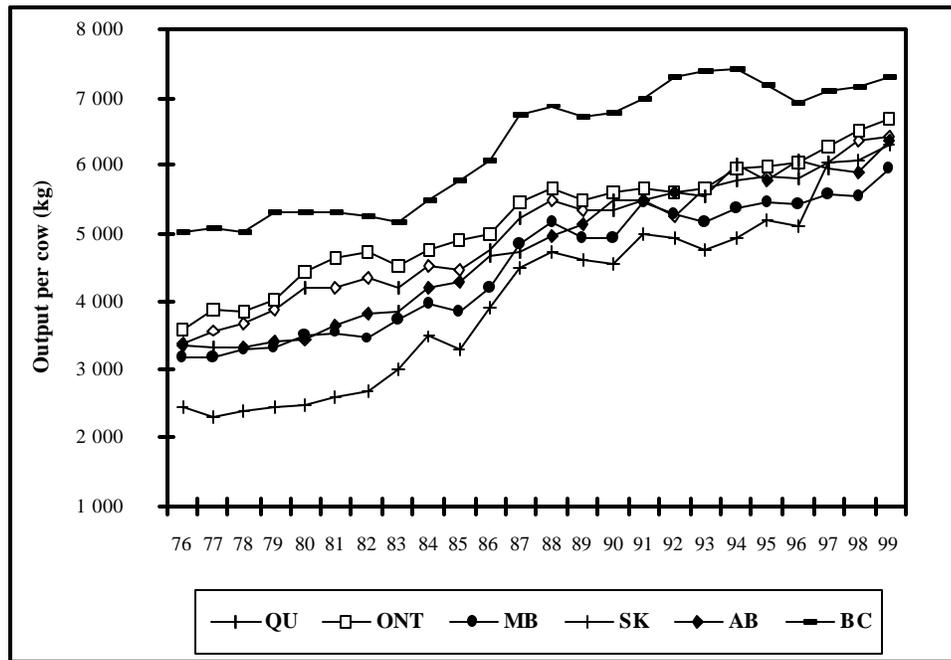
Figure 2. Evolution of output per cow in Canada and the United States (1976-1999)

Note that the higher output per cow in the U. S. is not necessarily a good indicator of the relative competitiveness or profitability of dairy farmers in both countries. In a quota system when quota prices are high, it could be more profitable to achieve a lower output per cow and use more cows when fixed equipment allows than to produce the same quantity of milk with a higher output per cow². This is due to the Law of Diminishing Returns. Increasing the output per cow requires a larger quantity of hay and concentrate while the marginal increase in production diminishes. Thus, it could become more profitable to use an additional cow to produce the quota, which makes it possible to lower the output of all of the cows and save on feed costs. It would be unwise, then, to use average output per cow to measure relative competitiveness.

Productivity growth in output per cow varied greatly between provinces (Figure 3). Quebec, Ontario, Manitoba and Alberta showed similar rates of growth ranging between 85% and 90%. Saskatchewan, which showed the lowest output per cow in 1976 (2,450 kg) experienced the highest rate of growth, i.e. 157%, while British Columbia, which had the highest level of output per cow in 1976 (5,020 kg) experienced the lowest growth, i.e. 45%. However, output per

² In this regard, see Knutson, Romain, Anderson and Richardson.

cow in B. C. has always been the highest in Canada, and it still is. In 1999, output per cow in B. C. reaches 7,300 kg followed by Ontario with 6,700 kg. In Quebec, Saskatchewan and Alberta, it varies between 6,300 kg and 6,400 kg. The lowest output per cow is observed in Manitoba at a little less than 6,000 kg. Note that in relation with the discussion in the previous paragraph, the large differences among provinces reflect that input and particularly quota prices vary from one province to another. Also, the mechanisms of quota transfer varied significantly over the years among provinces.



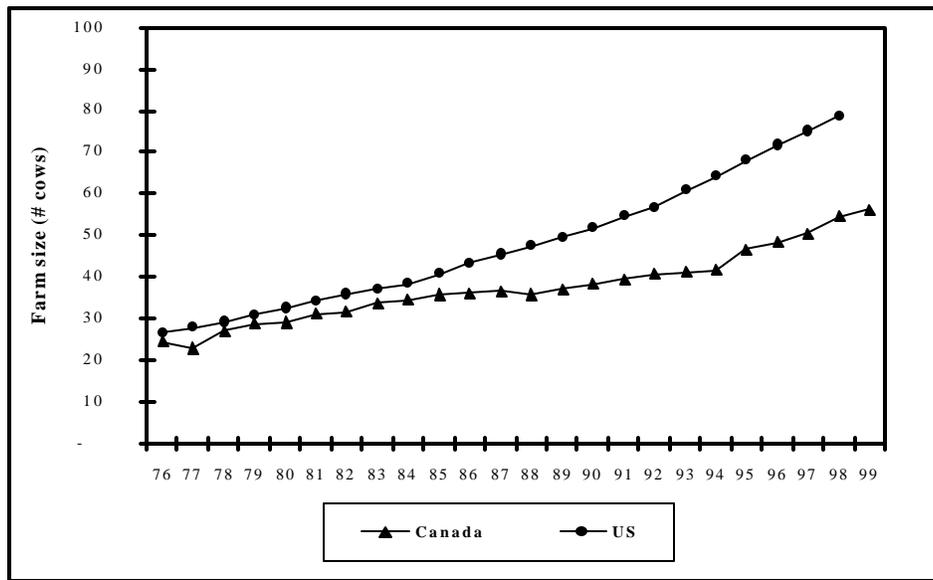
Source: Statistics Canada (CANSIM), and GREPA (2000)

Figure 3. Evolution of output per cow by province (1976-1999)

Farm size has been increasing rapidly in the U. S. between 1976 and 1999 (Figure 4). In fact, farm size tripled between 1976 and 1998: from 26.5 to 78.6 cows. In Canada, the increase was not as spectacular. From an average of 24.5 cows in 1976, which was similar to the farm size in the U. S., the average Canadian farm is now 54.5 cows in 1998, a 120% growth.

These figures suggest that the structure of the dairy sector in both the U. S. and Canada has been changing significantly, with changes being more important in the U. S. This drastic change is more evident when one look at the changes in

the distributions of farm size between 1986 and 1996, a ten year period only. Figure 5 shows that, in 1986, 95.7% of the farms in Canada had less than 77 cows and owned 83.3% of all cows. In 1996, there was still 94.2% of the farms that with less than 77 cows and they owned 80.7% of all cows. In the U. S., 90% of the farms had less than 99 cows and owned 58% of the cow herd. In 1996, the percentage of farms with less than 99 cows had decreased to 83% and they owned only 58% of the national herd. On the other end of the distribution, only 0.3% of the farms had more than 178 cows in 1986 in Canada, while they owned 2.3% of total cows. In 1996, both these percentages doubled: 0.7% of the farms had more than 178 cows and owned 4.3% of the national herd. In the U. S., there was a higher percentage of large farms than in Canada in 1986. In fact, 3% of the farms had more than 200 cows and they owned 24% of the national herd. In 1996, both of these percentages almost doubled: 6% of the farms had more than 200 cows and owned 43% of the herd.

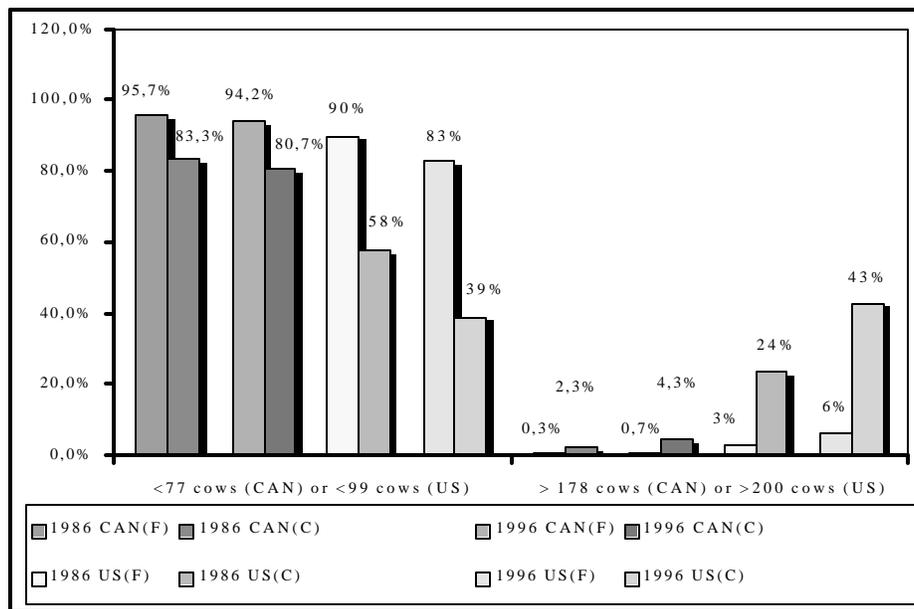


Source: Statistics Canada (CANSIM), and GREPA (2000)

Figure 4. Evolution of farm size in dairy production in Canada and the United States (1976-1999)

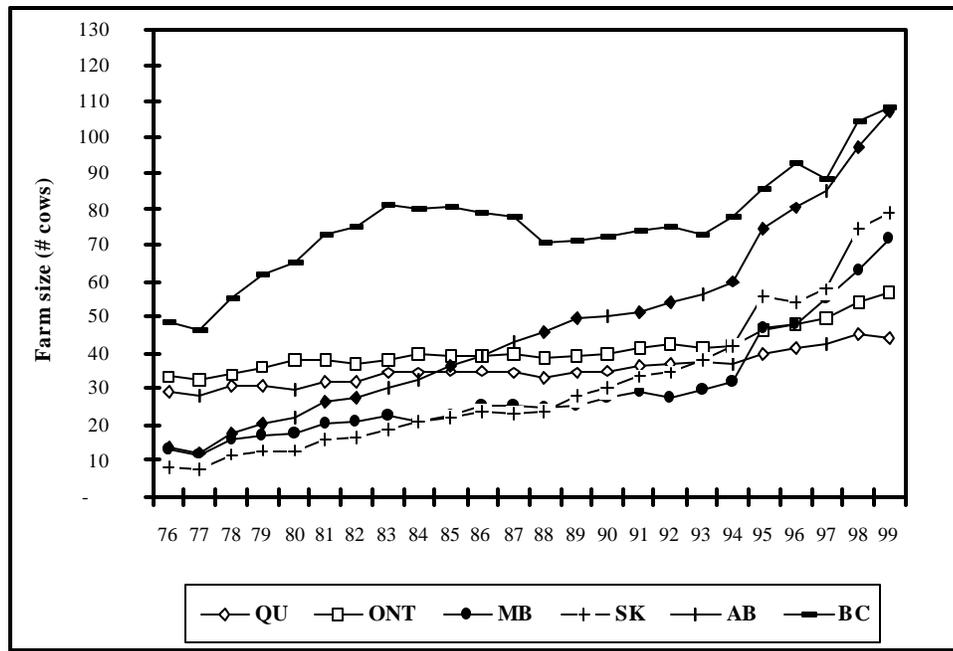
The previous numbers indicate that supply management has not precluded significant structural changes from occurring in Canada. The structural adjustments have, however, been slower and less important than in the U.S.

The structural change that occurred in farm size differed significantly among provinces (Figure 6). Drastic changes have occurred in some provinces while they were moderate in others. An interesting fact is that the lowest rates of growth occurred in the two most important milk producing provinces: Quebec and Ontario. In 1976, farm size was, by far, the largest in B. C. with 48.5 cows, and Ontario and Quebec followed with 33.5 and 29.1 cows respectively. In 1999, farm size in B. C. has grown by 123% (2.3%/year) to reach 108.3 cows. In Quebec and Ontario, farm size increased by only 52% and 70% (1.76% and 1.82%/year) respectively to reach 44.3 and 56.8 cows, and they are now the two provinces with the smallest farm size. Over the same period, the average farm in Alberta increased by 650% (8.3%/year) from 14.2 cows in 1976 to 107.5 cows in 1999, which is now the same farm size as in B. C. The most significant growth occurred in Saskatchewan with a 850% (9.1%/year) increase, from 8.3 to 78.8 cows per farm. Farm size in Manitoba also increased significantly from 13.3 to 71.5 cows, a 435% (6.2%/year) increase. In terms of economies of size, the evolution of the structure of farms now suggest that farms in western Canada have a certain competitive advantage over farms in Quebec and Ontario.



Source: Statistics Canada (Census of Agriculture), and USDA (NASS) Agricultural Census.

Figure 5. Evolution of dairy farm structure, Canada vs United States



Source: Source: Statistics Canada (CANSIM), GREPA (2000)

Figure 6. Evolution of farm size per province (1976-1999)

The preceding analysis, based on sectoral data, must be interpreted with caution in analyzing relative competitiveness because, although it conveys the average behaviour of the indicators used, increased industry competitiveness will most likely come from producers who are already the most efficient in the industry. For several years, a group of researchers from the Agricultural and Food Policy Center of Texas A&M University have conducted a research project to analyze these businesses. Their research project focuses on analyzing farms that are likely to be representative of the dairy industry over the next few years. It involves two groups of five to eight farmers who have medium size and large farms respectively. These farmers are asked to construct an efficient model farm that does not exactly represent their own business but which, based on their experience, represents an efficient farm of that size in their region. These model farms are then used to simulate different agricultural policy scenarios and participating farmers are given the results of these analyses.

Table 1. Characteristics of representative Quebec, New-York and Vermont dairy farms

	Quebec		New York		Vermont	
	Moderate	Large	Moderate	Large	Moderate	Large
No. of cows	70	125	110	300	85	350
Milk prod. /cow (hl)	70	77	97	95	99	97
No. of hectares	123	165	140	485	101	303
Assets/cow without quota	10,786	12,329	7,373	6,613	10,379	7,023
Assets/hl without quota	154	160	76	70	105	72
Assets/cow with quota (1996-2002)*	20,786	21,993				
Net cash farm inc./hl	23.70	27.57	8.09	16.36	20.28	12.16
Net cash farm inc./cow	1659	2123	785	1554	2008	1180
Net cash farm inc. /assets (no quota)	0.15	0.17	0.11	0.24	0.19	0.17

*Simulation period for net cash income

Source: Knutson et. al.

A few years ago, this group of American researchers contacted several resource persons in Canada in order to conduct similar analyses in the different provinces. Some provinces or producers associations did not participate in this study for different reasons but two groups of producers in Quebec agreed to participate in this exercise. Table 1 presents some descriptive characteristics of these representative Quebec farms and of representative farms in the states of Vermont and New York.

The size of the representative Quebec farms was determined in consultation with members of management clubs. They decided that an "efficient" medium size farm has 70 cows while a large farm has about 125 cows. It should be noted that the representative farms used in the American states adjacent to Quebec were significantly larger, especially the large size farms.

In regard to output per cow, there is very little difference between the different size farms in the United States while, in Quebec, the output per cow on large

farms was 10 % higher. It should also be noted that the output per cow in Quebec is much lower than that of American farms.

Aside from the quota, the asset value per cow is slightly higher in Quebec than in the American states, except for the medium size farm in Vermont which shows an asset value per cow similar to that of the same size farm in Quebec. If we add the quota value, the investment per cow in Quebec is over \$20,000. When measured in terms of production, the difference between the Quebec and American farms is much greater. For representative medium size farms, the asset value per hectolitre is \$154 in Quebec compared to \$76 and \$105 in New York and Vermont, while for large farms, these values are \$160, \$70 and \$72 respectively.

These models were used to simulate business performance by using the FLIPSIM model developed by Richardson and Nixon (1986). The simulations covered the period from 1996-2002 and the results in terms of average net dollar income are presented in Table 1. These simulations assumed that the same policies would remain in effect during that period, that is, supply management in Canada and a more open market in the United States.

The Quebec farms show a clearly higher net cash income per hectolitre than the American farms. However, since the output per cow in the states of New York and Vermont is much higher, the difference between the net cash income per cow is much less. In fact, the large farm in the state of New York and the medium size farm in Vermont show a net cash income per cow comparable to that of the Quebec farms. Since the net dollar income is used to pay the operators and add to the owners' equity, and since these representative farms are all supposed to have the same debt level, it is also interesting to compare the ratios of net dollar income per asset value. This indicator shows that by excluding the quota value from the calculations, the yield of the Quebec farms is comparable to that of the American farms. This result is interesting because it shows that even though the income per hectolitre is higher in Quebec, the lower output per cow combined with a higher asset value per cow ensures that the farms are really no more profitable than those in the adjacent American states. I mentioned before that supply management could help to explain the lower output per cow in Canada as compared to the United States. Could it also help to maintain the asset value at a higher level?

■ **Important Issues for the Dairy Sector in the Next Round of Multilateral Negotiations**

Agricultural sectors throughout the world have developed under very different conditions of government support and agricultural policy. The fact that 140 countries have now agreed to submit their agricultural sectors to a set of

trade rules, then, is quite a feat. They have recognized that price wars such as those we have seen since the early 1980s did not benefit any country and the costs involved could certainly be put to better use elsewhere. However, it is not reasonable to expect full trade liberalization after only two rounds of multilateral negotiations.

There are three main trade issues in the current negotiations: market access, export subsidies and domestic support. The two major players are the United States and the European Union, as it was the case in the previous negotiations. Both have put forward their comprehensive negotiating proposal which, as expected, vary significantly^{3,4}.

The trade issue that most concerns the dairy sector is market access. In Europe, there are still a large number of small farms and governments are not prepared to impose draconian structural changes. Protection of the small family farm, self-sufficiency and occupation of the territory are priorities that the public is not prepared to abruptly drop. So, the initial position of the members of the E. U. favours increased market access but with provisions that link trade and non-trade concerns (labelling, designations of origin, ...). The E. U. proposes to clarify the administration of the Tariff Rate Quotas (TRQs) volumes but it is implicit that it does not favour increased volumes. Overall TRQs tariffs should be reduced from bound levels with a minimum reduction per tariff line, as was the case in the Uruguay Round, in order to keep the flexibility in tariffs reduction. Finally, the E. U. proposes to keep the Special Safeguard Clause (SSC) which allows a country to increase bound tariffs when there is a sudden and unpredictable increase in imports. In fact, the initial negotiating position of the E. U. proposes very modest changes, and is not far away from the status quo.

In the United States, agriculture is increasingly becoming an industry like the others where production control, marketing and distribution are in the hands of an increasingly limited number of large companies. The U. S. initial position reflects this and seeks to maximize market access opportunities. It involves substantial reduction of all tariffs as well as increases in TRQs volumes and specific mechanisms to correct for unfilled volumes. The U. S. also proposes to eliminate the Special Safeguard Clause.

The final outcome of this second round of negotiation will be somewhere between the two extremes but it is likely to have a more significant impact on the Canadian dairy sector than the first round.

³ See World Trade Organization, Committee on Agriculture, February 5 - 7 2001 and June 29 - 30 2000 meetings http://www.wto.org/english/tratop_e/agric_e/negoti_e.htm#proposals

⁴For a comprehensive analysis of the impact of the initial negotiating positions of the U. S. and the E. U. on Canada, see Rude and Meilke.

At a recent symposium on Dairy Policy and Trade⁵, the results of several scenarios on the impact of trade liberalization were presented. In particular, Zhu, Cox and Chavas (ZCC) (1999) presented a scenario that assumed complete trade liberalization in the world dairy sector. The results suggest that producers around the world would lose up to \$US10 billion, which would be recuperated by consumers through lower prices for dairy products. Note that producers in some regions of the world would gain from freer trade (Western Europe (\$US6.6 billion), Oceania (\$US1.1 billion)). Interestingly, these results help to understand the initial negotiating positions of the two major players. Western Europe dairy farmers would lose up to \$US14 billion while the expected welfare loss of U. S. farmers is only \$US0.74 billion. In Canada, ZCC estimate the producer loss to be around \$US1.0 billion while Larivière and Meilke (1999) estimate a slightly higher loss, i.e. \$CAN1.8 billion. Note that the producers loss coming from reduced production is marginal; it is mainly attributed to lower milk prices and to significant reduction in quota values.

More probable scenarios than free trade were presented by Cox, Coleman, Chavas and Zhu (CCCZ) (1999). These scenarios were based on an extension of the current WTO agreement until 2005, assuming that the agreed reductions on import tariffs, import quotas, export subsidies and combinations of them were linearly extended until 2005. Their results suggest that Canadian dairy farmers would lose between \$US54 and \$US120 million. Of course, these results assume no major changes in the Canadian dairy policy. It is, therefore, imperative to modify the Canadian dairy policy to avoid such potential losses.

Finally, the WTO trade negotiations are not the only source that will exert pressure on supply management in the near future. The negotiations concerning the Free Trade Area of the Americas (FTAA) will certainly require relaxation of supply management policies. In the following section, I discuss the major constraints to increasing the competitiveness of the Canadian dairy sector and suggest avenues that could be further investigated to improve its performance and insure its long term viability.

■ Constraints Facing the Canadian Dairy Industry and Potential Solution Avenues

The Canadian dairy industry has changed greatly over the last decade, a fact which shows that the industry is capable of adjusting to new operating rules. At the end of the second round of multilateral negotiations, it is undeniable that more adjustments will be required. Note that an increase in the minimum

⁵ The proceedings of this research symposium organized by the Center for Agricultural and Rural Development at Iowa State University and the Agricultural Issues Center at the University of California – Davis, held October 8-9, 1999, Kansas City, Missouri, are published in a special issue of the *Canadian Journal of Agricultural Economics*, December 1999.

access requirement (TRQ) does not mean the end of supply management. Actually, the supply management system could be an excellent system to insure that the dairy industry adapt in an orderly manner to a new economic environment, while maintaining significant market power in the hands of producers. However, adjustments are required because it is inconceivable that the industry (producers and processors) decides to decrease Canadian production at the same rate as the increase in the TRQ. In fact, Rude and Gervais (2000) have shown that if farms prices were to be kept at a constant level following an increase in the TRQ, the required decrease in production will imply i) a decrease in farm revenue, ii) a likely decrease in the aggregate value of quota even though the per unit quota price will increase, and iii) a potential increase in the retail price of dairy products caused by the reduction in milk supply required to sustain the farm price, result that may not be well received by consumers.

There are two important constraints that slow down the development of the industry. The first deals with the mechanism for transferring quotas, both within the provinces and across provinces. The second is linked to the development of new markets.

The Mechanism for Transferring Quotas

A minimum price for industrial milk is set by the Canadian Dairy Commission and this remains the same Canada-wide, whatever the comparative or competitive advantages may be, or whatever the efficiency levels of the producers or processors in the various regions. The fixed nature of the provincial allocations of industrial milk quota that is based mainly on historical shares, as well as the fact that prices for fluid milk vary only minimally among provinces, have resulted in economic forces being expressed through different prices for quotas and fixed assets in each province, and through profitability levels for processors that also probably vary by province.

This law of one price makes it difficult to develop those famous niche markets which everyone has been talking about, particularly since the work of the Canadian Task force on Competitiveness in the Agri-Food Sector at the end of the 1980s. It affects the relative competitiveness of producers as well as that of processors, and it has a major impact on the development of the industry though its effect on quota prices.

At the producer level, the current mechanism of quota transfer, i.e. auction sales, does not encourage increases in efficiency. In fact, any improvement in efficiency generally translates into a production increase, which necessitates the purchase of additional quota. Given the high price of quotas, achieving the profitability threshold for the purchase of additional quotas may be conditional on an increase of 10 % or 15 % in a producer's efficiency. However, an increase in efficiency is not generally immediate, and this implies that the

producer would have to accept short-term financial losses while continuing to be uncertain as to whether he could achieve an adequate efficiency threshold for making his investment profitable. It is, therefore, very unlikely that this producer would be inclined to increase his efficiency⁶.

In order to improve the competitive position of producers, it should be the case, therefore, that efficiency gains, which are different from increases in production obtained by a greater use of inputs, would be immediately profitable for the producers, i.e. that the quotas would be made available to them. It is evident, that these additional quotas would have to come from somewhere. A potential solution to this problem could be holding back a significant percentage of the quotas sold on the quota markets. Certain provinces have used this mechanism to facilitate the transfer of farms between generations or the arrival of new producers in the sector. This holdback rate could gradually be increased to 50 % or more depending on the needs, and this within a relatively short time-frame. These quotas could be redistributed on a pro rata basis to efficiency gains, measured by suitable criteria. It is certain that a policy of this type would not be welcomed warmly by those leaving the sector, but we need to invest in those who are remaining to achieve its development.

To rationalize the industry Canada-wide and increase its competitiveness, a system of inter-provincial transfers should also be established. At this time, there is no longer an operating inter-provincial quota market. Such a market has been in operation a few years ago between few provinces but it is no longer operational because some provinces were losing too much of their market share. It is evident that all provinces do not have the same competitive and comparative advantages in dairy production and geographical concentration should be allowed to occur.

Objective criteria based on comparative regional advantages could also be implemented in the allocation of the national MSQ to facilitate industry rationalization. These criteria should not solely be based on relative costs between provinces as the sole factor conveying competitive advantages, but they should also take into consideration the price levels that producers and processors are ready to accept to obtain a larger share of the national quota, which also translate into comparative advantages. For example, the cost of production in Quebec and Ontario is generally higher than that in western Canada, and quota prices are also higher. Such a mechanism could be operational in a relatively short time-frame. It is evident that such a modification to the national dairy policy would have significant implications for the industrial milk sector, and in particular for processors who would no longer be assured of a relatively fixed quantity of milk at the provincial level; but if the primary sector changes, the processing sector also will have to change.

⁶ For a detailed analysis of efficiency, see Romain and Lambert.

Conquering Markets

The second major constraint that the dairy sector has to address is that of conquering markets. Given the trend in demand in Canada, which, as seen previously, has decreased significantly on a per capita basis over recent decades, growth in the industry will only be possible through the export market. The optional export program that was developed some years ago as well as the special class pricing mechanism has been contested by the United States and New-Zealand. Following the WTO Panel decision that agreed, in part, with the U. S. and N. Z complaints mainly because the government (CDC) was involved in the export program, a new export mechanism has been elaborated by producers. This mechanism is again going to be contested by the U. S. and N. Z. and the probable reason is because this program discriminates on prices for milk depending upon whether the consumer is in Canada or abroad. The results of this dispute will have significant impacts for the sector, whether these favour or are contrary to Canada's position.

However, let us assume that the decision goes against the Canadian position. This does not necessarily imply the end of an optional export program because exports made under the special classes 5(a), 5(b) and 5(c) are accepted by the WTO: the milk used to produce the dairy products is paid the same price whether the product is sold on the domestic market or abroad. Therefore, it would then be opportune to consider the option of targeting certain lines of dairy products, which enjoy a potentially strong demand abroad and which do not constitute a significant portion of milk utilization in the domestic market (such as certain specialty cheeses for example), and to sell these at the same price on the domestic market as on the export markets. To reduce the risk associated with production, futures markets could be used to secure a price⁷. There would certainly be an increase in the quantity demanded for these products in Canada, but this would not be enough to compensate for the decrease in price. Nevertheless, the increase in the quantities exported could be more than sufficient to compensate for the decrease in price, thus increasing total farm revenues coming from the sale of these products. A rigorous analysis of such a solution could certainly be considered.

■ Conclusion

In conclusion, it seems that over the short term, the Canadian dairy sector cannot be competitive with the American dairy sector. The two sectors have developed in very different economic and political environments over the last 30 years. However, there is a need for the Canadian sector to be in a position to compete with the American dairy sector over the medium term and to achieve

⁷ For a thorough analysis regarding the use of futures markets as an alternative to reduce risk in the dairy sector, see Romain and Turvey.

this, it must accept a certain level of rationalization. We are already seeing certain companies, including Saputo and the multinational company, Parmalat, anticipating an opening-up of the Canadian market and implementing appropriate strategies.

I have shared with you today my thoughts on some possible avenues for improving the competitive position of the dairy industry in Canada. There is, however, a need to be realistic and to recognize that, in the unavoidable process of rationalization, there is no development strategy that will only produce winners. However, if we do not want there to be only losers, decision-makers will need to decide upon common strategies as soon as possible. I believe that, due to the market power given to producers by supply management, this system is an excellent mechanism to implement significant policy changes and insure the development and growth of the industry.

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