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PROSPECTS FOR THE CANADIAN DAIRY SECTOR FOLLOWING THE UPCOMING NAFTA PANEL RULING

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On October 3, 1987, Canada and the United States signed a Trade Agreement (CUSTA) which came into force on January 1, 1989. Included in this agreement, all tariffs on dairy products which were not on the Import Control List (ICL) subject to GATT rules were to be eliminated over ten years. Products not included on the list at the time of signing the agreement included ice cream and yogurt. Canada added these products to the ICL early in 1988. A GATT Panel ruled that such action was illegal basically because these processed products were not considered to be "like products" to raw or liquid milk to which the Article XI provisions of the GATT applied, provisions that allowed import quotas if certain restrictive conditions were met. Canada refused to withdraw these products from the ICL, deferring action on this issue until GATT negotiations were completed. Canada argued that GATT Article XI would be made more restrictive, thus legitimizing its action.

In 1992, Canada signed the North American Free Trade Agreement (NAFTA) which involved three bilateral agreements among the three partners. The CUSTA was folded into the NAFTA as the bilateral agreement governing trade between Canada and the United States.

As a result of the Uruguay Round Agreement (URA) of the World Trade Organization (WTO, formerly the GATT) signed at the end of 1993, all quota and non-tariff barriers have to be translated into tariff-equivalents. In addition, export subsidies and subsidized volumes have to be gradually reduced over a period of 6 years starting August 1, 1995. Minimum access commitments are also established. Tariffs for specific supply managed products and processed products manufactured with the raw commodities were proposed by Canada and were accepted by all parties, including the United States. It is clear that the tariffs under the URA are very high and as a consequence, imports of dairy products and other supply managed products will be practically impossible until the next round of negotiations. However, there has arisen a difference in opinion between Canada and the United States regarding the application of NAFTA provisions to the tariffs created in the URA. The United States seems to argue that Article XI is no longer in the multilateral Agreement, that Canada has signed NAFTA which extended CUSTA for agriculture, and therefore Canada should

eliminate all tariffs on agricultural products by January 1, 1998 as stipulated by Article 402:2 C in CUSTA. The underlying question is whether Uruguay Round Agreement (URA) tariffs that arose from the tariffication of previous non-tariff barriers fall under the disciplines of the NAFTA, or whether they are unaffected by that Agreement. A NAFTA dispute settlement panel, the first dispute heard under Chapter 20 of the NAFTA, has been convened to resolve this conflict to determine which trade agreement takes precedence.

Since the outcome of the dispute will not be known until the end of June at the earliest, the objective of this paper is to investigate the medium term implications, say over the next five years, of possible outcomes for the Canadian dairy sector. We will first discuss the case where the NAFTA Dispute Panel rules for the Canadian position. The alternative scenario assumes the U.S. position, that NAFTA dominates over URA, is upheld. In this second scenario, we will assume a series of smaller changes, however likely or unlikely they may be. First, however, the next section summarizes the role of the Canadian Dairy Commission (CDC) while the following section presents the recent modifications that have been made to the Canadian dairy policy and programs. These recent changes were not presented in the introductory paper by Agriculture and Agri-Food Canada, but they are important in analyzing the short-medium term evolution of the Canadian dairy sector.

THE CANADIAN DAIRY COMMISSION

Role of the Canadian Dairy Commission

The Canadian Dairy Commission (CDC) was established in 1966 by virtue of the Canadian Dairy Commission Act. The CDC is a crown corporation which administers the National dairy policy and its two objectives outlined in the Act are *"to provide efficient producers of milk and cream with the opportunity of obtaining a fair return for their labour and investment capital; and to provide consumers of dairy products with a continuous and adequate supply of dairy products of high quality."* (CDC Annual Report, p.16).

The Canadian dairy sector has been under supply management for over twenty five years.[1] The national plan which established the aggregate national quota (market sharing quota MSQ) for industrial milk was signed in December 1970 by the CDC, the provincial governments of Ontario and Quebec, as well as by producers representatives of these provinces. The other provinces gradually joined the national plan and all provinces had

[1]See Coffin et al (1994) and Gouin (1987) for excellent descriptions of the origin and evolution of the Canadian supply management system.

signed the plan for the dairy year starting April 1st, 1974[2]. National quota is allocated to provinces according to historical market shares. The provincial quota is distributed among producers according to provincial legislation or regulations. In most provinces, a public quota exchange market exists and quotas are traded among producers.

To administer the National Dairy Policy, the CDC is responsible for setting the national MSQ which reflects estimated domestic requirements at the going price, as well as a small percentage of domestic production which is exported to the United Kingdom. To assure a "fair" return to producers, the CDC sets a target price for milk, which is partly based on calculated average costs of production using survey data from Quebec, Ontario, Manitoba and New-Brunswick, and it establishes support prices for butter and skim milk powder which, in conjunction with a direct federal subsidy, meets the target price. The CDC stores butter and skim milk powder in periods of overproduction relative to domestic needs and it also exports what is not needed domestically. Up to August 1995, the CDC was funding its operations through producers levies which were of two main types: "within-quota" and "over-quota" levies. These levies were paid by provincial marketing Boards and they were collected from producers through different means and levels specific to each province.

Recent Modifications to the National Dairy Policy

During the dairy year 1994-1995, sub-committees formed by the CDC worked heavily to adjust the national dairy policy and programs so they would be acceptable under the URA. This included substituting export levies collected from producers with another mechanism which would allow surplus production to be exported at world prices, and which would allow processors and manufacturers who use dairy constituents in products that are traded freely (or almost freely) on the world market to remain competitive.

A second major adjustment to the dairy policy is the elaboration of new Plans in the Offer To Purchase Program (OTPP), which should contribute to a more efficient allocation of milk among processors within a province and across provinces. This modification to the OTPP is coupled with the implementation of a national quota exchange market which will start its operations August 1, 1996.

The third significant modification is the implementation of an Optional Export Program (OEP) in order to take advantage of potential export markets. Each of the previous policy changes are further discussed in the next sub-sections.

From Levies to Special Milk Classes. Prior to August 1, 1995, the small export program as well as a few other programs administered by the CDC, programs which contributed to supply dairy constituents to processors who were operating in an internationally competitive environment, were financed with levies imposed on all milk produced within quota (within-

[2]Newfoundland has never signed the National Plan because dairy production is almost non-existent in this province.

quota levies). Exports of dairy products manufactured with over-quota production were financed with over-quota levies. These levies were collected on a per hectoliter basis. Therefore, the "costs" associated with the national export program and a few other "legitimate" programs were shared among all producers, while individual producers who exceeded their quota were responsible for exporting the surplus of dairy products[3] (mainly butter and/or skim milk powder).

In order to comply to the WTO Agreement, a new mechanism had to be developed since levies can no longer be collected from producers, and milk used for export or in rebate programs has to be paid the world price to producers. As of August 1, 1995, provinces agreed to share a common classification for milk into five classes. The first four classes are for milk used to process domestic products and the pricing of milk in these classes reflects domestic requirements at the going prices. Milk used into exported products or in rebate programs, as well as milk produced over-quota fall into class 5 and is priced according to world price.

Since the distribution of industrial milk production is quite unequal across provinces,[4] it was determined not to be equitable that only producers in provinces with a large share of industrial milk quota bear the "cost" of the system, which also covers fluid milk production, for the whole country. In order to share the cost among all producers, provinces have agreed to pool all milk revenues, including fluid milk revenues, at the national level and then redistribute revenues according to the provincial share of all milk production.[5] Therefore, after a breaking in period, all producers will receive the same price for milk and adjustments will be made for processors to pay similar prices also.

As will be discussed further in a later section, the pooling of revenues from all milk at the national level created the opportunity to implement a national quota market. As of August 1, 1996, three provinces have agreed to participate in a national quota market where up to one percent of the provincial share of total milk production quota could be exchanged.

The Offer to Purchase Program (OTPP). Until August 1, 1995, two Plans were used in the OTPP. Under Plan A, the CDC purchased, at the support price, all butter or skim milk powder that a processor would produce but could not sell on the market at a higher price.

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[3]The final part of this statement is needs qualification. Provinces were responsible for collecting levies from individual producers and some provinces would collect levies higher than those assessed by the CDC to dispose of the products on the world market. This was done to discourage over quota production.

[4]Quebec and Ontario produce close to 80 % of all industrial milk in Canada.

[5]Presently, only six provinces have agreed to pool revenues from all milk. A parallel agreement has however been signed by all provinces, excluding Newfoundland since this province is not part of the National Plan, and this agreement is on pooling only a fraction of total revenue from all milk. It is expected that the three provinces which have not signed yet the agreement will eventually do so after further negotiations.

Plan A acted as a surplus removal mechanism. Plan B was used by processors to regulate their sales during the year. Under Plan B, processors sold butter (or a few other specific products) to the CDC but had to repurchase the product within one year at the same price. This program was self-regulating and processors used it to avoid carrying charges associated with holding the stock. Consumers paid the carrying costs.

The CDC was purchasing butter or skim milk powder when a processor could not find a market for milk that had been processed. However, it was possible that another processor in the same province, or in another province, could have marketed this milk at a higher price.[6] Since August 1, 1995, purchases by the CDC under Plan A will be made only to ensure adequate supply to the domestic market during seasonally deficient periods. When an adequate level of stock is reached, purchases under this Plan will be closed, as it is the case at the present time. The effective surplus removal program will henceforth be administered through two new Plans : Plan C and Plan D. When Plan A is closed, processors have to sell butter to the CDC under Plan C. For the CDC to purchase butter under Plan C, a processor has to declare its "surplus milk" before transforming it into butter, and the milk is offered to other processors in the same province, as well as to processors in the neighboring provinces. If the milk is not required by the other processors, then the CDC buys it at the world price and assures its disposal. Plan C has been put in place to insure that as much milk as possible could be sold in the domestic market at a higher value (Paquette, 1995). As of today, this Plan is not fully operational.

Purchases under D are used exclusively for conducting the small export program. Levels of export are determined by the Canadian Milk Supply Management Committee and milk is paid at the world price.

Optional Export Program. In the summer of 1995, provinces agreed to establish an optional export program (OEP). The administration of the program is the responsibility of each province. A processor who finds a market for a product has to approach its provincial Board to secure milk supply, and he has to be supported by the Board in its request to the CDC. The provincial Board evaluates if it could supply the requested amount of milk at a negotiated price with the processor. The OEP is not yet operational: only Alberta has submitted a proposal for export to the OEP Supervisory Committee.

The three major modifications to the national dairy policy have been implemented in order to comply with the WTO Agreement and they are likely to affect the evolution and the structure of the Canadian dairy sector in the next few years. This will be the case even if the NAFTA Panel decision favors Canada's position. The anticipated impacts as well as the probable modifications to the Canadian policy and programs in that case within the next five

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[6]Such a situation within a province was not possible in all provinces. In Quebec for example, the marketing agreement between processors and the Federation des producteurs de lait du Quebec was such that processors could be supplied with as much milk as they required if they were not manufacturing butter or skim milk powder. Milk was sent to butter plants only as a last resort. Of course, butter plants were not always pleased with this agreeement, especially in situations of cuts in the provincial MSQ. A similar policy was also in effect in Ontario.

years are treated in the following section under Scenario one. Scenario two discusses the situation where the Panel decision is less favorable to the Canadian position.

IMPACTS OF CURRENT AND ANTICIPATED CHANGES IN THE CANADIAN DOMESTIC POLICYON THE STRUCTURE AND EFFICIENCY OF THE DAIRY SECTOR

Before discussing different scenarios, one has to realize that a common factor will affect all scenarios: a decrease in direct government support. Since the mid-seventies, the federal government contributed $6.03/hl to the target price. This support level was reduced by 10 percent in August 1993. In 1995, the federal government announced a further reduction of 30 over two years.

Scenario One: Panel Decision Favours the Canadian Position

A panel ruling in Canada's favour does not mean that pressures on adjusting the supply management system will end. All stakeholders in the industry are well aware that the next round of multilateral negotiation, which will start sometime in 1998, will certainly focus on a phase out scheme of the high tariff rates imposed by several countries on different commodities. However, due to the rigidity of the system, the impacts on the structure of the industry and on gains in efficiency at both the production and the processing levels are not expected to be large. Nonetheless, the recent modifications in the national dairy programs will allow economic forces to begin indicating where milk production and processing would concentrate in Canada in a freer trade environment. Moreover, the recent adjustments in the dairy programs will likely generate more pressure from producers themselves in order to further liberalize the industry in Canada within the next five years. The reasons underlying the above statements are presented in the following sub-sections.

Evolution of the Structure and Efficiency of the Production Sector. The background paper by Agriculture and Agri-Food Canada summarized the structure of the dairy sector. The major characteristics of the production sector are threefold. First, total milk production has remained at about the same level over the last thirty years, but the number of dairy farms has decreased significantly (Figure 1). Actually, the decrease in the number of farms during this period has been similar to that observed in the United States (ISTC 1991). Over the last twenty years, the average herd size in the two major producing provinces, Quebec and Ontario, has shown minimal increase, while the average herd size has grown slightly in the other provinces (Figure 2).

The second structural change that occurred over the last two decades is the significant increase in average yield per cow, which has kept pace with that observed in the United States as shown in Figure 3. However, average yield per cow in Canada has always been

lower than that in the United States. Some could argue that this may be due in part to supply management, especially when one notes that the gap between yields in Canada and in the United States has increased since 1989 when significant cuts in the national MSQ occurred. When farmers increase their productivity per cow, they have to purchase the equivalent amount of quota in order to market the milk, or they have to accept a much lower price for over-quota production. Farmers realize they will overproduce their allocation towards the end of the dairy year and, of course, quota prices increase at that time due to increased demand. Since over-quota production levies are high, it may be a rational economic decision to cut variable costs for the remainder of the dairy year and reduce production to comply with the current quota level. The incentive for increased efficiency is therefore reduced.

Figure 1. Number of Dairy Farms per Province

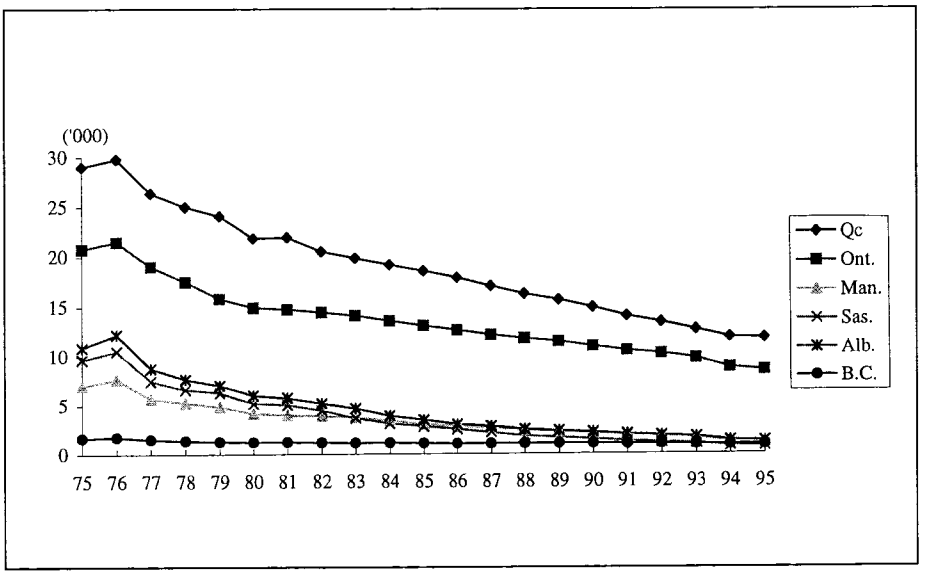


Figure 2. Average Herd Size per Province (Cows/Farm)

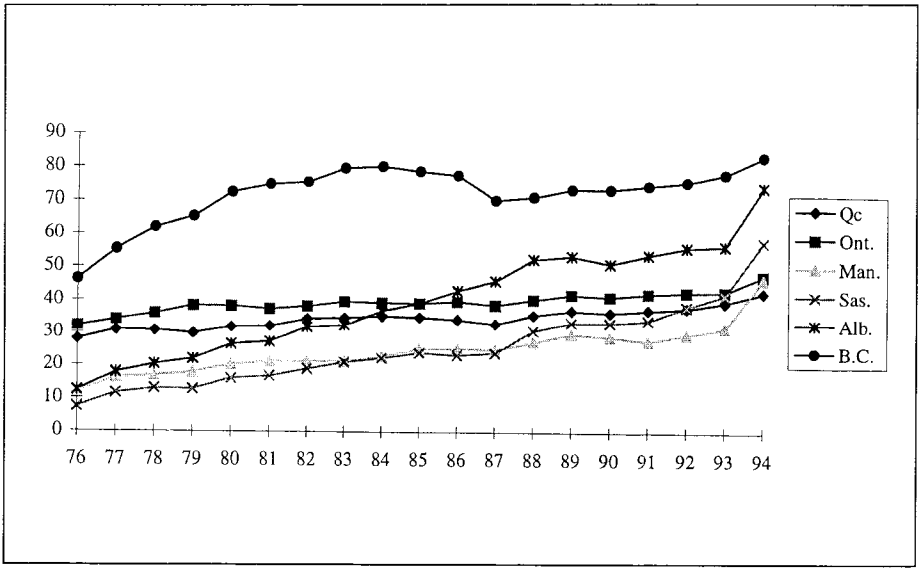
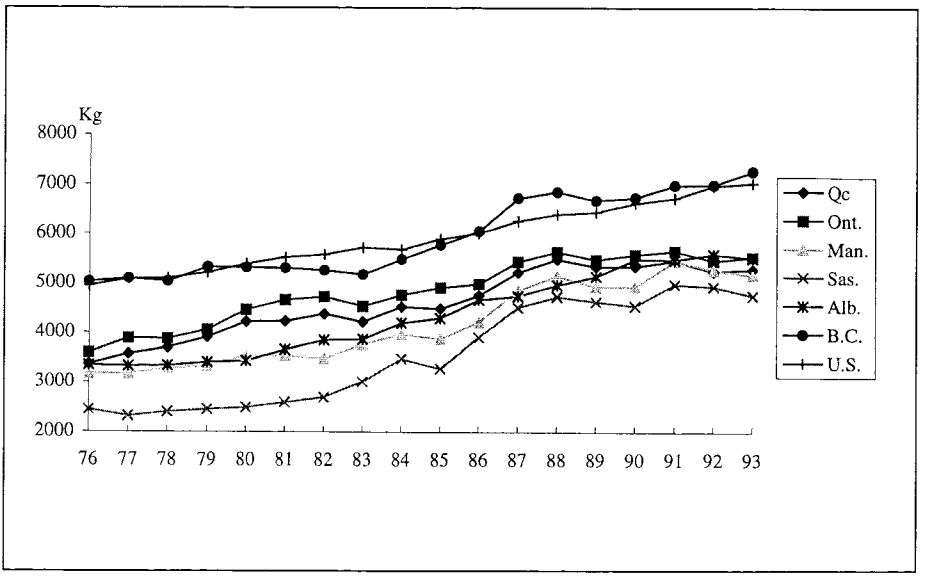


Figure 3. Average Yield per Cow, Canadian Provinces Vs United States



Another structural characteristic of the sector is the stability over time of the provincial allocations of the national MSQ. Provincial allocations of the national MSQ are mainly based on historical market shares. Pressures have been growing over the last several years to implement a national quota exchange market. However, since quota regulations and the milk pricing structures are specific to each province, and because they vary significantly across provinces, an agreement on implementing a national quota exchange market was never reached. Harmonization of provincial disparities were first required to insure a level playing field for all producers across provinces.

Moreover, the relative share of fluid milk quota to industrial milk quota varies across provinces. Therefore, producers located in a province with a relatively high ratio of fluid to industrial milk quota would have had a relative advantage to bid in a national quota exchange market. Indeed, their average revenues would have been higher: fluid milk price is higher than industrial milk price and producers usually own both types of production quota.

The agreement on pooling revenues from all milk that was reached by provinces in order to keep supply management operational within the country, and equitable across producers while complying with the rules under URA, created the opportunity to implement a national quota exchange market. Even though the harmonization process is not complete yet, this market should be operational soon. Once the harmonization process is complete, revenues on a per hectoliter basis will be similar across provinces, and the competitive and comparative advantages of each region for milk production will be reflected in the price producers are willing to pay for quota. The initial provision of the agreement on a common quota market is that a province can withdraw from the exchange market when its net loss to other provinces reaches 1 percent of its provincial share of milk production, including both fluid and industrial milk.

The expected implications on the structure of the dairy sector of the previously mentioned modifications to the national policy over the next five years are small. However, the direction is clear: less efficient producers will have greater encouragement to sell quota, leading to more consolidation of farms at lower production costs. Due to pressures to comply with the URA, all provinces will likely reach an agreement to pool milk revenues from all milk[7] and a truly national quota exchange market will become operational. The interprovincial movement of quota is difficult to predict and this is why the agreement among the provinces includes the possibility for a province to withdraw from the common exchange market when it has lost 1 percent of its provincial share.

Very few studies have investigated the potential impact on production allocation within the country of removing interprovincial barriers. Ewasechko and Horbulyk (1995) analyzed the interprovincial reallocation of MSQ for industrial milk using a linear programming model where the objective function minimizes the cost of producing and transporting milk in Canada. Their results suggest that there would be significant

[7]See footnote 5.

modification to the present allocation, and all provinces west of Quebec would increase their production level; Quebec and the Atlantic provinces would be net losers. However, the authors mention several limitations to their analysis, including the lack of standardized production cost data as well as the fact that they have not accounted for the costs of processing and manufacturing dairy products. Another limitation to their study is that they have not accounted for the relative levels of economic efficiencies across provinces and they have not included quota prices in their analysis. This seriously limits the benefits of their results in policy analysis.

Another study by Lambert *et al* suggests that the implementation of a quota market between Ontario and Quebec would shift milk production from Ontario to Quebec. This result is contrary to that of Ewasechko and Horbulyk. However, Lambert et *al*'s approach accounts, indirectly, for the relative levels of economic efficiencies between the two provinces by reflecting the willingness to pay for quota. Their model is based on estimated demand for and supply of quota equations for both used and unused quota markets, and the equations include several variables to account for different administrative policies between the provinces. Results show that as much as 5 percent of Ontario's industrial milk quota would be purchased by Quebec producers within one year. Results also suggest that the price of other agricultural commodities would significantly affect interprovincial quota transfers. However, the time frame of their analysis did not reflect similar milk pricing structures nor similar quota regulations across provinces, and this would likely affect quota movements.

Lambert *et al* did not analyze the implementation of a national quota exchange market, but the data presented in Tables 1 to 3 suggest that a likely result of such a modeling exercise would be the concentration of industrial milk production in Quebec, Ontario and British Columbia. Indeed, quota prices in the other provinces are lower and the quantities transacted are relatively small. Using a similar econometric modeling approach, one would have to invoke the Lucas critique (1976),[8] and expect significant changes in the would be estimated parameters, in order to argue that milk would continue to be produced in all provinces. For this reason, it is likely that there will be pressures from producers in provinces with comparative advantages in dairy production to increase the 1 percent limit on interprovincial transfers, and this would contribute to increase the economic efficiency of the supply management system.

[8]Lucas argued that people adapt their expectations, and therefore their behaviour, to the new environment when a significant policy change occurs, and estimated parameters using conventional econometric techniques are no longer reliable.

Table 1. Prices and Quantities Traded of Unused Quota of Industrial Milk per Region*

Year	PEI		NS		NB		Quebec		Ontario		Man.	Sask.		Alberta		BC
	P	Q	P	Q	P	Q	P	Q	P	Q	P	P	Q	P	Q	P
85-86	10.18	50.18			14.85		25.11	1188	25.26	1034				7.94	194	
86-87	10.94	27.19			18.38		25.79	1576	20.47	997				13.04	68	
87-88	10.82	50.30			14.51		26.21	1316	21.39	1013				19.37	147	
88-89	7.88	42.70			15.88		25.75	1548	21.94	1235				14.95	195	
89-90	8.19	38.57			18.87		24.55	1877	15.45	1457	16.40			12.41	223	
90-91	12.16	22.99			24.99		29.46	1598	21.36	1055	17.28			19.31	157	18.07
91-92	13.75	30.30			31.16		36.29	1046	28.71	834	18.71			20.94	111	20.82
92-93	20.50	11.87	35.18	52	33.54		37.17	1251	35.07	909	20.76			29.30	87	24.25
93-94	23.25	113.34	37.61	32	27.03	0.83	36.49	803	31.81	1581	21.12			23.86	117	29.33
94-95	24.24	89.11	37.88	128	27.48	1.02	40.04	950	37.44	1299	23.57	17.16	39.6	28.92	80	3350

* Data on quantities traded were not always readily available.

P = weighted price in $/kg of b.f. Q = quantities traded in thousand kg of b.f./year

NS: single quota in kg of b.f./day starting Oct. 94. (Used and Unused markets). Expressed here in kg of b.f./year.

Manitoba: single quota including fluid and industrial milk in kg of b.f./day. (Unused market only). Data on quantities traded were not readily available.

Saskatchewan: single quota including fluid and industrial milk in litres/day. Expressed here in kg of b.f/year. (Unused market only)

Alberta: 1994-95 is incomplete. Until March only.

NB: Quota in $/litres/day until Nov. 1990. Expressed here in $/kg of b.f. Since Aug. 1993, single quota including fluid and industrial milk in kg of b.f./day. Expressed here in $/kg of b.f./year. Data on quantities traded were not readily available prior to 1992.

BC: Prior to 1990, only fluid quotas were transacted and they included industrial milk allocation.

PEI: There is no fluid milk quota exchange and farmers receive their fluid milk quota according to their industrial quota basis.

Table 2. Prices and Quantities Traded of Used Quota of Industrial Milk per Region

Year	PEI`		NS		NB	Quebec		Ontario		Alberta		BC
	P	Q	P	Q	P	P	Q	P	Q	P	Q	P
85-86	7.85	28.05			9.31	18.43	743.87	18.11	458.93	5.99	2795	
86-87	10.81	37.26			12.84	19.79	523.17	15.47	327.44	9.20	9.06	
87-88	10.58	44.20			12.70	20.48	560.29	16.32	367.54	13.45	31.61	
88-89	7.87	35.80			12.49	19.23	780.87	13.96	580.65	9.05	60.81	
89-90	8.03	18.89			12.29	18.45	699.60	11.81	560.60	9.13	48.32	
90-91	13.13	33.88			17.28	23.20	724.42	15.31	530.89	10.76	37.50	10.90
91-92	13.75	50.58			19.41	26.04	1255.22	20.15	791.14	9.36	17.70	12.75
92-93	19.70	10.04	27.55	28.72	25.14	31.00	653.12	26.18	665.55	19.23	27.33	15.31
93-94	18.06	72.82	31.66	31.20		30.25	388.49	26.36	619.09	19.80	61.29	23.00
94-95	21.46	44.83				33.81	379.58	28.79	985.74	20.11	39.64	24.00

See Notes of Table 1.

Table 3. Prices and Quantities Traded of Fluid Milk per Region

	NB	Quebec		Ontario		Alberta		BC
	P	P	Q	P	Q	P	Q	P
85-86	210.58	363.06	61219	281,92	89478			573,62
86-87	267.88	376.32	41439	275,68	76353			631,79
87-88	267.18	373.17	45511	263,42	81053			598,82
88-89	243.17	347.65	57023	266,59	110249			563,69
89-90	257.42	350.53	60636	241,85	119855			501,48
90-91	314.18	380.39	58122	286,44	104961	266,50	1545	409,66
91-92	303.17	35.27	519523	347,52	126709	281,72	8260	418,47
92-93	264.91	36.21	314160	370,78	98179	322,40	6905	483,25
93-94						299,53	10270	553,36
94-95						297,24	9295	598,14

P = weighted price in $/litres/day. Q = quantities traded in litres/day

See Table 1 for other notes.

The most important policy modification with respect to a potential increase in efficiency of the dairy sector is the implementation of the optional export program (OEP). Producers have always resisted the implementation of voluntary export programs for several reasons. An obvious reason is that producing milk at a lower price for foreign customers would not be seen favourably by Canadian consumers. Another important reason is that producers wanted to ensure compliance with the GATT Agreement and not put themselves in a position where they could be accused of dumping dairy products on the world market.

The impact of the OEP will depend upon the way it is administered by Provincial Boards in each province. Not all provinces have yet determined their administrative policies. Producers in Ontario have decided that the decision to participate or not in this program has to be taken collectively. Therefore, if processors find a market for a particular product and if the Ontario Milk Marketing Board accepts that they will supply milk to this market, it is a collective agreement and all producers are responsible to supply the agreed amount of milk. Operating the OEP in this manner has the advantage of sharing the risk and the marginal revenues among all producers but this will not fully use the potential benefit of the program for increased efficiency of the sector. Indeed, increased efficiency could be reached by allowing producers who can produce at lower costs to do so if market opportunities can be found, even if product prices may not be sufficient to satisfy high cost producers. Moreover, the potential for this policy to identify comparative and competitive advantages of both the production and the processing sector will be deferred.

There is a significant potential increase in Canadian production due to increased economic efficiency (Weersink et al, 1990, Romain and Lambert, 1995). Therefore, administrative policies which would allow different producers to supply milk for export at different prices could contribute to decrease pressure on quota prices as well as allow producers to increase their size of operation at a lower cost, and hence increase their competitive position. This, however, may diminish the overall power of the provincial milk marketing Boards due to a possible hole in the supply management system : producers will have more latitude in their production decision. Nevertheless, if the other provinces follow the lead of Ontario in their administrative policies of the OEP, the impact of this modification to the Canadian dairy policy on the structure and efficiency of the sector will be positive and small.

Another factor that will affect the performance of the OEP is the evolution of the target price for milk, which is set by the CDC twice a year (August 1st and February 1st). The Minister of Agriculture has announced a cut in dairy subsidy but producers want this cut to be picked up by consumers. Producers' argue that the target price is already well below their calculated cost of production and they cannot accept a lower price for milk. The previous cut in 1993 did not result in lower producers prices nor did the cut in 1995. Increases in the domestic demand, perhaps due to increased advertising of dairy products,

increased consumption of industrial milk (dairy products) steadily since 1992[9]. However, the latest cuts in subsidy, which will account for increased milk price to processors of about a 3 to 4 percent in 1996, may have an effect on domestic demand for dairy products. If there is a decrease in domestic consumption, producers will face cuts in MSQ and this may put pressures to develop the OEP. Pressures will come from producers themselves because they will not want to invest large amounts of capital in quota purchases only to keep the same level of production, as they had to do in the 1988 - 1992 period when national MSQ was reduced by 13 percent.

On the other hand, if the pressure to decrease the quantity demanded of dairy products due to higher milk prices is counter-balanced by an outward shift in the demand function, so the national MSQ is not decreased, the impact of the OEP may be small, and the participation in the OEP could remain marginal. It is unlikely that the CDC will increase its support price enough to compensate both the reduction in federal subsidy and the increase in the cost of production. However, producers in Quebec in particular, argue that if they are not assured of a target price that will follow the evolution of their cost of production, they will not participate in the OEP. This position may change depending upon the response in the other provinces, but the impact on the structure and performance of the dairy sector will remain marginal.

Effects on the Structure and Efficiency of the Processing Sector. A possible rationalization at the production level has direct implications at the processors level. If milk production can move from one province to another, processors in the selling province would become less competitive due to a shortage of milk. Processors therefore argued for a level playing field and requested that raw milk could also move from one province to another. The modification of the surplus removal program with the implementation of Plan C will allow interprovincial movements of raw milk before surplus milk is processed into butter and skim milk powder. This should compensate partly the potential loss in competitiveness of processors located in a production shrinking province, as well as maximize producers revenues from the domestic market. This plan is presently suspended because it could have created perverse effects in its original form. Discussions are presently underway to insure an acceptable working form of the Plan and it should be operational shortly.

With freer movement of milk across provinces due to the implementation of Plan C, more aggressive market development behaviour will develop. Small butter plants will likely have more difficulties to operate continuously as they will have to make milk available to other processors before manufacturing butter for which they do not have markets. Larger and more diversified processors with more elaborate marketing strategies will have an advantage to expand operation and enjoy economies of size.

The evolution of the industry over the last twenty years suggests that processors in Quebec have a competitive advantage over processors in Ontario, while processors in the rest

[9]Note, however, that 1992 was the end of a four year period of significant cuts in the national MSQ.

of Canada are in the worst position. Figure 4 shows that the share of butter production has been gradually increasing in the rest of Canada while it has decreased in Quebec and remained at the same level in Ontario. This reflects the fact that processors in Quebec have gradually increased their share of higher value-added dairy products. They have developed an expertise in manufacturing and marketing high value added dairy products which will benefit them in a more competitive environment.

Better performance by processors in Quebec over that of processors in Ontario, and especially over that of processors in the rest of the country is also evident when one analyses labour productivity in manufacturing plants. Figure 5 shows that the value added per person employed is higher in Quebec than in other provinces. Moreover, the annual increase in the value added by employed worker over the 1976-92 period has been $2,680 in Quebec, $1,390 in Ontario and only $580 in the rest of Canada (Romain and Lambert, 1994). These results suggest that the processing sector in Central Canada is better equipped to face further domestic competition.

The implementation of a national quota exchange market and the provision under Plan C for milk to move across provinces should therefore give an indication of where the comparative advantage of the dairy industry lies within Canada. However, an important factor which will contribute to the competitiveness of a province is the degree and the quality of the interaction between producers and processors. The recent policy changes favour the concentration of decision making in the hands of producers as compared to the other stakeholders in the dairy sector, and it transfers provincial autonomy in decision-making to the national level. Processors, in Quebec in particular, feel they are being left out by the National Policy reform while they believe they could contribute in a more active way to increasing the competitiveness of the sector. Some processors argue that the system will become more rigid because the major decisions will have to be agreed upon at the national level where there are nine possibly divergent positions. The superstructure created to administer the National Policy may constrain the decision making process and defer decisions that used to be taken more rapidly at the provincial level. This is one of the reasons why no major changes in the structure and efficiency of the dairy sector are expected over the next five years.

Summary. In summary, the impacts of the recent modifications to the National Dairy Policy are not expected to be major on the structure and efficiency of the dairy sector over the next five years if the NAFTA Panel rules in favour of the Canadian position. The extent of the impacts are closely linked to the final agreements that will be reached on the actual working terms of Plan C, on the performance of the national quota exchange market, as well as on the provincial administrative policies of the OEP. However, the modifications to the National Dairy Policy, which follow from hard and difficult discussions across provinces, may be very useful to face alternative decisions of the NAFTA Panel as it is discussed in the following scenarios.

Figure 4. Index of Provincial Shares in Butter Production

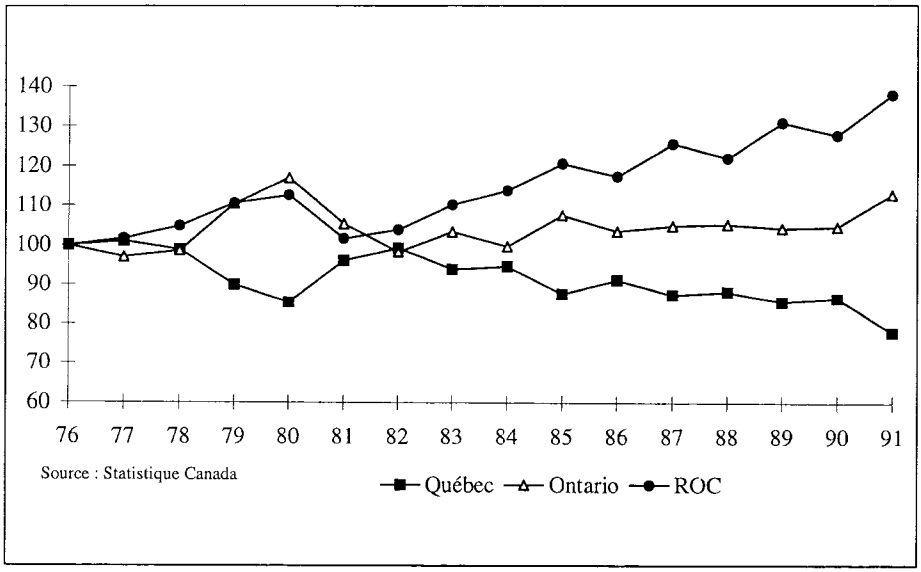
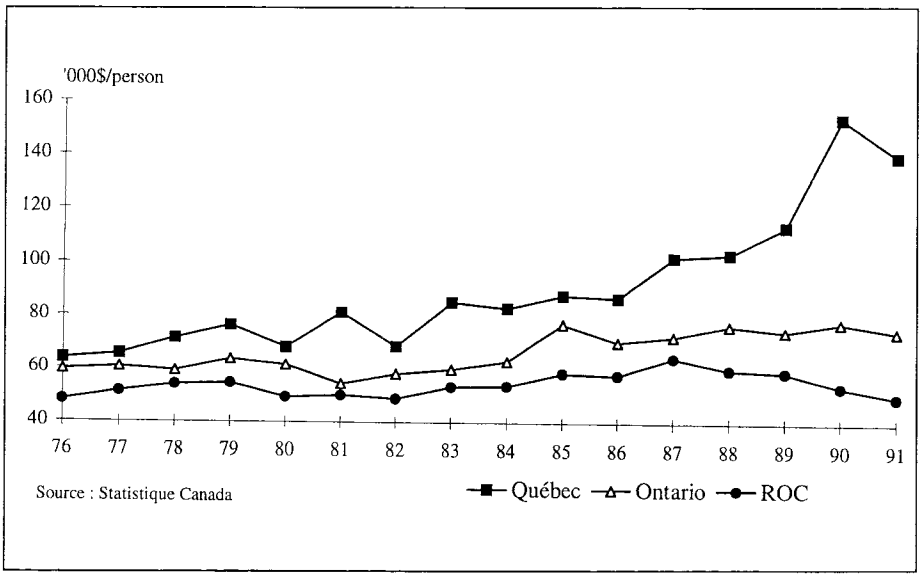


Figure 5. Value-Added per Person Employed in the Manufacturing Dairy Sector



Scenario Two: A Panel's Decision in Favour of the United States' Position

This discussion considers the alternative situation, where the United States position that NAFTA dominates is upheld. We will do this through a series of changes, which can be interpreted as decomposing a decision favouring the United States into steps or as possible intermediate decisions made by the Panel, however likely or unlikely such decisions may be. We also focus on the plausible empirical magnitudes that are involved, which are interesting in their own right but also provide some justification for the assumptions used in the Meilke et al paper. The numbers that are used should be interpreted as indicative, not precise.

We consider three steps in this "scenario two": (a) tariff removal on ice cream and yogurt only, (b) tariffs off all industrial milk products, and (c) the removal of fluid milk tariffs. Our two foci are on (1) determining the intermediate effects of these policy alternatives, say within 5 years, and (2) looking at the effects of these changes on the domestic industry. The broader range of consumption and trade effects, and related issues are left to other papers in this publication. To understand the magnitudes involved, Table 4 gives the tariff levels in effect beginning July 1, 1995 after the tariffication process of the Uruguay Round Agreement of 1994, the final URA tariff (15 percent total decline), and the annual decline in tariffs in percentage points under NAFTA where tariffs would become zero percent in the time period negotiated (assumed to be 10 years for illustration).

Table 4: Initial and Final Tariff Levels under the URA and Possible NAFTA Tariff Declines

Product	URA 1995 Tariff (%)	URA Final Tariff in 2001 (%)	NAFTA Annual Tariff Decline over 10 yrs to 0%
Butter	351.4	298.7	35 percentage points
Cheese	289	245.7	29
Ice Cream	326	277.1	33
Milk	283.8	241.2	28
Yogurt	279.5	237.6	28

Source: Uruguay Round Agreement documentation

Ice Cream and Yogurt. First we will analyze the case of two industrial milk products, ice cream and yogurt. Although accounting for only 11 percent of the value of industrial milk products, they have been given relatively more trade policy attention among dairy products because, they were the subject of an earlier (1988-89) GATT investigation into the legality of import quotas imposed on those products by Canada in 1988 after the Canada-U.S. Free Trade Agreement was signed. That investigation, brought forward by the United States, concluded that these import quotas were not legal under the GATT. Singling out these two

items in the current panel decision is unlikely, given that the previous problem was caused by the imposition of import quotas that now have been removed. However, it still may be useful to consider their importance in comparison to a larger decision that applies to all industrial milk products.

A decision in favour of the United States, focused on ice cream and yogurt, would be to lower the current Canadian tariffs on U.S. imports of 326 percent and 279.5 percent, respectively, to zero over a time period to be negotiated. This would mean that, after that time period, ice cream and yogurt prices in Canada will mirror those in the United States, differing only by transport and brokering costs. Immediately following that period, Canada would plausibly be on an import basis in those products if no action is taken, so that wholesale prices in Canada would be c.i.f. prices, equal to U.S. wholesale prices plus transport and related importing costs (and a zero tariff).

This situation could be met by a variety of policy responses within Canada. Basically, Canada would have two options—to reduce its industrial milk quota level, or to lower the average farm price for industrial milk in Canada (or some combination of the two).

In the first option, Canada would abandon the ice cream and yogurt markets to the lower-priced U.S. imports. This would mean a reduction in the national industrial milk quota (MSQ) equivalent to the milk supplies previously required to produce the ice cream and yogurt. These two products account for 11 percent of industrial milk sales. In volume terms, the decline would be a lesser proportion, because unit values of ice cream and yogurt are higher than other industrial milk products.[10] With a decline in MSQ levels, there would be no need to reduce farm gate industrial milk prices in Canada from their current levels. This option is, however, unlikely.

In the second case, these two products could be priced lower at the point of trade (wholesale level) to meet the U.S. import competition. However, Canadian processors could not continue paying higher prices for their raw milk than their U.S. counterparts, and be competitive with the lower prices of the imported product. Therefore, this case would further require lowering Canadian farm gate prices on raw milk to U.S. levels, assuming that Canadian ice cream and yogurt makers are as efficient as their U.S. counterparts.[11] However, with border protection being lowered only for ice cream and yogurt in this scenario, farm milk prices would need to be lowered only enough to cover the equivalent of

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[10]Recent estimates for Ontario and Quebec are that yogurt and ice cream account for 10 percent and 5 percent of their respective allocations of industrial milk (ISTC, 1991). The shares in the other provinces are likely within this range.

[11]This assumption is supported by detailed engineering cost studies for plants built in Canada and the United States for long run marginal costs (ISTC, 1991) and is discussed below. If Canadian plants are higher cost operations than their U.S. counterparts during the intermediate run before adjustments to tariff declines are completed, farm milk prices in Canada would have to be lower than those in the United States in order for the Canadian industry to be competitive, and conversely if Canadian plants are lower cost.

the milk supply going into ice cream and yogurt, roughly one-tenth of the industrial milk supply. The recent modifications to the national dairy policy could accommodate this option. Milk used in the production of ice cream and yogurt would be sold as "special milk class 5". In fact, this is presently done for some products that use dairy constituents and that are traded between Canada and the United States.

We can give some rough magnitudes to the numbers that are involved under these options. In the first case, the Canadian industrial milk quota will fall by the amount of milk previously needed to produce the ice cream and yogurt, say 10 percent of industrial milk sales. With industrial milk production of 42.5 million hl (1994) priced at current average levels of $47.41/hl, this would represent a loss in terms of gross revenues to the industry of some $200 million. In fact, the loss is likely to be somewhat higher because milk used for ice cream and yogurt is priced higher than that used in other dairy products. Although the loss in net returns to producers would be considerably less than the loss in gross returns (say no more than 1/3), this option is unrealistic in that it assumes no response by the Canadian industry.

The second option, reducing milk prices, is more attractive. At the present time (using 1994 data) U.S. farm gate milk prices are equivalent to CDN$41/hectolitre landed in Canada, assuming a one dollar per hectolitre (hl) cost of transportation. This can be compared to a 1994 net farm gate milk price of $48.65 in Canada (market returns plus subsidy). Therefore, the effect of lowering milk prices to the U.S. level would be a fall in Canadian prices of $7.65/hl (16 percent decline). When that is multiplied by the share of total industrial milk production that goes into ice cream and yogurt (10 percent), the loss in total gross returns (net of levies) on industrial milk would be (0.16)(0.10) or 1.6 percent. In dollar terms, this loss would then be equivalent to about $30 million.[12]

What can we conclude about the loss of tariff protection on ice cream and yogurt? First, if this situation were to arise, a price response to the loss of tariffs on ice cream and yogurt is considerably more attractive than simply walking away from that market and letting it be served by imports, assuming a very elastic (excess) supply of U.S. product. Second, the possible loss to Canada from lowering farm milk prices to U.S. levels for only the ice cream

[12]The above discussion on this second case is still pessimistic because it also assumes a minimal reaction (only a matching price) from Canadian processors. In such a case, losses to the farm sector would be less than 2 percent. However, recent discussions with processors show that several large processors would welcome such an opportunity to have access to the U.S. market. They strongly believe that the quality of their products compares favourably to that of U.S. products. Also, their experiences in visiting plants in the United States convinced them that they would be competitive with their U.S. counterparts if they could have access to the raw product at comparable prices. Considering the excess capacity of the production sector mentioned previously, the net effect on producers' gross revenues is unclear. The impact of this Panel outcome on the structure of the sector would, however, be negligible due to the small percentage of total production that is at stake.

and yogurt classes is relatively small (less than two percent)[13]. The small size of this effect is mainly the result of the small share of the industrial milk market accounted for by these two products. It also reflects the relative similarity of farm milk prices in the two countries. Looking only at possible losses to ice cream and yogurt imports, however, may be excessively pessimistic. As noted in footnote 12, Canadian processors may be quite competitive in their costs and product quality and may be able to export to the United States once U.S. border protection is reduced.

Industrial Milk. In 1994, the industrial milk sector accounted for 42.5 million hectolitres, roughly 60 percent of the quantity of all milk produced in Canada. The net average price (net of levies and charges) received by farmers for industrial milk (94/95 dairy year) was $48.57/hl, the sum of the net market return ($43.14/hl) and the direct subsidy ($5.43/hl). Therefore, this sector accounted for market revenues to farmers net of levies of about $1.83 billion, and was supplemented by the total direct subsidy payment of $223 million. In terms of market revenues at the farm gate, the industrial milk sector accounted for 53 percent of total farm dairy revenues in 1992 (the remainder being accounted for by fluid milk sales).

A Panel decision favouring the United States would lower the milk product tariffs listed in Table 4 to zero over a negotiated time period. This would have a significant effect on the Canadian industrial milk market by changing the process of price determination in Canada as well as lowering the price level. However, these lower price effects are not likely to be imminent. Current tariffs are so high that they prohibit imports like the previous import quotas, and Canada remains insulated from price effects in other markets. Further, this situation will not change over the course of the URA because even after the 15 percent URA tariff reductions, tariff levels will still be prohibitive. However, even with the NAFTA-imposed tariff declines of this scenario 2, the current tariffs are sufficiently high that without major exchange rate changes, imports would likely become seriously competitive with domestic industrial milk production only in the last year of the phase-in period of tariff cuts. This means that Canada would have an adjustment period where tariffs will be falling, yet the industrial milk sector could function much like it does today, with few direct signs of import competition until the last year of the adjustment period. At that point there would be a major drop in price to U.S. landed import price levels, assuming a perfectly elastic U.S. export supply curve.

However, this situation alone is unlikely to prevail politically if the United States "wins" the Panel decision. Rather than wait five, ten, or more years for any benefit from a Panel decision, the U.S. is likely to insist upon interim compensation. The most likely form of compensation would be an increase in the tariff rate quota (TRQ) allocated to the United States. This could take the form of some immediate "down-payment" TRQ increase, some incremental increase over the tariff phase-out period, or some combination of the two. This would give the United States an immediate benefit in terms of sales to Canada, possibly an

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[13]There is a regional effect here too, given that ice cream and yogurt are produced mostly in four to five provinces, but the effect on average or blended farm level milk prices is still relatively small.

unsustainable increase after full trade liberalization, as is suggested below. Its effect within Canada would be to reduce aggregate MSQ by the amount of the TRQ increase to the United States in each year.

To examine the possible changes to Canadian producers in more detail, we start with the U.S. farm gate milk price, particularly its value landed in Canada. Using the 1994 U.S. manufacturing milk price, the then-prevailing exchange rate (much the same as today's exchange rate), and an assumed cost of transportation (US$1.00/cwt), the landed cost of U.S. milk in Canada would be $41/hl (Meilke et al, 1996). This should be compared to the 1994 cost of raw milk to Canadian processors of $47, the difference being $6/hl or almost 12 percent. The point to note is that with current milk prices and exchange rates, and using aggregate date, the U.S. landed import value is within 12 percent of the current processor cost of raw milk in Canada.

If we were to fine tune these numbers, the changes would tend to widen the Canada-U.S. price difference by several dollars. First, the cost of raw milk to Canadian milk processors is based upon target return, obtained by selling the milk as butter and skim milk powder. In fact, a majority of Canadian industrial milk is sold into higher valued uses such as cheese, ice cream, and yogurt. The average price paid would then be somewhat above the $47 level. Similarly, it is possible that U.S. milk exported to Canada could be procured at prices lower than the average U.S. manufacturing milk price. Together, these two factors could increase the Canada-U.S. price difference to as much as $8 - $9 per hectolitre, or about 17-19 percent. This could be particularly important in some regions.

Leaving aside for the moment the possible increases in TRQ to the United States, this illustrates why the Canadian industrial milk sector would still be well-protected right to the last year of a phase-in of tariff cuts under a Panel decision favouring the dominance of NAFTA rules. The lowest tariff level in the last year of a ten year (linear) phase-in is 28 percent, and that would still leave the average U.S. product uncompetitive against Canadian products made with current Canadian raw milk prices.[14] This would still be true for a 15 year phase-in (where the last year's tariff then would be at least 19 percent) and possibly for a 20 year phase-in (the last year's tariff would be at least 14 percent).[15]

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[14]U.S. products could be competitive in that last year if Canadian processors were much less efficient that their U.S. counterparts, but, from evidence discussed later, this appears not to be the case.

[15]It should also be noted that when the protective tariff is imposed on an intermediate or finished product like any of the manufactured milk products, the effective protection on the raw material is greater than what appears to be the case from the nominal or apparent tariff. If the raw milk accounts for half the costs of making the more processed product, its *effective* protection could be as high as twice the apparent tariff as would be the case if the other costs of processing (other raw material costs, labour costs, capital and machinery costs, etc.) are comparable to those of the U.S. competitor.

What this reveals is that under current conditions, especially the exchange rate,[16] the difference in raw milk costs between Canadian and U.S. farm sources facing a Canadian processor may not be exceedingly large—farm gate milk prices calculated on an import (c.i.f.) basis in Canada are between 10 and 19 percent under current policies and circumstances. Where within this range the difference lies depends upon assumed transport costs, whether procurement costs in the United States are at or below the average price of manufacturing milk, and whether Canadian milk supplies are prices at or above the target price. Secondly, the combination of similar raw milk costs, high current tariffs and phase-in periods of 10 years will leave Canadian raw milk prices largely unaffected for almost all of the phase-in period. However difficult the adjustment to lower milk prices and MSQ levels, Canadian dairy farmers will have most of the full phase-out period before any serious price changes from the NAFTA Panel decision will be seen.

Farm Prices. The next question concerns the implications of these changes at the farm level. First, what will happen to farm gate returns and second, what will this mean for milk supplies within Canada? On the first, the 1994/95 net farm return for industrial milk (using Ontario data), from market returns and the direct subsidy, net of levies and fees, was $48.57/hl, made up of the market return component of $43.14/hl and the direct subsidy, $5.43/hl As these numbers are based on target returns, actual farm market returns may be slightly higher.

Zero tariffs on manufactured milk products will place strong pressures on milk processors to cut costs to be competitive with imports that are made with cheaper milk raw materials. This can be avoided only if, in other areas of the milk processing activity, Canadian milk processors have a strong cost advantage. Our reading of the available evidence (mostly from studies in 1991, reported by Agriculture and Agri-Food Canada, 1995, and discussed in more detail later in this paper) suggests overall similarity in non-raw milk processing costs, although this would be exchange rate sensitive. The current exchange rate may give Canadian processors some advantage, but we lack enough information on current comparative costs to quantify it. Therefore, we will make the possibly conservative assumption that processor costs are now similar in the two countries, resulting in strong pressures to lower raw milk prices in Canada to U.S. levels to make manufactured milk products competitive.

Using 1994 data (above), market returns paid to farmers by processors dropping to U.S. levels would mean a decline from CDN$46.85/hl to levels in the vicinity of $41, a drop of almost $6/hl at the prevailing (and current) exchange rate. However, part of this price

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[16]The importance of the exchange rates in competitiveness calculations is illustrated by the rate changes within only the last five years. In 1990 the average exchange rate was 1.15 (Canadian dollars per U.S. dollar) and in 1994 the value was 1.39, a decline in value of the Canadian dollar of 21 percent. Farms or processors that were uncompetitive with imports in 1991 could be exporting profitably by 1994. For a longer term perspective on these price comparisons, it may be preferable to use an average value of the Canadian dollar over a number of years, probably near US$0.80. If such a value were used for current price comparisons, the landed price of U.S. milk in Canada would fall from CDN$41.02 at the 1994 actual exchange rate, to CDN$36.89.

drop should be offset by a reduction in levies. With an open market there will be no need to finance export losses or special domestic programs. Consequently, producer returns will increase by the removal of the within-quota levy ($2.18/hl) and possibly other charges (e.g., domestic butter program costs, some marketing board fees).[17] Considering only the in-quota levy, the result will be a *net* price drop to producers from the tariff removals and levy removal of $3.65. Ignoring the direct subsidy, farmers' net *market* returns can then be expected to decline from $43.14/hl (1994/95) to $39.49/hl after the tariff removal is complete, a *reduction of 8 percent.* In addition, there is the likely drop in production (MSQ) levels that will be needed when U.S. TRQ levels are increased.

The final variable affecting net producer returns is the direct subsidy. It is primarily a domestic policy variable and is not centrally affected by the change in tariffs, but it could be increased to offset a tariff-induced fall in market prices in order to maintain domestic production. In fact, it has been cut in recent years as a budgetary measure and is slated to decline to zero over the next five years. This could be a second source of decline in producer net returns (after possible tariff cuts) unless support prices are raised to compensate for reductions in the subsidy.[18] By 1996/97 the subsidy will have fallen to $3.80/hl (from $5.43 in 1994/95) and will be phased out entirely by the year 2 001 as planned with ongoing budget cutbacks. To look only at the trade policy issues, we treat the direct subsidy as continuing at $3.80/hl and add it to the new (post-tariff removal) market returns of $39.49, leaving producer net returns from all sources at $43.29 after tariff removal is complete.

Implications for farm milk supplies in Canada. With the industrial milk sector facing the prospect of a decline in milk prices under this scenario due to the removal of milk product tariffs, albeit some years into the future, what will be the likely supply response? Will the industry be competitive enough to maintain its domestic market? A quick response might be that domestic production would decline in the face of price falls on the order of 10 percent, and lose some or most of its domestic market. Such a response may be based on the assumption that since prices would be equalized to costs, and given higher milk prices in Canada, costs of the Canadian firms in this market also would be higher. Therefore, with a decline in tariffs, domestic production and market share would also decline.

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[17] As mentioned previously, since August 1995 the within-quota levy is no longer in effect, but the new pricing policy is equivalent, for producers, to having the former within-quota levy imposed.

[18] In fact, this did occur for the 1993 reduction in the direct subsidy when it fell from $6.03/hl to $5.43/hl and it may have occurred in August 1995. If so, net farm returns per hectolitre will be unaffected as long as tariff protection is prohibitive. Once tariffs have fallen to zero, then market returns for milk products will be determined by U.S. milk prices and there will be no opportunity to raise these prices to compensate for any direct subsidy reductions. In any case, passing declines in the subsidy onto consumers through increased support prices is not costless. It will lead to reductions in consumption and resulting declines in MSQ.

Such an analysis can be erroneous due to the presence of binding marketing quotas on industrial production. The critical question, given these quotas, is the level of milk supply prices within this quota-regulated market. Once one acknowledges that with binding quotas the supply price will be below the market price, then the supply response to a lowering of nominal prices, in conjunction with the removal of the quota restriction, could be positive or negative.

Farm Level Supply Price of Industrial Production. The question here is, what is the supply price of industrial production in Canada at the farm level. To be competitive in the final industrial milk products there is also the question of the competitiveness of processors, apart from their milk raw material costs. These questions are not easily answered for several reasons. First, on the farm side, the supply curve cannot be observed using traditional econometric methods when quotas are imposed because changes in prices will induce no changes in output. Second, with a small number of processors in some markets possessing market power, there is the usual difficulty in determining actual costs under such conditions. Third, for both farmers and processors, when there are relatively high returns and little competition, costs may not be kept as low as they would be under more competitive conditions. Alternatively, with added competition and narrower margins, productivity usually rises and costs or margins are pushed down. The question is what is the scope for cutting costs when faced with lower prices.

For farm costs, we have several observations. First, we know that with marginal prices between $48/hl and $49/hl and with relatively high values of traded industrial milk quota, farmers are competitive at prices below this level. Exactly how much below is not clear, but the very high MSQ prices in some markets suggests that marginal costs may be considerably below current milk prices. To make more definitive statements about cost levels on the basis of quota values requires detailed analysis on that topic specifically.

Second, Barichello and Stennes (1994) analyzed traditional farm cost data for three U.S. states and three Canadian provinces, using the same methodology and similar data sets, for 1989. The results show that average costs for the three Canadian provinces were in the range of $37/hl to $45/hl in 1989 prices. Translating these costs into 1994 dollars would require an adjustment for inflation and for increased productivity such as in milk yields per cow. Given low inflation levels over this period, this adjustment would likely be no more than a five percent increase. Taking the mean of the cost range as $41/hl (1989 dollars), a 5 percent increase would place average costs at $43/hl (1994 dollars).

However, a second observation from this study was that unit costs fell significantly when herd size increased from 40-50 cows into the range of 60-70 cows and above.[19] In the latter group, average costs averaged about $35/hl. If adjusted upward by 5 percent to put this in 1994 terms, average costs would be in the range of $37-38/hl. Since 1989 there has been

[19]This observation is also made by Desbiens and Negrave (1993) for Ontario and Quebec dairy farms, where the highest deciles of dairy farms have higher costs, particularly the 10th decile. Romain and Lambert (1995) also report similar conclusions.

considerable exit among dairy farms and this has been most pronounced among smaller farms. Therefore, a more recent review of farm cost data would likely reveal this changing industry structure by showing a larger average herd size and lower average costs.

Third, similar results for raw milk costs of production between the two countries have been reported by other authors for the same period (Jeffrey, 1992, Phillips, White and Stonehouse, 1989, and Price Waterhouse, 1991), where U.S. farm level costs are lower but within about 10 percent using exchange rates that value the Canadian dollar at high levels compared to current rates. It is also worth noting that U.S. studies of comparative milk costs between the two countries typically find U.S. farms at a large (25-30 percent) cost advantage (e.g., Baker, Hallberg, Tanjuakio, Elterich, Beck and Liebrand, 1990, and Nicholson and Knoblauch, 1993), a result that we suggest is considerably in error.

The conclusion that even taking average costs across all (1989) farms, a "high cost" scenario, and using them to indicate long run marginal costs, those costs in 1994 would be around $43/hl. When compared with a landed cost of U.S. milk of $41, the industry in Canada would be close to being competitive today. With such costs and no structural change occurring, Canada would likely lose marginally in terms of market share to U.S. product. However, an extension of recent trends, in terms of structural change to larger farms, would be likely to lower these costs more in Canada relative to those in the United States.

An alternative scenario would recognize more explicitly the current trend in structural change to larger farms that is now occurring in Canada and that will push average herd sizes above 50-60 cows. Judging by the data referred to above, such farms have 1989 average costs in the $35/hl range (slightly less in the United States). An adjustment to 1994 prices would still leave their costs below $40/hl. This would leave Canada very competitive at the farm level, given current landed U.S. prices around $40/hl. For those farms below such sizes, the phase-in period gives them valuable time to increase their size (and make other changes) to achieve the lower costs described. The longer term implication is that under this scenario, with net farm prices for industrial milk in the vicinity of $40/hl, farms with fewer than about 60 cows will be increasingly uneconomic for farmers with any reasonable alternative value for their labour.

Processing margins. On the processing side, there are three studies on comparative costs between the two countries for several milk products, and two of the three were done in 1991 (ISTC, 1991, Price Waterhouse, 1991, and McClain (referenced in 1992)). The latter two studies that examined existing plant costs showed that U.S. plants have lower margins (i.e., manufacturing costs only), but the United States advantage varies by product line. For example, the Price-Waterhouse study finds only a 2 percent advantage in fluid milk while it finds a 24 percent advantage for ice cream. The third study was interesting in that it looked at long run marginal costs for plants newly built in both countries at a size that was judged to be the minimum economic scale. These sizes were consistent with the production base and market size in Ontario and Quebec, but may not have been feasible or economically viable in some of the other provinces. It found that costs were virtually equal between Canada and the United States for cheese and yogurt, while there was a slight U.S. cost advantage for ice cream. The study concluded that in all three products the processing cost

differences were not significant and that such Canadian plants would be competitive with their U.S. counterparts if they could buy raw milk at comparable prices.

These studies suggest that existing plants may suffer from some cost disadvantages when we consider their current scale and the high value of the Canadian dollar that existed at the time. However, Canadian processors could build new, larger processing plants and operate them competitively, even at relatively high exchange rates. Using more current exchange rates would ensure this competitiveness. There are some indications that mergers are taking place among milk product processors across Canada which could be interpreted to support the study findings just noted. That is, such firms are positioning themselves with larger scale operations to be competitive with the United States when the border becomes more open. This says that once these adjustments in the processing sector take place, processing margins will be roughly the same as (or lower than) those in the United States. With similarly priced raw milk, as would be likely to occur when tariffs are removed, the Canadian milk product industry will be competitive with the United States.

Overall prospects for the industrial milk sector under U.S. free trade. We conclude the following from the above review of the evidence. First, the Canadian industrial milk industry is, or is in the process of, becoming competitive with the United States at both the farm and processing levels and at current exchange rates. On the farm side, price falls to about $40/hl coupled with a removal of quota costs and constraints, can be accommodated by the industry. However, farms at the bottom of the size distribution, those with fewer than 50-60 cows, will be pressured by the prospect of these lower prices to increase herd sizes to exploit size economies, or exit the industry. This process has been occurring for decades but will likely intensify in the next few years as lower trade barriers with the United States are experienced. The same general observations apply to the processing sub-sector as well. If there is a major change in exchange rates, such as a Canadian dollar climbing to U.S.$0.85-0.90, then greater adjustments will be needed to maintain competitiveness, mostly at the farm level. This structural change will increase the competitiveness of the Canadian industry, perhaps enough to be profitable at higher exchange rates. There is even the possibility of generating exports of some milk products to the United States.

Finally, there is no evidence to support the prediction of a collapse of the Canadian milk sector as was recently predicted within Canada (Informetrica, 1995) if tariffs on U.S. product imports are removed. There are likely to be challenging adjustments to larger sized operations at both farm and processing levels, but as just noted, this has been a continuous process for decades. Similarly, there is not likely to be any large industrial milk market available for the taking by U.S. dairy exports. The milk market is likely to be quite competitive between the two countries, as one would expect with largely the same inputs, technology and know-how being used, open borders for purchased inputs, and similar costs of capital and labour once the exchange rate is taken into account.

Fluid Milk. This final section involves the fluid milk sector, specifically a reduction in fluid milk tariffs (with the United States) to zero over some negotiated adjustment period. Tariff changes here are almost as important as those in the industrial milk sector as the fluid milk sector across Canada is slightly more than 2/3 the size (in output weight) of the industrial

sector. In some provinces (the Maritimes (aggregated), Ontario, and British Columbia) , the fluid sector is larger than the industrial sector. Fluid milk production in 1992 was 27.2 million hectolitres, or 39 percent of Canadian milk produced. As in the United States, fluid milk regulations and pricing is determined at a provincial (state) level, although there is presently little trade in fluid milk across provincial boundaries. Milk destined for fluid uses is priced at a premium above industrial milk levels in both countries, but that premium is larger in Canada than in most U.S. states. The situation in 1994, drawn from Meilke et al (1996), is that the landed price in Canada of U.S. fluid milk would be CDN$44.27/hl, while the net of levy producer return for fluid milk in Ontario was $56.20/hl. The difference between the two countries is $11.93/hl so Canadian prices would fall by 21 percent if they were lowered to U.S. levels.

The trade issues resulting from a negative Panel decision are similar to those noted above for ice cream and yogurt. First, the current tariff on fluid milk is 283.8 percent, and it would be lowered to zero over some negotiated time period such as 10 or more years. Using 1994 data, the result would be a fall in fluid milk prices of some $12/hl from current levels (e.g., $56/hl for Ontario) to the landed U.S. price of $44, or a decline of about $1.20/hl per year if there is a ten year adjustment period. In aggregate terms, given current fluid milk output of 27.2 M hl, this tariff reduction would mean a decline in industry revenues of $326 million, or 21 percent of total current fluid revenues. In fact, the decline would be somewhat less than this if we considered the increase in fluid milk consumption that would accompany the 21 percent price fall. The significance of this change in profitability can be compared with the situation for ice cream and yogurt; the fall in fluid revenues would be about ten times the decline experienced in the ice cream and yogurt markets. As in the case of industrial milk, there is also the likelihood of an expanded fluid milk import quota (TRQ) for the United States. This will not directly change the unit returns for fluid milk producers but it will lower individual farm fluid quota holdings, and hence also lower fluid milk sales.

With a price decline as large as it is in this case, the question of the competitiveness of this part of the milk industry is raised. Already there have been claims in the Canadian media of massive farm and job losses if the United States wins this NAFTA panel decision (e.g., Informetrica, 1995). The competitiveness of the fluid milk subsector, after tariff reductions are phased in, will depend upon whether the fluid milk processors can match the landed cost of imported fluid milk with no tariff. This depends, as for industrial milk earlier, upon the two component issues, whether farm fluid milk production in Canada is profitable at the U.S. farm gate milk price, and whether the processing sector's margins in Canada can match those in the United States.

At the farm level in those cases where fluid production is accounted for separately at farm levels (i.e., before fluid and industrial milk are pooled, or in those regions (if any) where pooling does not occur) one question is whether Canadian fluid operations can be profitable at a price of CDN$44/hl, assuming that Canada would be on an import basis vis-à-vis the United States. In this case the price with which Canadian farms must compete is the U.S. fluid milk price in the nearby would-be exporting state, plus the cost of transporting and importing that milk into Canada. This U.S. price will vary by state and the transport costs

will do likewise, so for a realistic answer to this question, a detailed analysis would be needed for each milkshed or province. In fact, it may be possible that milk coming into Canada from the United States could have been purchased at the U.S. industrial milk price fo Grade A milk. In this case, the landed import price of milk from the United States would be $41/hl, compared with the current Ontario fluid milk price of $56/hl. The question is whether Canadian fluid milk operations would be competitive at the $41/hl price.

The evidence on this matter was evaluated in more detail in the previous section, where farm cost data were reviewed with reference to a landed import price of $41 for U.S. industrial milk. The finding was that this would represent a fall in producer net market returns of some $5/hl or a net market return 8% lower than current levels. Even with no structural change in the milk industry since 1989 (e.g., no change in average herd size), average farmers would be close to meeting their average costs. Since there has already been considerable structural change since that time, and the process will almost certainly continue, it is likely that most farms could cover their costs at the landed import price of $41/hl. Therefore, it remains clear that Canadian dairy farms would be covering their costs for fluid milk based on imported U.S. product at $41/hl, although they would be receiving lower revenues than presently. Even if this were not so for the smallest farms, farms in the 60+ herd size range would be competitive.

On the processing side, the evidence is also similar to that discussed above for industrial milk, only fluid costs are even closer to U.S. levels. Price Waterhouse (1991) found U.S. costs only 2 percent lower than Canada's, and McClain found the U.S. advantage to be 13 percent. Revising such data to embody current exchange rates would almost certainly show Canada to be at a cost advantage. Further, we see merger and acquisition activity in fluid milk processing that is leading to larger firms with greater concentration, making it even more likely that Canadian plants will operate at higher capacity levels and with lower margins. The conclusion is that both farms and processors are most likely to be competitive with U.S. fluid milk imports if tariffs were removed, particularly if trends in consolidation and firm size in Canada continue.

However, if pooling of milk revenues becomes more widespread, the farm sector will be responding not to a separate industrial price and fluid price but a pooled price or weighted average of the two.[20] This will not affect processors but will primarily alter prices at the farm level. Pooling will preserve the results already noted above, except that the pooled price will exceed the industrial milk price. For a Canada-wide pool and landed import prices of $41/hl for industrial milk and $44 (or $41) for fluid milk, the weighted average price will be about $42.30/hl (or $41/hl). If pools are set up for smaller regions, the weighted price will depend upon the relative size of the fluid and industrial sectors, with prices closer to previous industrial milk levels in a province like Quebec with a larger proportion of industrial milk, and higher prices in a province like B.C. with a larger proportion of fluid milk. Therefore,

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[20]Editors note: It is interesting that a detailed discussion of impacts of freer trade retains the notion of administered prices. The U.S. and Canadian papers presented here all have vestiges of this economic anomaly.

pooling may make Canadian dairy farms more likely to be competitive than was discussed in section b) above for industrial milk, even if the Canadian industry's total revenues will remain the same as prior to pooling.

To conclude, fluid milk tariff removal will have a significant effect on the milk industry in Canada by lowering fluid milk revenues by about one-fifth. However, at current exchange rates and milk costs, the Canadian industry still will be competitive, possibly more so than in the case of industrial milk because landed import prices of fluid milk could be $3/hl higher than comparable industrial milk prices. From available evidence, this is just as true at the processor level as at the farm level. The situation is slightly modified when we take into account the pooling of industrial and fluid milk that is occurring across the country. Farmers then will have to face a marginal price on their total milk supply that is somewhat higher than on their industrial milk if that market was kept separate at the farm level. Instead of having to meet an industrial price of about $41/hl under no tariffs, with fluid milk included and pooled they would have to meet an overall milk price of $41-$42/hl with which more farmers would find themselves competitive. Again, there appears to be no basis for a prediction of dramatic decline in dairy farm numbers and processing plants following a Panel decision favouring the United States as reported in Informetrica (1995).

SUMMARY OF THE TWO SCENARIOS

Regional Distribution of production. The economic forces to redistribute milk production across regions of Canada are already present as outlined in Scenario 1, arising from the national pooling of milk and the imminent national quota exchange. They will benefit producers wishing to sell in the higher cost regions by raising their quota values, and will benefit producers wishing to expand in the lower cost regions by lowering quota values to them. Scenario 2 will add to these pressures to redistribute milk supplies, particularly in the adjustment period. Increased trade with the United States would occur first with lower milk prices, prompting farm consolidation and average herd expansion within Canada. This process of growth would occur during the adjustment period where tariffs would be declining, and would occur via quota transfers from high cost farms to lower cost farms. This would mean that higher cost regions also would see more of their quota moving to other regions, resulting in greater regional specialization in production. As noted in scenario 1, it is difficult with available information to predict exactly which provinces would expand and which ones would contract. Again, this process of increased regional specialization would occur in scenario 1 but would occurr more quickly under scenario 2.

Farm Structure. The size distribution of dairy farms has been changing over at least the last 30 years and under both scenarios 1 and 2 this process would continue and speed up. In fact, the data on average herd size shows that the process has already started. After years of slow increases in herd sizes, virtually all provinces now show that average herd sizes are increasing quickly in the last two years. This is exactly what one would expect as milk prices

are expected to decline, as farms can cut unit labour costs at larger herd sizes. If the U.S. size structure is any indication, this does not mean that Canadian dairy farms would be at the 1000+ herd sizes found in California. Rather, the likely result would be that economic farm sizes will begin around 50-70 cows. So there would be a substantial shrinking in the left hand tail of the current Canadian size distribution so that farms with fewer than 50 cows would become a rarity rather than the mean level as it is now in Ontario and Quebec. A good indication of future farm sizes probably can be found in the adjacent U.S. states. Ontario and Quebec farms would look like New York farms in average size (about 70 cows), while B.C. farms would be more like Washington State with somewhat higher average herd sizes.

Quota Markets and Values. The existence of quotas and quota markets would be different under scenarios 1 and 2. Under the first scenario, with URA provisions defining the extent and pace of tariff reductions, there would still be active quota markets at least to 2001. Following that, the pace of tariff reductions would be governed by the provisions of the next WTO round of trade negotiations. Quotas would be binding until world market prices plus applicable tariffs get close to Canada's domestic milk prices, and that may be some years after the end of URA tariff reductions (2001). Under scenario 2, the existence of quotas would be to the last year of the negotiated adjustment period.

Within this period of active quota markets, there would likely be increased quota demands and trade under either scenario. The mere existence of a national quota exchange would encourage more trading between regions to rationalize production and move toward greater equality in costs across regions and farms. There would also be more quota trading from the pressures that are mounting for farms to cut their costs by increasing herd sizes. This would be so particularly under scenario 2, under which there would be lower milk prices following the adjustment period. During this period the demand for quota would be expected to increase more than the supply, raising quota prices initially. This would be sustained into the adjustment period as quota demanders would likely be enjoying lower unit milk costs from their expansion, presumably until the last few years of quota trading when quota values become constrained by their limited future life. The late importance of this factor arises from the high discount rates that are associated with these quotas, typically in the range of 25 to 35 percent. When one factors in the likely increase in TRQs to the United States, it is even more likely to see quota values increase, because marginal returns will increase with a reduction in both MSQ and fluid quota.

Another interesting aspect of quota trading under scenario 2, is that there would be increased quota values for a number of years in several provinces, especially during the first half or more of the adjustment period. This would be relevant to those farms which exit the industry during that period because of the greater financial benefits from the higher values on the quota.

SUMMARY AND CONCLUSIONS

Dairy policy in Canada is a period of significant change, caused by the Uruguay Round Agreement (URA), possibly the NAFTA, and by federal government budget cuts. There are two main elements to this change, the modification of domestic policy to make it congruent with the disciplines of the URA, and the reduction in currently high tariff levels. The first class of changes is in the process of design and adoption. The second class of changes will ultimately occur as part the next Round of WTO trade negotiations, with agreement and implementation sometime after the year 2000. It is also possible that changes will occur more quickly if a NAFTA Panel hearing, brought on by the United States, decides in favour of the United States. In this case, policy change will occur quickly at the end of a tariff cut phase-in period. That would have to be negotiated.

Any price declines in Canada associated with freer trade will challenge the competitiveness of the Canadian industry. From available evidence, at current exchange rates and an open border with the United States, both farmers and processors will be competitive with U.S. milk and milk product supplies after a period of adjustment. This likely would require the increase in farm size that is occurring already as noted above. The main effect on the size distribution of Canadian dairy farms would be to reduce significantly the number of farms with fewer than 50 cows. Therefore, average herd size can be expected to increase from the current 40-50 cow range into the range of 70-100 cows. This would clearly result in an exit from the industry of a number of these small farms (although some will also be able to increase their size), but aggregate production levels could remain the same or even increase. If there were a large increase in the value of the Canadian dollar, the necessary adjustments would be greater and more difficult.

There will also be regional changes in the distribution of production across provinces, from higher cost provinces to those with lower costs, but we do not have evidence to predict which provinces are most likely to increase their share of national production. The last main point is that there is no evidence that the domestic industry will collapse from more open trade with the United States as has been predicted in some quarters. With an adjustment period, both farmers and processors are most likely to be competitive with the U.S. industry.

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