

## **THE CANADIAN DAIRY SECTOR: STRUCTURE, PERFORMANCE AND POLICIES**

*Agriculture and Agri-Food Canada*

The objective of this paper is to provide a description of the segments of the Canadian dairy sector, its structure and performance, and of the major policies which affect it.

### **THE MILK AND DAIRY PRODUCTS INDUSTRY<sup>1</sup>**

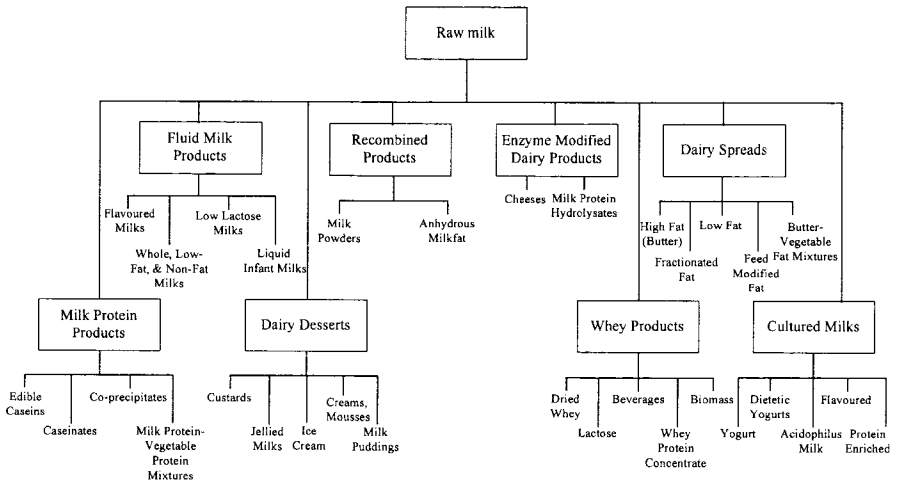
Raw milk is a combination of water, fat, proteins, lactose, and minerals. Production of manufactured products from raw milk involves the disaggregation and transformation of its constituent parts. The broad range of products derived from basic raw milk includes processed dairy products themselves, functional and nutritional food ingredients for use in other food and beverage processing industries, and industrial inputs for a variety of non-food manufacturing (Figure 1).

Demands for dairy products range from lower value, relatively undifferentiated, standardized products, to higher-value, differentiated, specialized, and premium priced products (Figure 2).

Industry has traditionally produced a wide range of consumer dairy products, such as fluid milk, butter, cheese, ice cream and yogurt. In the relatively undifferentiated and standardized market segments, competition can be more on the basis of price. Factors such as the larger volumes required to capture economies of scale and lower production costs can be important elements in competitive position. In the more differentiated, specialized and higher-value market segments, competition is more on the basis of attributes of the products for which premium prices are paid. In these product market segments, factors such as specialized ingredients and production processes used, research and development outlays, branding and marketing investments are critical competitive factors.

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<sup>1</sup> Based on Jelliss (1995).

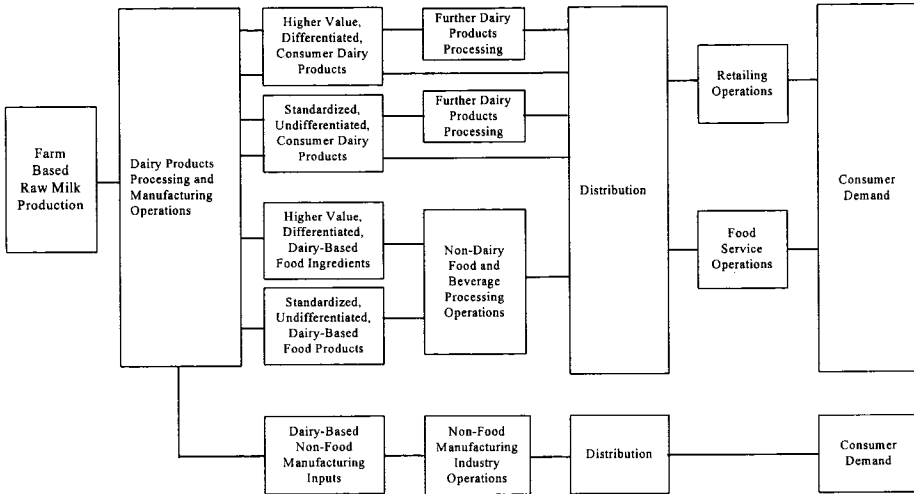
**Figure 1. Dairy Products Production Possibilities**

Source: Jelliss (1995) Adapted from Briant (1991).

Similar distinctions occur in dairy-based food ingredients markets. Competition in undifferentiated commodity market segments, such as that for standardized nonfat milk powders, may be more related to price considerations, whether in domestic or international markets. In specialized, more differentiated, dairy-based food ingredient markets, such as custom-designed milkfat mixes, special composition casein and whey based milk protein products, competition is more on the basis of the critical investments and competencies in product, process, market, and customer development.

Industrial demands for dairy-based manufacturing inputs derive from the use of particular milk constituents in the manufacture of products such as pharmaceuticals, virus combatants, beauty aids, glues, or knitting needles, as well as from their functional properties in such areas as immunology and the combating of tooth decay. Various industrial uses for milk-based constituent inputs are located in more technically advanced, higher-value market segments, where the special properties of the milk fractions involved are reflected in premium prices. Establishment and maintenance of a competitive position in these higher value market segments is frequently related to investments in research and development, product and process technologies, and customer relationships.

**Figure 2. The Milk and Dairy Products Value System**



Source: Jelliss(1995).

The relatively large investments in product, process, market and customer development required in the higher-value, more specialized consumer products and dairy ingredient markets are rewarded by higher margins and lower price sensitivities (Table 1).

**Table 1. Margins and Price Sensitivities in Different Dairy Product Markets**

Product Market Segment	Margins	Price Sensitivity
Dairy Commodities	Low	High
Dairy Ingredients	Medium-High	Medium
Consumer Dairy Products:		
- Standard	Low-Medium	Low
- Specialty	High	Low

Source: Jelliss (1995) based on Crocombe, Enright, and Porter (1991).

## PRESSURES FOR POLICY CHANGE

This section examines five factors which are expected to affect the future structure and performance of the dairy industry.

**Global Trends in Supply and Demand.**<sup>2</sup> The world dairy market experienced a particularly difficult period in the early 1980s. World recession reduced demand for dairy imports in third world and oil producing countries, while milk production in the EC and the United States rose significantly. The result was an increase in surpluses. Since then, there have been determined efforts to curb overproduction. However, the overall picture remains one of imbalance between supply and demand, with substantial sums of public money tied up in storing surplus stocks and underpinning markets. The danger persists that the dairy industry will remain caught between rapid technological progress, highly flexible production and the slow growth of import demand and consumption.

**Technological Change.** Embryo transplants, improved methods of genetic evaluation and selection, and improved management practices have contributed to a global increase in cow productivity. These genetic improvements are enhanced by developments in biotechnology such as the recent introduction of recombinant bovine Somatotropin (rbST). This synthetic version of a naturally occurring hormone has been found to increase milk production in average yielding cows. Recent estimates suggest that national production increases in the order of 4 percent are realistically attainable, although for individual cows the increase may be as high as 10-15 percent.

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<sup>2</sup>

Based on Grant (1991)

Improvements in filtration technology are enhancing the ability to extract specific ingredients and to develop niche market products. These same technologies are also changing the transportation economics for products by allowing the extraction of water, for example, which reduces the volume and the weight of the product and allows for transportation over greater distances. Such technological breakthroughs will provide a basis for another round of plant consolidation and relocation consistent with these changed transportation economics.

***Low-fat / Value-Added Market Shifts.*** The market for "traditional" dairy products, (i.e., milk, cheese, butter) is in decline. Specialty cheeses, yogurt, ice cream, and fast-food products, such as pizzas and cheese burgers, are a growing segment of the market. The use of dairy ingredients in further processed foods is a growing market.

The former market control rules and the new rules agreed in various trade negotiations do not allow the same degree of market protection for value-added products as for "traditional" dairy products. As this market segment expands, internationally competitive ingredient pricing will be increasingly necessary to support domestic processing and further processing industries.

Consumption trends affect the structure of the dairy industry and dairy policy. Butterfat, once considered the most important component of milk, is becoming a surplus component. Policies that encouraged farmers to produce milk with higher levels of butterfat have become obsolete because butterfat consumption is declining.

As the relative economics of production and processing shift, over the longer term, with changes in component values for milk and the dairy products produced from these components, there will be a need for structural adjustment at both the farm and processing levels.

***Freer Trade.*** Improvements in communications, financial transactions, transportation, packaging, processing, marketing and distribution have encouraged a global approach to the production, processing and marketing for most products, including agriculture and agri-food products. In response to "globalization", governments are negotiating new bilateral and multilateral trading rules which include the reduction of trade barriers. The dairy industry, one of the world's most protected industries, is affected by this policy shift more than other industries.

The Uruguay Round of the GATT resulted in tariffication of import quotas previously permitted under Article XI.2(c)(I). Domestic supply control is no longer a prerequisite for border controls. Under the CUSTA, both Canada and the United States retained their GATT rights with respect to agricultural goods. Under NAFTA, these rights were also protected and restrictions consistent with GATT Article XI or an "equivalent provision of a successor agreement" were specifically allowed.

Neither the CUSTA, NAFTA nor UR GATT have significantly affected the import protection afforded the Canadian and U.S. dairy industries. The changes resulting from these

negotiations are a clear indication that governments intend to further reduce trade barriers in the future.

***Fiscal Pressures.*** Budget pressures have stimulated major changes in the dairy market management systems of the European Union and the United States, and are a significant factor in overall Canadian policy reform.

### THE CANADIAN MILK AND DAIRY PRODUCTS SECTOR<sup>3</sup>

The milk and dairy products industry in Canada has operated within a heavily regulated policy environment. Domestic industry operations under a national supply management system have been largely insulated from international markets by a combination of quotas, tariffs, and other import control, industry support, and price stabilization arrangements.

Milk production in Canada is split into two commodity markets: the “fluid milk” market and the “industrial milk” market. Fluid milk products consist of standard milk (3.25 percent butterfat), lower fat milk (2 percent, 1 percent, skim), buttermilk, chocolate milk, and fresh creams. Industrial milk products are divided into two categories: 1) hard products, such as hard cheese, butter, and skim milk powder, and 2) soft products, such as ice cream, yogurt, and cottage cheese. Both the fluid and industrial milk markets use the same dairy input – raw milk. However, different regulations govern each market.

Price discrimination is extensively applied in the Canadian milk market. For example, in dairy year 1992/93 there were more than 50 different prices for milk according to end-use and province of production. Prices paid for milk differ between provinces, between milk markets (fluid versus industrial) and between industrial milk classes.

Individual dairy producers produced milk for one or both of these markets. Historically, there was a difference in milk quality between these two markets; today, virtually all milk is fluid quality.

Most industrial milk is processed into cheese in Canada, mainly cheddar and various specialty cheeses. Although cheese is a major dairy product from a production point of view, there is a large variety of dairy products on the market. As in the rest of the food industry, there has been a shift away from commodity markets to increasingly segmented niche markets. This shift has occurred mainly through extensions to existing product lines (e.g., low fat, flavours, packaging format). Examples of such highly segmented markets include cheese, yogurt and ice cream.

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<sup>3</sup>

Based on Jelliss (1995)

## **Economic Importance of the Canadian Dairy Sector**

The milk and dairy products industry ranks among the major industries in the Canadian agri-food sector in terms of farm cash receipts, processed product shipments, employment, value-added and contribution to gross domestic product (Table 2).

Altogether, dairy farming and processing industries generated sales of more than \$10 billion in 1992. Over the last three decades, the dairy industry has shown moderate growth (dairy farming 1.1 percent, dairy processing 1.9 percent), but slower growth than the rest of the agriculture and agri-food industries. Thus, dairy industry contribution to total agriculture and agri-food sector sales has declined slightly.

Dairy farming, ranked second of all Canadian agricultural commodities in value of sales, has maintained its importance for the last 30 years. From 1991-93 dairy products generated average annual farm sales of \$3.13 billion; 15 percent of market receipts for all agricultural products.

Dairy processing is the second ranked sector of the Canadian food and beverage processing industry (Figure 3). In 1992, dairy processing manufacturing shipments were \$7.46 billion; 16 percent of the value of manufacturing shipments of the food and beverage industry.

While employment data are not readily available, the number of commercial dairy farms reflects the minimum number of producers or families that make a living from dairy farming, as most dairy farms are family farms. According to the Canadian Dairy Commission (CDC), there were 29,350 farms selling milk or cream in Canada in 1993. Dairy farms accounted for 11 percent of all farms in 1991<sup>4</sup>.

The dairy processing industry, ranking second to meat and poultry in value of shipments, employed 24,600 people in 1992; about 11 percent of total food and beverage industry employees. This proportion has remained stable over the last decade. Of total dairy processing employees, 53 percent are in fluid milk, 47 percent in industrial milk processing.

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Among all the farms with sales of \$2 500 or more in 1991, 28,910 out of 256,182 farms were classified as dairy farms. (Statistics Canada, Census of Agriculture).

**Table 2. Importance of the Dairy Products Industry 1980 - 1991**

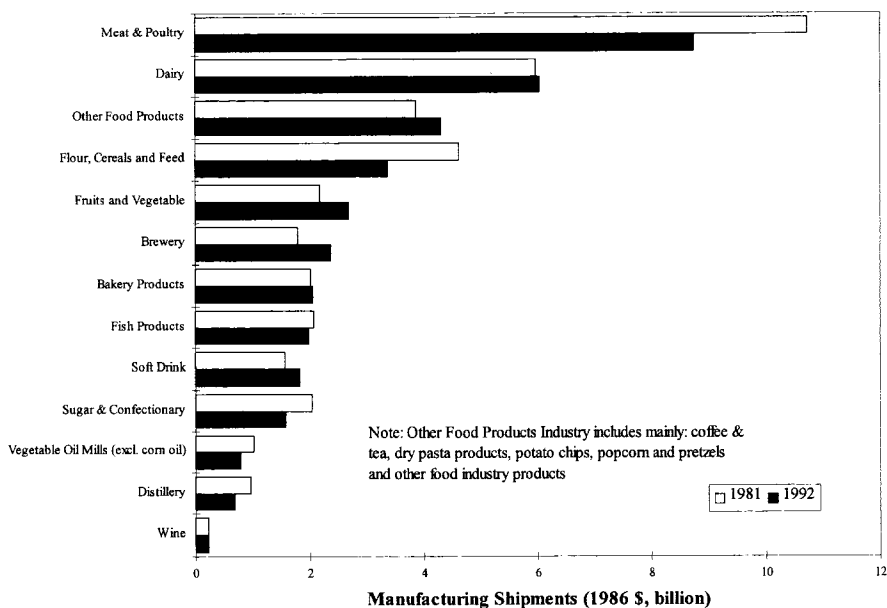
	Farm Cash Receipts (\$ millions)											
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Dairy Farm Cash Receipts	2,763	3,079	3,348	3,141	3,410	3,444	3,509	3,617	3,833	3,828	3,878	3,853
% of Total Farm Cash Receipts	17.7%	16.5%	17.6%	16.8%	16.9%	17.3%	17.1%	17.3%	17.7%	17.0%	18.0%	18.1%
Dairy Farming Industry Rank	3	3		2	2	2	2	2	2	2	2	2
	Processed Product Shipments (\$ millions)											
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Dairy Processing Industries	4,315	4,883	5,345	5,615	6,096	6,410	6,668	6,884	7,195	7,349	7,530	7,576
% of Food and Beverage Sector	15.3%	15.4%	16.2%	16.6%	16.9%	17.0%	17.0%	16.6%	16.7%	16.8%	17.0%	17.2%
Dairy Products Industry Rank	2	2	2	2	2	2	2	2	2	2	2	2
	Employment											
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Dairy Processing Industries	26,028	26,196	25,734	25,306	25,368	25,445	26,201	25,582	25,870	25,920	25,238	25,781
% of Food and Beverage Sector	11.1%	11.2%	11.3%	11.6%	11.6%	11.4%	11.6%	11.2%	11.1%	11.3%	11.4%	12.0%
Dairy Products Industry Rank	4	4	4	3	3	4	4	4	4	4	4	3
	Value Added (\$ millions)											
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Dairy Processing Industries	949	1,106	1,180	1,310	1,412	1,661	1,759	1,946	2,074	2,156	2,474	2,497
% of Food and Beverage Sector	11.4%	11.6%	11.5%	11.8%	12.0%	13.3%	13.2%	13.3%	13.5%	14.0%	15.0%	14.5%
Dairy Products Industry Rank	2	2	2	2	2	2	2	2	2	2	1	2
	Gross Domestic Product at Factor Cost (Current \$ millions)											
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Dairy Processing Industries	801	951	1,048	1,172	1,285	1,533	1,581	1,755	1,824	1,970	n.a.	n.a.
% of Food and Beverage Sector	11.6%	11.9%	11.9%	12.2%	12.5%	13.7%	13.3%	13.7%	13.8%	14.6%	n.a.	n.a.
Dairy Products Industry Rank	2	2	1	1	1	1	1	1	1	1	n.a.	n.a.
	Gross Domestic Product at Factor Cost (Constant 1986 \$ millions)											
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Dairy Processing Industries	1,490	1,523	1,398	1,273	1,381	1,586	1,581	1,636	1,582	1,548	1,567	1,545
% of Food and Beverage Sales	13.1%	13.4%	12.5%	11.7%	12.1%	13.2%	13.3%	13.7%	13.2%	13.2%	13.3%	13.6%
Dairy Products Industry Rank	1	2	1	2	1	1	1	1	1	1	1	1

Note: Dairy products industry ranking is based on a comparison of all 3-digit food and beverage product industries excluding that of miscellaneous food products.

Source: Dairy Farmers of Canada, 1992 and various issues; Statistics Canada, various sources (as cited in Jelliss, 1995).



**Figure 3. Real Manufacturing Shipments by Major Food and Beverage Sector Canada, 1981 and 1992**



## STRUCTURE AND PERFORMANCE OF THE CANADIAN DAIRY SECTOR

This section reviews structural changes in the dairy sector at both farm and processing levels over the past several decades. These include changes in number and size of farms and firms, and regional distribution of farms, firms, production and consumption. It also reviews dairy sector financial structure including, assets, liabilities, income, profitability, investment and return on investment.

Performance measures reviewed include production growth; trends in prices, margins, market share, and multifactor, labour and capital productivity; output measures per cow, per farm, per firm, per labour hour; cost of production estimates for farms and firms; and some indication of size or scale economies.

### Physical Structure

In 1992, 29,358 dairy farms, with slightly less than 1.9 million milk cows and dairy heifers, shipped about 68.7 million hectolitres of milk and cream to Canadian dairy processing plants, generating a total value of almost \$3.3 billion in farm cash receipts.

Approximately 27.3 million hectolitres (39.7 percent), were sold for fluid purposes, and 41.5 million hectolitres (60.3 percent), for industrial purposes, including 1.2 million hectolitres shipped as cream.

Processing occurred at 308 plants across Canada, employing a total workforce of 24,614 persons, and producing some \$7.4 billion of processed dairy products shipments. Just under \$3.5 billion (47 percent), shipped as fluid milk products, and slightly less than \$4 billion (53 percent), as industrial milk products.

An estimated \$185.2 million of these shipments were exported, \$17.1 million (9.2 percent), as fluid milk products, and \$168.1 million (90.8 percent), as industrial milk products. Offsetting this were an estimated \$189.4 million of dairy product imports, \$2 million (1.1 percent), of which were classified as fluid milk products, and \$187.4 million (98.9 percent), as industrial milk products.

Distribution to consumers, primarily in the form of dairy products or as ingredient inputs in other processed food and beverage products, occurred through a network of just over 30,000 retail food stores and more than 114,000 food service industry outlets. These food service industry outlets included the activities of licensed and unlicensed restaurants, accommodation, leisure industry, and institutional food service operations, as well as distribution channels provided by vending, department store, and other retail food service industry outlets.

Table 3 provides an overview of Canadian milk and dairy products industry operations in 1992.

**Table 3. Overview of Canadian Dairy Industry Operations - 1992**

<b>MILK PRODUCTION OPERATIONS</b>	
Number of Farms Shipping Milk or Cream 1992/93	29,358.0
Number of Milk Cows (thousand head)	1,290.5
Number of Dairy Heifers (thousand head)	592.5
Total Farm Sales of Milk and Cream (millions of hectolitres)	68.7
Farm Cash Receipts from Dairying (millions of \$)	3,271
<b>PROCESSING AND MANUFACTURING OPERATIONS</b>	
Number of Dairy Processing Plants	308.0
Production Workers	14,523.0
Total Employment	24,614.0
Shipments (millions of \$)	7,449
Exports (millions of \$)	185.2
Imports (millions of \$)	189.4
<b>RETAIL AND FOOD SERVICE OPERATIONS</b>	
Retail Food Stores	30,163.0
Food Service Industry Outlets	114,196.0

Note: Food service industry outlets include licensed and unlicensed restaurants, take-out and delivery and social/contract caterer operations, pubs/taverns/lounges, accommodation, leisure industry and institutional food service operations, as well as vending, department store, and other retail food service activities.

Sources: Jelliss (1995). Based on information provided in Dairy Farmers of Canada (1993); Statistics Canada (1992a, 1994); ISTC (1993); Canadian Grocer (1993); Canada Restaurant and Food Services Association (1993).

### **Number and Size of Dairy Farms**

The family farm orientation of the Canadian dairy industry is not unlike that of the United States or other major milk producing countries in Europe or Oceania. However, the average size of dairy farms in the main Canadian milk producing regions, and in Canada as a whole, is noticeably smaller than in the United States and a number of other competitor countries (Table 4).

About 29 thousand farms sold milk or cream (quota holders)<sup>5</sup> in 1993, compared with 174 thousand in 1968, a reduction of 145 thousand farms. Over the last 25 years, about one farm out of six has remained in the dairy sector. Compared with other farm types in Canada,

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<sup>5</sup>

As defined by the Canadian Dairy Commission.

the number of dairy farms has dropped the most, with small dairy farms showing the greatest decline.

**Table 4. Average Size of Dairy Farms in Canada, the United States, and Other Countries 1989**

COUNTRY/REGIONS		NUMBER OF DAIRY FARMS	NUMBER OF COWS PER FARM
CANADA	Quebec	14,969	38.5
	Ontario	12,000	40.6
	Alberta	2,340	52.6
	B.C.	1,050	71.4
	Canada	36,445	42.5
U.S.	North-East	32,300	66
	South-East	1,200	245
	Pacific	4,500	339
	Midwest	54,850	54
	U.S.	128,000	79
OTHER COUNTRIES	Netherlands	35,000	55
	New Zealand	14,000	164

Source: Janelle (1992)

Average dairy farm size was 45 cows<sup>6</sup> in 1993. Canada's dairy farms are still characterized as small and medium size enterprises, mainly family operations, but there is a trend toward larger dairy farms.

### Number and Size of Dairy Processing Firms

Canadian dairy processing plant numbers decreased from 880 in 1970 to 308 in 1992, and plants increased in size. (Figure 4) Small plant numbers decreased the most. The pace of rationalization was faster in dairy processed products than in the fluid milk industry. From 1982 to 1992, the number of fluid milk plants decreased from 168 to 140 (-17 percent), while the number of other (non-fluid) dairy products plants decreased from 232 to 168 (-28 percent).<sup>7</sup>

<sup>6</sup>

Average for farms being classified as dairy farms, Farm Financial Survey (1994).

<sup>7</sup>

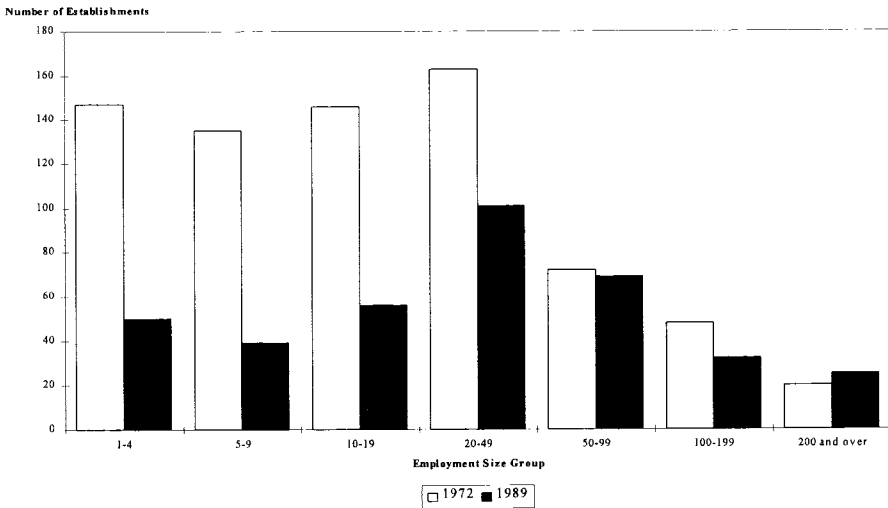
Statistics Canada, Census of Manufacturers.

In 1992, dairy plants employed 80 persons per plant, on average, up from 35 in 1970. Employees per plant averages higher in the dairy industry than the food industry (excl. beverages) as a whole.

**Regional Distribution of the Dairy Industry**

Dairy farm numbers have been declining in all provinces; more rapidly on the Prairies. Quebec is the only province to significantly increase its relative share of dairy farms in Canada. Quebec and Ontario, collectively account for over 70 percent of Canadian dairy industry operations (Table 5).

**Figure 4. Number of Dairy Processing Plants by Employment Size Group Canada, 1972 and 1989**



**Table 5. Regional Distribution of the Dairy Industry in Canada**

	Atlantic	Quebec	Ontario	West
	<i>percentage share of Canada</i>			
<b>Dairy Farming</b>				
Dairy Farms (1993)	5%	43%	33%	18%
Dairy Cows (1994)	6%	39%	34%	22%
Production <sup>1</sup> (1993)	6%	38%	34%	22%
Dairy Cash Receipts (1991-93)	6%	36%	34%	23%
<b>Dairy Processing<sup>2</sup></b>				
Establishments (1989)	12%	26%	35%	27%
Total Employees (1989)	10%	34%	33%	24%
Manuf. Value Added (1989)	7%	46%	30%	18%
Population (1993)	8%	25%	37%	29%

Source: Based on Statistics Canada.

<sup>1</sup> Production (shipments) in milk equivalents, butterfat basis.

<sup>2</sup> Note: regional data related to processing are not available for a more recent period.

Fluid milk production and processing industries are distributed across provinces consistent with their population base (Tables 5 and 6). Industrial milk industries are more concentrated in central Canada, with Quebec accounting for almost half and Ontario for approximately 30 percent, of Canadian industrial milk production.

## Production

Canadian milk production has been stable over the last 40 years. Other major commodities increased substantially, and both U.S. and world milk production increased significantly (Figure 5). Dairy products production is almost exclusively oriented toward the domestic market.

**Table 6. Regional Distribution of Dairy Production and Population**

	Maritimes <sup>1</sup>	Quebec	Ontario	Prairies	B.C.	Canada
<b>Butterfat Production ('000 kg)</b> <b>three-year average 1991-92-93</b>						
Fluid Milk	7,372	27,850	43,151	18,405	12,643	109,422
as a percent of Canada	7%	25%	39%	17%	12%	100%
Industrial Milk and Cream	7,190	73,399	49,160	20,321	6,812	156,880
as a percent of Canada	5%	47%	31%	13%	4%	100%
Total Dairy (butterfat)	14,562	101,249	92,311	38,726	19,455	266,302
as a percent of Canada	5%	38%	35%	15%	7%	100%
<b>Population in 1993</b>						
millions	1.8	7.2	10.7	4.8	3.5	28.8
as a percent of Canada	6%	25%	37%	17%	12%	100%

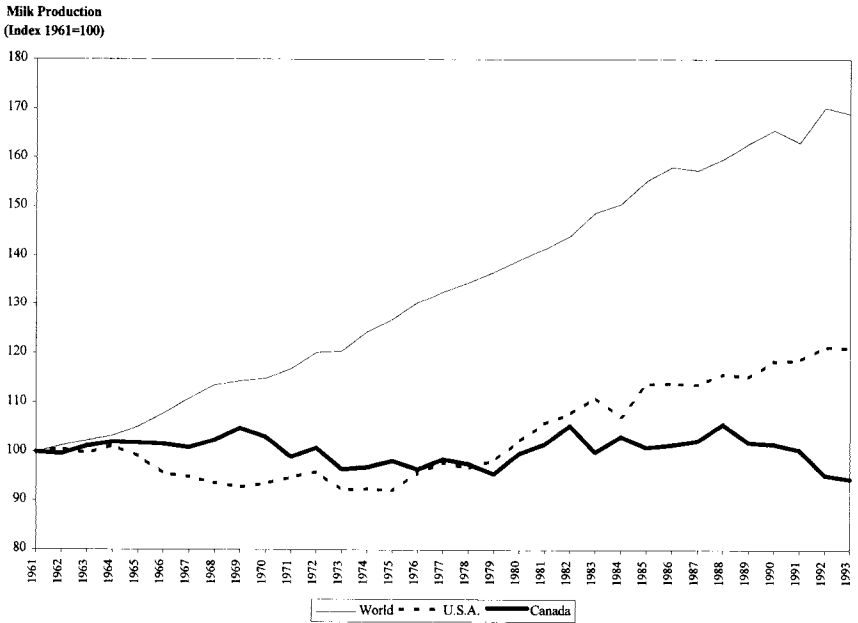
<sup>1</sup> Excludes Nfld.

Source: Statistics Canada

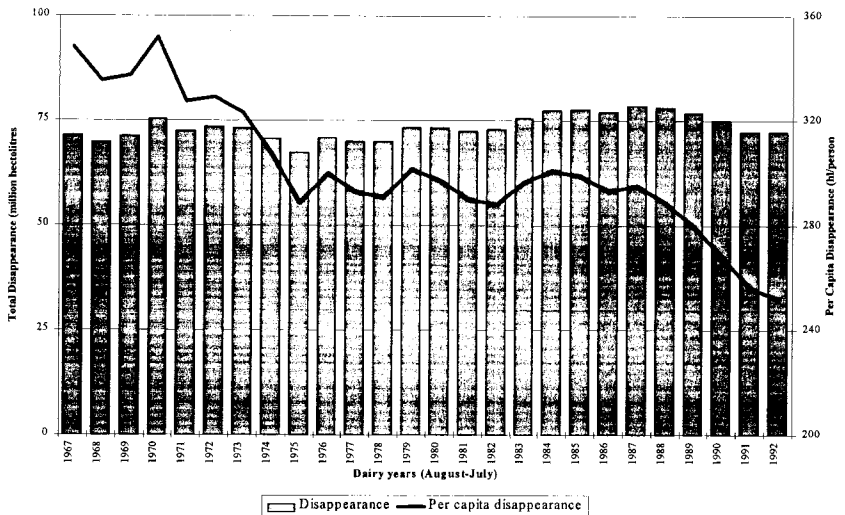
## Consumption

Aggregate per capita disappearance of all milk and dairy products (in milk equivalents, milkfat basis) has decreased in Canada (Figure 6). This overall decline in dairy products consumption derives mainly from a declining overall trend in the consumption of fats. There are, however, some divergent trends between individual dairy products. For example, the demand for certain higher butterfat content products (such as whole milk, butter) has been reduced, while the demand for certain high-value products (such as specialty cheeses) and those perceived as more healthy (such as yogurt) has increased.

**Figure 5. Milk Production Index 1961-1993: World, United States, Canada**



**Figure 6. Total and Per Capita Disappearance of Dairy Products: Canada 1967-1992 (milk equivalents, butterfat basis)**





The shift in consumption patterns of milk and dairy products has been attributed to three major factors (Nagengast, 1994). First, consumer awareness of the relation between health and diet has stimulated the demand for reduced-fat, reduced-calories food products. Second, some decades ago, milk was popular with children at meals and snack time, and the large numbers of children born in the 1950s affected the volume of milk consumed. In more recent decades, soft drinks and juices came to dominate consumption patterns, and the baby-boom was followed by a slow population growth. Third, although milk and dairy products are mainly consumed at home, products such as cheese have benefited substantially from the quick service restaurant with the popularity of products such as pizza, tacos, and cheeseburgers. In addition, frozen dairy products in specialized retail outlets (e.g., ice cream and frozen yogurt) have become a popular segment. These factors appear to be consistent with Canadian experience.

## Trade

Imports and exports of dairy products represent a small portion of Canadian production, as expressed in milk equivalents, butterfat basis. Dairy products account for a very small portion of Canadian agri-food exports (1 to 2 percent) and these exports decreased moderately in the early 1990s (Table 7).

**Table 7. Trade Balance for Dairy Products in Canada 1989-1993  
(Million Dollars)**

	1989	1990	1991	1992	1993	1989-1993 annual change
Imports	152	158	153	181	200	+8%
Exports	188	194	186	187	152	-5%
Balance	36	35	33	6	-49	

Source: Statistics Canada Trade Data.

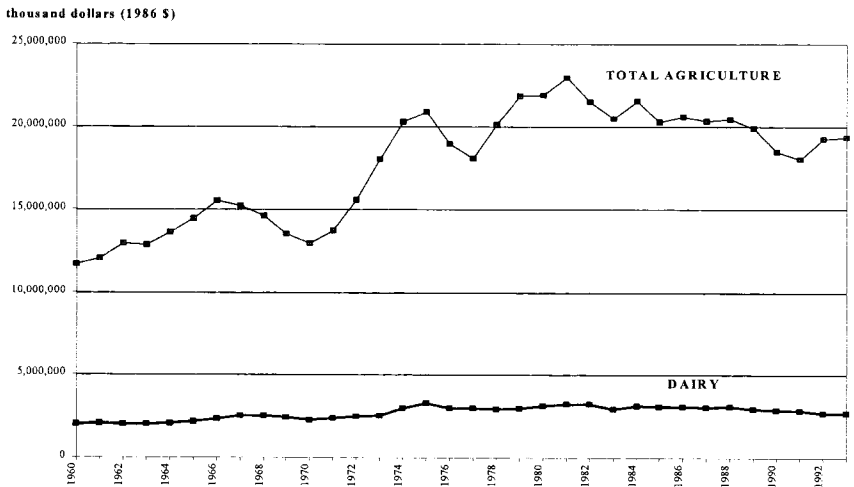
Note: total may not add up due to rounding.

## FINANCIAL STRUCTURE

### Farm Cash Receipts

Real dairy farm cash receipts have grown very moderately, at a more stable, but much slower, pace than the aggregate agricultural sector. This has resulted in a decline in the dairy industry share of total farm cash receipts (Figure 7).

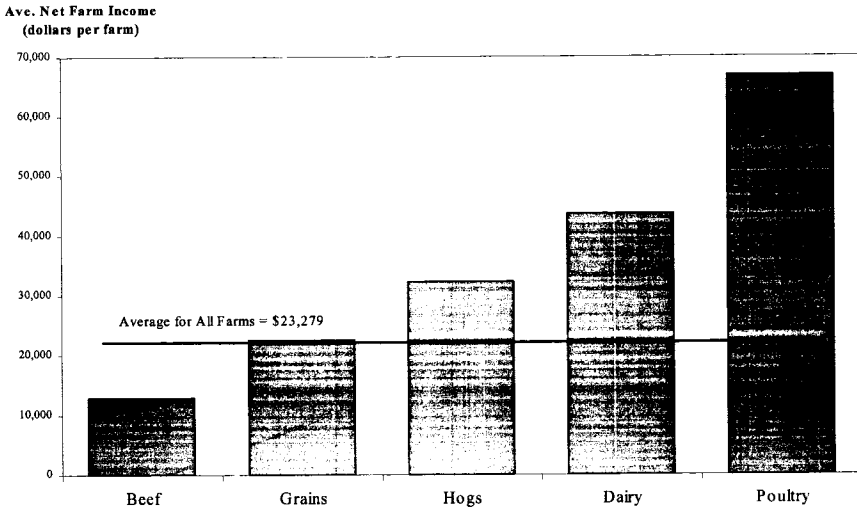
**Figure 7. Farm Cash Receipts, Total Agriculture and Dairy 1960-1993**  
(constant 1986 dollars)



### Net Farm Cash Income

As farm numbers declined and dairy receipts increased, average net farm cash income for dairy farms has increased substantially. It is now well above average for the agricultural sector and the second highest average net farm cash income in Canadian agriculture by farm type (Figure 8).

**Figure 8. Net Farm Income by Major Farm Type, Canada Average 1989-93**



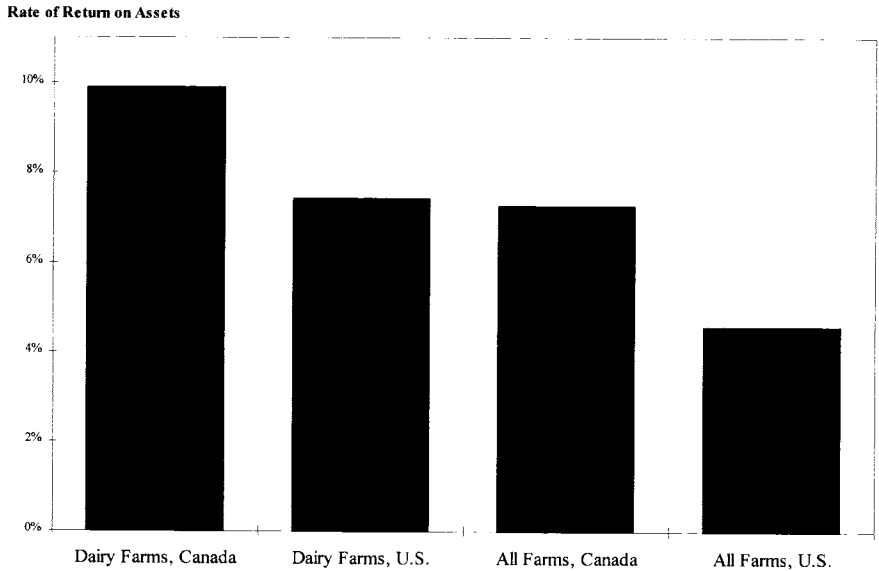
**Table 8. Returns on Assets and Equity in Canadian Agriculture 1989-93**

	Dairy Farms	All Farms
<b>Returns on Assets</b>		
1989	9.6%	7.1%
1991	9.9%	7.2%
1993	8.0%	6.2%
<b>Returns on Equity</b>		
1989	9.6%	6.7%
1991	9.9%	6.9%
1993	8.0%	6.0%

Source: Calculations based on Farm Financial Survey Data

**Return on Assets**

Return on assets for dairy farms in Canada was 9.9 percent in 1991 (Table 8). This is above the rate of return for all farms in Canada (7.3 percent) and also above the same rate for U.S. dairy farms (7.4 percent) shown in Figure 9.

**Figure 9. Return on Assets for Dairy and All Farms, Canada and United States: 1991**

### Production Costs: Farm Level

Table 9<sup>8</sup> shows that average Canadian raw milk production costs are generally above those in the United States and countries such as the Netherlands, and significantly above those in very low-cost countries such as Ireland and New Zealand. The only exception to this relative ranking is a Price Waterhouse cost comparison between Canada and the United States done for the National Dairy Task Force. This study suggested that Quebec costs could be approximately equivalent to the average of those in the United States as a whole and slightly lower than those in twenty Northeastern U.S. states. Estimated Ontario costs remained higher than both. Wages paid, paid and unpaid family labour and return to equity were excluded from cost comparisons in this study. There is also considerable variation between average production costs in different Canadian provinces and U.S. states. In general, Alberta appears to have the lowest raw milk production costs among Canadian provinces, and California the lowest among reviewed U.S. states.

There also can be wide variations in production costs between the high-cost and low-cost raw milk producers within individual Canadian provinces.

<sup>8</sup> Given the diversity of estimating procedures, data sources, and time periods, Table 9 summarizes various raw milk cost-of-production estimates in index form.

**Table 9. Indices of Recent Canadian, U.S., and International Raw Milk Production Cost Estimates**

	Jeffrey	Baker, Hallberg, Tanjuakio, Elterich Beck, and Liebrand	Phillips, White and Stonehouse	ISTC	Price Waterhouse	Nicholson and Knoblauch	Hamm and Nott
<b>Canada</b>		100		100			
Alberta	100						
Manitoba	109						
N.B.			100				
Quebec	113		102	120	100		
Ontario	121		112	118	105	100	100
B.C.	127						
Sask.	130						
<b>U.S.</b>		71	93		100		
California	78			79			
Minnesota	85						
Washington	94						
Wisconsin	99			89			
New York				90		74-77	
Michigan							96
Northeast					104		
<b>Netherlands</b>		72	83				
<b>Ireland</b>		45					
<b>New Zealand</b>		30	25				

Source: Jelliss (1995) calculated from data in Jeffrey (1992); Baker, Hallberg, Tanjuakio, Elterich, Beck and Liebrand (1990); Phillips, White, and Stonehouse (1989); ISTC (1991b); Price Waterhouse (1991a); Nicholson and Knoblauch (1993); Hamm and Nott (1986). Each index is based on the lowest Canadian cost in each study.

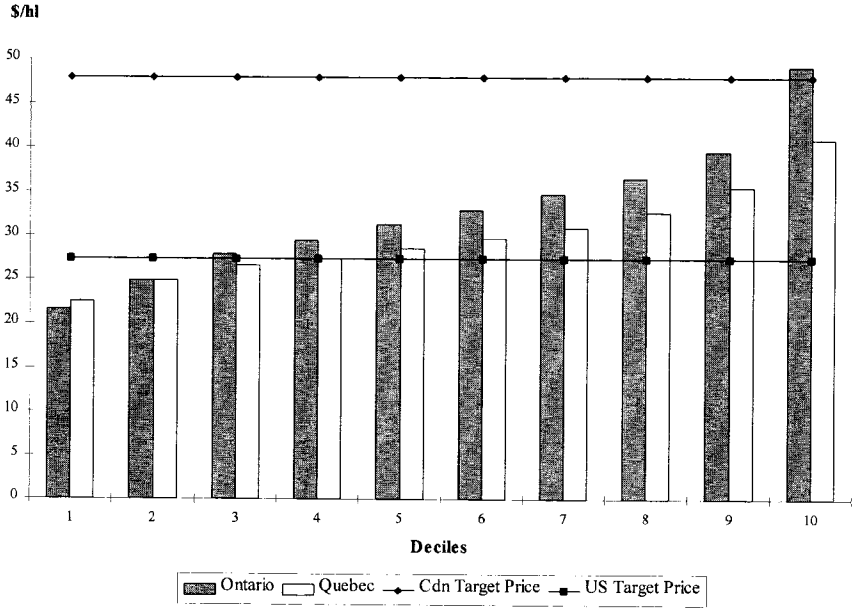
Within province raw milk production costs for Ontario and Quebec are estimated to have ranged from slightly above to generally below the Canadian target price for industrial milk in 1990 (Figure 10). They also ranged from noticeably above to somewhat below the 1990 support price for U.S. raw milk.

### Production Costs: Processing Level

With regard to cost competitiveness in the Canadian dairy processing industry, subject to the influence of exchange rate fluctuations, the input price of Canadian raw milk supplies is generally higher than in the United States and a number of other competitor countries. (Table 10) However, once this is accounted for, there remains a noticeable variation in estimates concerning the competitiveness with which dairy processing industry operations themselves are conducted.

Canadian dairy processing costs are generally above those in the United States, with the extent of the Canadian cost disadvantage being more noticeable in certain product lines than in others.

**Figure 10. Ontario and Quebec Industrial Raw Milk Production Costs by Producer Deciles - 1990**



**Table 10. Indices of Recent Canadian and U.S. Dairy Processing Cost Estimates**

	Fluid Milk		Cheddar Cheese		Butter		Skim Milk Powder		Ice Cream		Yogurt	
	Can.	U.S.	Can.	U.S.	Can.	U.S.	Can.	U.S.	Can.	U.S.	Can.	U.S.
ISTC			100	100					100	100	100	100
Price Waterhouse (Manufacturing only)	100	98	100	77	100	88	100	83	100	76	100	88
McClain (Manufacturing only)	100	87							100	94		
Price Waterhouse (Total Processing)	100	87							100	54	100	89
McClain (Total Processing)	100	88							100	96		
Official Processor Margins					100	44	100	44				

Source: Jelliss (1995). Calculated from data in ISTC (1991b); Price Waterhouse (1991a, 1991b, 1991c); Canadian Dairy Commission (1993c); Commodity Credit Corporation (1993). Canada =100.

The one exception to this relative ranking involves an ISTC study which suggested that potential Canadian cost competitiveness could be equivalent to that of the United States for commodity cheddar cheese, ice cream, and yogurt. This analysis, based on an engineering cost study methodology, measured potential cost competitiveness on the basis of hypothesized investments in newly constructed, state-of-the-art processing plants, operating at full capacity utilization and optimal internal plant operating efficiencies. The study was not designed to assess cost competitiveness of actual Canadian and U.S. dairy processing plants under the conditions which these plants would in fact be conducting their operations at any given time (Jelliss, 1992).

As in the case of milk production, the higher costs in Canada could be due to higher input prices and the efficiency or productivity of processing operations. With respect to productivity, multifactor productivity in the Canadian dairy processing industry between 1961 and 1989 on a gross output basis is estimated to have increased approximately 6.1 percent. However, most of this improvement occurred before 1980. Between 1980 and 1989, multifactor productivity growth in Canadian dairy processing is negative, declining approximately 1.9 percent over this period (Statistics Canada, 1993e).

In summary, subject to the influence of exchange rate fluctuations, Canadian production costs are generally above those of the United States in both raw milk production and dairy products processing. Lower-cost Canadian milk producers may be cost competitive with certain of their higher-cost U.S. counterparts, and individual Canadian processing plants may also be cost competitive with certain of those in the U.S. Canadian raw milk production cost is considerably above that of extremely low-cost producers such as New Zealand. Cost competitiveness of Canadian dairy processors vis-a-vis competitors in countries other than the United States remains subject to further verification.

### **Organizational and Market Structure**

Dairy farming is one of the least concentrated major agricultural sectors in Canada, with only 28 percent of production realized by the largest 10 percent of dairy farms.

Institutional arrangements can influence the way firms compete with each other and, thereby, industry performance in both cost and product competitiveness terms. For example, the supply management system has tended to constrain the degree of processing industry rivalry through such factors as restrictions on the movement of fluid milk beyond the province of origin, barriers to entry associated with quota systems (including plant supply quotas in some provinces), domestic industry protection from import competition, and difficulties incurred by processors in obtaining raw milk supplies for particular manufacturing purposes (Brinkman, et al, 1993, pp. 50-53).

The regulation of prices by provincial authorities for both fluid and industrial milk in all provinces except Prince Edward Island (where only fluid milk price is regulated), constrains rivalry within the industry on the basis of price (Deloitte & Touche, 1992). Within this context, however, Canadian dairy processing firms have tended to compete over time for increased market shares in particular industry market segments, for increased shares

of industrial raw milk supplies, and through profitability improvements from increased plant operating efficiencies (ISTC, 1992a).

The degree of rivalry may also have been influenced over time by continuing merger and acquisition activity and increase in industry concentration at both the national and provincial levels. Recent consolidation activities involving cooperatives such as Agropur in Quebec and Dairyworld Foods in British Columbia, have been designed in part to combat perceived threats to competitive positions from investor-owned multinationals such as Beatrice and Kraft-General Foods, and to better position the companies concerned for possible changes in provincial government regulations and altered international trading rules (Co-operatives Secretariat, 1992).

The 4-firm concentration ratios for the Canadian fluid milk products industry increased from 1983 to 1992, while concentration changed little in the industrial milk products industry (Table 11). These are national data and do not necessarily reflect the degree of concentration for particular product segments nor geographic areas.

Notwithstanding involvement of individual dairy products companies (Ault Foods in Ontario, Agropur coopérative agro-alimentaire in Quebec, and Dairyworld Foods in British Columbia) in foreign market activities, Canadian-owned companies have comparatively little experience in dairy industry operations and differentiated customer requirements outside the domestic market. The largely domestic and regional focus of the Canadian dairy products industry limits participation in more dynamic markets elsewhere. It also limits development of expertise in international production, marketing, sales and distribution characteristic of more internationally oriented competitors in Europe, New Zealand, and the United States. However, a number of large Canadian subsidiaries of multinational firms may have access to such expertise in serving foreign markets.

**Table 11. 4-firm Concentration Ratios in the Canadian Dairy Products Processing Industry: 1983-1992**

	<b>Fluid Milk Industry</b>	<b>Industrial Milk Products Industry</b>
1983	41.9%	48.1%
1984	48.3%	47.1%
1985	48.5%	47.7%
1992		50%+

Source: 1983-1985: Statistics Canada (1986); 1992: ISTC (1992a), cited by Jelliss (1995)



## Ownership Structure

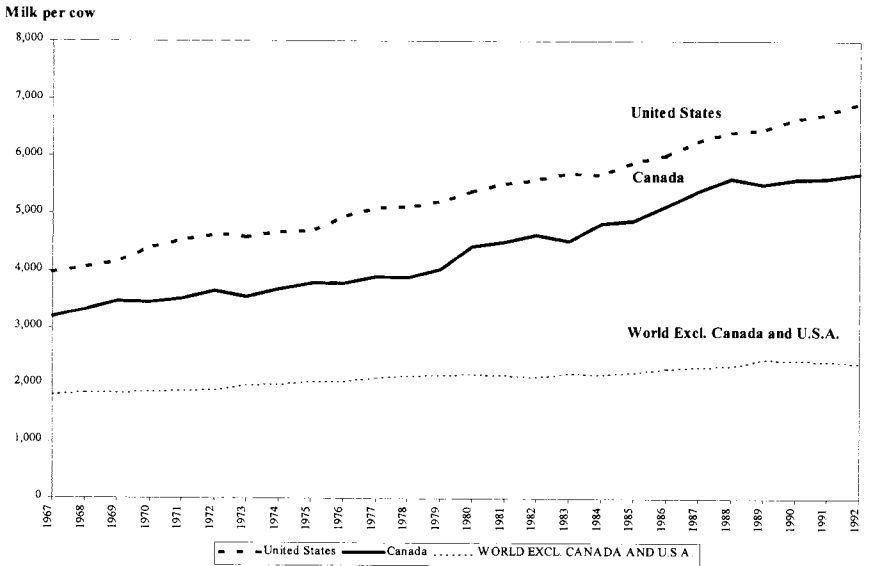
A structural characteristic of the dairy industry in Canada and other countries is the prominent role of cooperatives. About one-half of Canadian dairy processing firms are cooperatives, owned by the dairy farmers who provide their raw milk supplies. Approximately 35 percent are publicly traded investor-owned companies. The remaining 15 percent are generally smaller, privately held, investor-owned operations. Investor-owned firms are relatively more prominent in fluid milk operations. Cooperatives are relatively more prevalent in industrial milk processing activities (ISTC, 1992a). Cooperatives hold leading positions in milk marketing and dairy products processing in all provinces, except Ontario, where their market share is estimated at 20 percent (Sullivan, 1992).

The relationship between form of ownership and industry competitiveness is not clear. Lambert and Romain (1992) reported that from 1977-1986 labour productivity in the strongly cooperative Quebec processing industry was consistently above that in Ontario and the rest of Canada combined. However, they also reported that the trend of labour productivity in Quebec from 1977-1986 showed a relative decrease compared to that in Ontario and the rest of Canada. While these results could be due to factors unrelated to ownership, Lambert and Romain found that the decrease in labour productivity in Quebec was concentrated in the cooperatives segment of the industry while labour productivity in the investor-owned segment increased. Investor-owned firms appear to hold a relatively greater market share in growing segments of the market, processing an estimated 78 percent of milk used for specialty cheeses, 49 percent of that for yogurt, ice cream, and cottage cheese, and 37 percent of that consumed in fluid form in 1989 (GREPA, 1990). A question to be addressed, therefore, is the role that differences in the organizational, management, and goal structures of cooperatives and investor-owned firms may play in such divergent competitiveness trends.

## PERFORMANCE INDICATORS

**Productivity Per Cow.** Although average yield per cow is below that for the United States (Figure 11), productivity per cow has increased continually over the past several decades.

**Figure 11. Average Yield Per Cow: Canada, United States, Rest of World: 1967-1992**



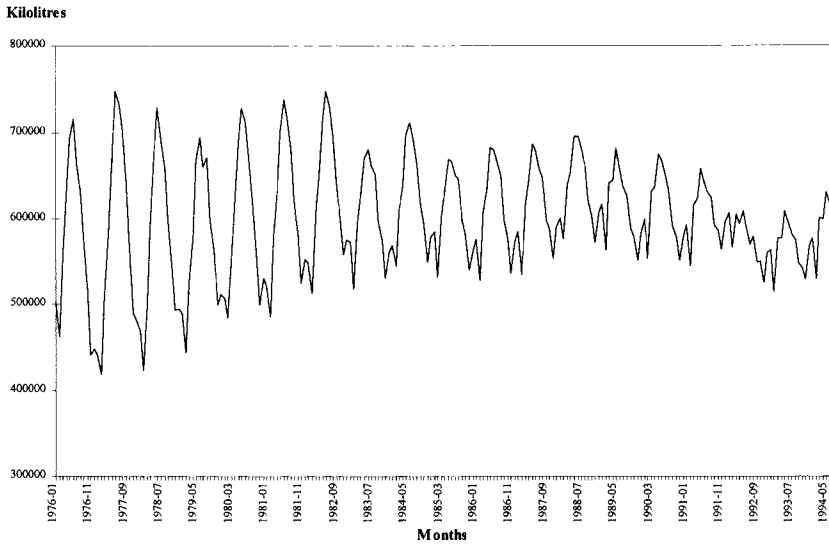
**Production Stability.** Milk supply has evolved toward more stable production throughout the year (Figure 12).

**Financial Performance Indicators by Farm Size.** Performance indicators vary by farm size (Table 12). For instance, dairy sales per cow increase with the size of the enterprise (number of cows or value of sales), suggesting that larger farms are more productive.

**Growth in GDP.** For the period 1961 to 1993, the Canadian dairy processing industry has grown more slowly, in terms of gross domestic product (GDP), than the rest of the food and beverage industry. Dairy processing GDP (constant dollars) increased by 1 percent annually, compared with 3 percent, 7 percent and 7 percent, respectively, for the rest of the food and beverage industry, for the rest of the manufacturing industry and for the entire economy. As a result, the dairy processing share of food and beverage GDP declined from 16 percent to 12 percent.

Real growth in GDP declined from the 1960s to the 1970s for both the dairy processing industry and the food industry as a whole. In the 1980s, both have shown increases, but at a slow pace, with dairy processing growing slower than the food industry.

Figure 12. Monthly Milk Deliveries, Canada: January 1976-June 1994



**Table 12. Selected Characteristics of Canadian Farms by Sales Class: 1993 (1)**

	less than \$25,000	\$25,000 \$49,999	\$50,000 \$99,999	\$100,000 \$249,999	\$250,000+	all classes
<b>Dairy Farms as a % of all dairy farms</b>						
Number of Dairy Farms	2.3%	5.2%	25.8%	52.9%	13.9%	100%
Quota	0.5%	1.6%	13.7%	54.1%	30.2%	100%
Total Assets	0.8%	2.2%	15.2%	53.6%	28.2%	100%
Farm Revenue	0.3%	1.3%	13.4%	53.8%	31.3%	100%
Dairy Sales	0.2%	1.2%	12.9%	53.8%	31.8%	100%
<b>Average per farm</b>						
Net Farm Income \$	479	13,860	22,425	45,082	100,213	44,245
Total Govt. payments \$(2)	2,503	4,468	10,507	15,690	23,663	14,575
Average number of cows	17	22	30	45	81	45
<b>Financial Indicators</b>						
Margin before int.& sal.	9.8%	41.7%	39.0%	41.9%	43.1%	41.8%
Returns on Equity (3)	0.47%	4.35%	6.33%	8.01%	9.44%	7.99%
Returns on Assets (3)	0.62%	4.66%	6.56%	8.03%	9.09%	7.98%
<b>Average per cow</b>						
Dairy sales/cow (\$)	762	1,370	2,155	2,912	3,681	2,915
<b>All Farms excluding Dairy as a % of all farms excl. dairy</b>						
Number of Farms	42.5%	18.0%	16.9%	15.6%	7.0%	100%
Quota	0.8%	1.1%	4.6%	19.9%	73.6%	100%
Total Assets	22.5%	13.0%	17.5%	23.3%	23.7%	100%
Farm Revenue	5.5%	7.5%	13.7%	25.6%	47.7%	100%
<b>Average per farm</b>						
Net Farm Income \$	-1,113	8,361	20,218	39,089	151,613	21,125
Total Govt. payments \$	2,858	7,888	13,628	20,242	35,867	10,594
<b>Financial Indicators</b>						
Margin before int.& sal.	2.9%	28.3%	34.2%	33.9%	30.0%	29.9%
Returns on Equity (3)	-0.28%	2.83%	4.94%	7.03%	12.76%	5.69%
Returns on Assets (3)	0.15%	3.21%	5.23%	7.14%	11.66%	5.88%

Source: Based on Farm Financial Survey 1994.

- Notes: (1) Adjustments made to data in order to exclude non-farm operations.  
(2) Government payments for dairy farms include non-dairy payments.  
(3) Returns include wages and salaries paid to family members.

### Labour and Capital Productivity

Canadian dairy processing labour and capital productivity is higher than that of the overall food and beverage industry (Table 13). While Canadian dairy processing labour productivity has increased at a faster rate than in the United States (Table 14), it is still below the U.S. productivity level.

**Table 13. Labour and Capital Productivity: Dairy Vs Food and Beverage in Canada**

	Food and Beverage	Dairy	Fluid Milk	Other Dairy
Labour productivity (manuf. v.a. \$K1986/person hrs), 1992	46.39	59.96	58.47	61.20
Growth (annual % change), 1983-1992	1.7%	2.7%	1.5%	3.7%
Capital productivity (manuf. v.a. \$'000k 1986 plant), 1992	4,514	5,948	5,827	6,048
Growth (annual % change), 1983-1992	3.2%	7.2%	4.9%	9.2%

Source: Based on Statistics Canada.

**Table 14. Labour Productivity in the Dairy Industries, Canada and United States**

	Canada	United States
	(annual % change)	
Labour productivity - growth 1982/3-1992 (manuf.v.a.\$ current/person hours)	7.3%	5.7%
Labour productivity - value in 1992 (manuf.v.a. \$Can./person hours)	72.73	90.20

Source: Based on Statistics Canada, U.S. Bureau of Census.

Compared with the United States, the gap in labour productivity is higher in the fluid milk than in the other dairy products industry, as shown below for 1992:<sup>9</sup>

- fluid milk industry:
  - 93.25 \$Can/person hour in the United States
  - 70.93 \$Can/person hour in Canada
- other dairy products industry:
  - 88.29 \$Can/person hour in the United States
  - 74.24 \$Can/person hour in Canada.

**Economies of Scale and Capacity Utilization.** Scale of operations and plant capacity utilization rates can affect costs. Various studies have identified potential economies of scale across a number of processed fluid and industrial dairy product categories (ISTC, 1991b; Rude, 1992).

While Canada has a number of world scale capable dairy processing plants under existing technology (ISTC, 1991b), most plants tend to be smaller than those in the United States. The United States has 6 times the number of dairy processing plants as Canada, but processes 9 times the dairy products on a milk equivalent basis (Price Waterhouse, 1991a).

Canadian dairy processing plant capacity utilization rates are lower than those in the United States across all industry segments, except ice cream and frozen desserts (Table 15). Additional costs associated with such excess capacity problems impact adversely the overall cost competitiveness of Canadian dairy processing firms in the various industry segments concerned.

**Profitability.** Dairy processing industry profitability is generally higher than that of the food processing industry as a whole (Table 16).

**Table 15. Profitability Indicators in the Dairy and Food Industries in Canada**

Profitability Indicators	Dairy Industry	Food Industry
Return on Capital Employed (1987)	19.3%	13.3%
Return on Equity (1987)	14.9%	14.6%
Profits (after tax) as % of Income (1990)	2.7%	3.3%

Source: Jelliss (1995)

<sup>9</sup> It should be noted that these productivity comparisons are affected by the exchange rate between the two countries.

In 1987, the dairy processing industry earned the highest return on capital employed among all the food processing industries. It also ranked fourth among the food sectors, both in terms of return on equity and in terms of profits as a percent of income.

**Price Trends.** Prices paid to milk producers have grown at a faster pace than prices for aggregate agricultural products. This has been reflected in the prices that processors charged for their products. However, the extensive price differentiation for milk at the producer level, has not led to a faster increase of prices at the consumer level, compared to the price index for all foods (Table 16).

**Table 16. Prices and Trends in the Canadian Dairy and Food Systems, 1981-1993**

Index 1986=100	Farm Product Price Index		Industrial Product Price Index		Consumer Price Index	
	All Agriculture	Dairy Products	All Food	Dairy Products	All Food	Dairy Products
	1981	107.1	85.4	84.2	75.1	78.9
1986	100.0	100.0	100.0	100.0	100.0	100.0
1993	106.4	117.1	116	123	122.8	116.9

Source: Statistics Canada.

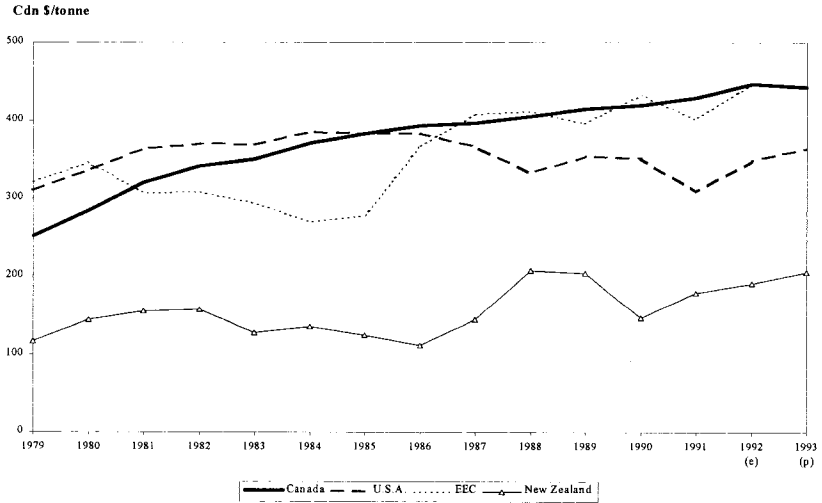
Prices in the dairy processing industry have increased at a faster pace than in the food industry since 1981. Fluid milk product prices have increased at a faster pace than prices for industrial milk products.

Relative to other major producing countries, prices for dairy products in Canada are generally higher (Figure 13). Compared with the United States, Canadian dairy prices are higher at all levels from farmers to consumers, and have increased at a faster rate (Figure 14).

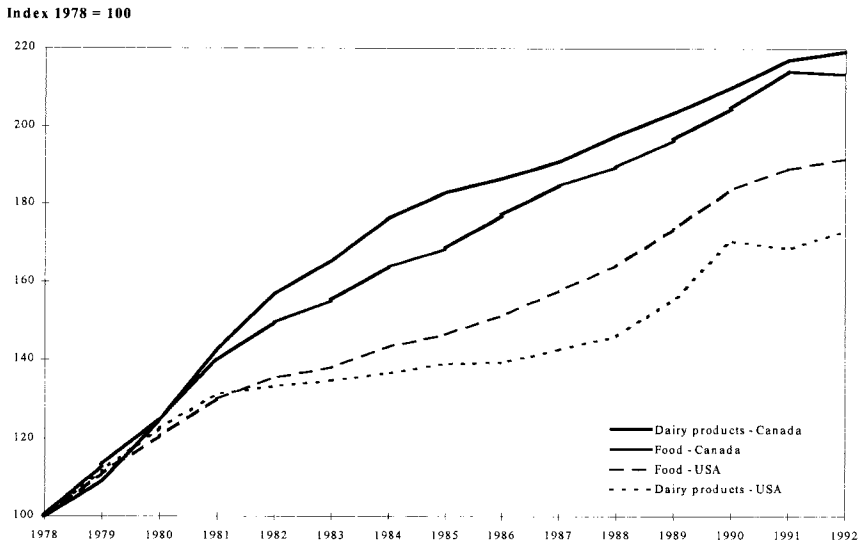
## CANADIAN DAIRY POLICIES

This section first examines the evolution of dairy policy, and then describes the background behind the development of the current supply management system and related sectoral policies.

**Figure 13. Farm Gate Milk Price for Canada and Selected Countries, 1979-1993**



**Figure 14. Consumer Price Indices for All Food and All Dairy Products Canada and United States, 1978-1992**





## **Evolution of Canadian Dairy Policies**

Many agricultural programs and institutions introduced in reaction to major economic disruptions, such as depression and war, have become entrenched as features of long-standing agricultural policy. These tendencies are evident in Canadian dairy policy and institutions (Veeman, 1987).

In Canada, the federal government appointed the first Dominion Dairy Commissioner in 1890. Prior to World War I, Canada was a major exporter of cheese and butter to the United Kingdom. In 1935, a temporary subsidy on butter and cheese was introduced. During World War II, federal subsidies were paid to dairy farmers to maintain production levels under a system of wartime price controls. Postwar assistance for industrial milk products, initially intended to be transitional, included programs to support prices, to export surplus products and to restrict imports. These programs, administered by the Agricultural Prices Support Board, subsequently were extended and administered by the Agricultural Stabilization Board established in 1958. In 1963, the lack of coordination between federal and provincial policies and the absence of effective mechanisms to control milk production led to a Canadian Dairy Conference. In 1965, a milk marketing board was established in the key Ontario market. In 1967, establishment of the Canadian Dairy Commission (CDC) under the Canadian Dairy Commission Act provided a federal body to develop initiatives in management of milk supply in cooperation with the provinces and provided the legislative basis for the implementation of supply management of industrial milk and cream. Supply management for fluid milk was enabled under the existing Agricultural Products Marketing Act (1957) which allowed provinces to control the fluid milk market. The National Milk Marketing Plan approach to managing the dairy market was adopted at the end of 1970. Dairy programs formerly under the Agricultural Stabilization Board are currently administered by the CDC (Grant, 1991 and Veeman, 1987).

Most marketing boards date from the 1930s when they were established under provincial legislation. The use of marketing boards in Canada as an effective means of major income transfers to farmers mainly dates from the 1960s and 1970s, in particular, the supply restricting boards. The evolution of marketing boards in Canada reflects the dual jurisdiction (federal and provincial) over agriculture and marketing. The general lack of jurisdictional conflict over the establishment of the various provincial fluid milk boards reflected the perishable nature of fluid milk and the localized nature of regulated markets for this product (Veeman, 1987).

Dairy policy in Canada uses import limitations to support the sector, and combines the long-standing feature of direct subsidy payments on specified marketed quantities of milk, along with quota restraints on marketings by producers. The milk market sharing program, basic to this policy since the early 1970s, is embodied in an agreement between the federal and provincial governments and is administered by a committee composed of the Canadian Dairy Commission, the provincial milk boards, and government agencies (Veeman, 1987).

Structures to manage the dairy industry were put in place in Canada rather later than in other advanced industrial countries. This was partly due to the need to negotiate a national policy between the federal government and the provinces, but the Canadian policy can also be seen as a response to changed world market conditions created by the existence of dairy management systems elsewhere. The structures that exist to regulate milk marketing under provincial jurisdiction and under supply management are described in the Veeman and St. Louis and Barichello and Romaine papers which follow.

### **Sectoral Policies Affecting the Dairy Industry<sup>10</sup>**

**Technical Regulations.** A variety of provincial and federal government health and safety, labelling, and compositional standards, and grading and environmental rules and regulations apply to the Canadian dairy products industry at both the farm and processing plant levels.

Provincial governments undertake milk testing on the farm, and monitor products for quality and safety in provincially registered milk processing plants. The federal government carries out similar inspection activities in the federally registered processing plants that process industrial milk into manufactured dairy products entering interprovincial and international trade.

The Federal government and some provincial governments also test and monitor dairy products at the retail level to ensure consumer safety through a variety of packaging, labelling, composition, weight, and sanitation controls.

**Research and Development.** The research component of combined federal, provincial and industry expenditures approached \$130 million in 1991-1992, representing approximately 1.7 percent of the value of dairy products industry shipments in 1991. If cost-of-production studies and milk recording programs are added, the total approaches \$164 million; or slightly less than 2.2 percent of shipments value. Technology transfer activities entail just over \$17 million in outlays; or less than one-quarter of one percent of shipments value. Of the total outlays identified, the combined federal and provincial government share amounted to an estimated \$55.4 million, 31 percent of the total, and the private sector share to approximately \$126 million, 69 percent of the total.

Government contributions to dairy industry research and development involve both the conduct and support of basic and applied research in government, university, and private institutions. Agriculture and Agri-Food Canada operates a network of research stations addressing various aspects of dairy cattle production. These include genetics, embryo manipulation, animal welfare, and food safety. Federal and provincial governments also contribute to the funding of university-based dairy research at the eight universities having dairy programs within their faculties of Agriculture.

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<sup>10</sup> Based on Jelliss (1995).

## Recent Policy Changes<sup>11</sup>

**Reduction In Direct Subsidy.** Up until 1988, the federal government paid dairy farmers a direct subsidy for industrial milk produced within domestic requirements. From 1988 to 1989, the direct subsidy was paid on actual domestic requirements plus the export sleeve. Since 1989, the direct subsidy has been paid only on actual domestic requirements.

In 1992, this direct subsidy was \$6.03/hl. Beginning August 1993, the federal government lowered the subsidy by 60 cents to \$5.43/hl. On August 1, 1993, the CDC announced that they would fully support the target price by raising the support price for skim milk powder. In effect, consumers would be charged a higher price to offset the drop in the dairy subsidy.

The effect of these changes has been to reduce the total amount of subsidy paid from approximately \$270 million (pre-1988) to \$225 million in 1994. It has been estimated that, as a result of this reduction as implemented by the CDC, there is no great effect on production or consumption. The skim milk powder support price increases, the butter support price remains constant, and cheese and other dairy product prices rise slightly due to the increase in industrial milk price to processors. Due to these higher product prices, there is a slight reduction in consumption of skim milk powder, cheese and other dairy products, a small increase in butter consumption due to substitution effects, and a net small reduction in domestic requirement for industrial milk leading to a small decrease in MSQ.

The 1995 federal budget announced a 30 percent reduction in the direct subsidy over the next two years (i.e., to \$4.62/hl in 1995 and to \$3.80/hl in 1996). As a result, the value of the subsidy will fall to \$160 million by 1996. The future of this remaining subsidy amount will be further considered over the next year, with the intent of identifying alternative uses for, and/or additional reduction in, these funds. The 1996 federal budget announced that the dairy subsidy will be phased out entirely over the next several years.

**Crossloading Butter And Skim Milk Powder Prices.** Historically, target price increases were shared evenly by butter and skim milk powder support prices. On August 1, 1991, the CDC started to shift the relative weights so that skim milk powder support prices increased more than butter. This was extended and expanded on August 1, 1993 when the CDC announced that it would reduce the butter support price and maintain the target price by increasing skim milk powder support prices. The effect of this crossloading is an increase in butter demand and a reduction in skim milk powder demand. Overall, MSQ (in butterfat equivalents) is still dropping with declining domestic demand, but the rate of decline is less under this scenario. This move seems appropriate given that demand for butterfat is declining relative to solids non-fat.

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<sup>11</sup> Based on Ewing (1994).

**Multiple Component Pricing.** Multiple Component Pricing (MCP) is an approach that permits all components of milk to be measured and valued to reflect market demands. Since 1992, four provinces have introduced multiple component pricing for industrial milk (Ontario, Quebec, Manitoba and New Brunswick). Initial component prices for butterfat, protein and other solids were selected such that overall returns for milk of average composition was unchanged. Multiple component pricing is not expected to have a large immediate impact on returns or milk supplies. Depending on the relative prices set, MCP could have a long-run impact on the composition of milk produced in Canada. If component prices are set with market demands in mind then pricing and resulting milk allocation and processed product mix will move toward a more market responsive pattern. If component prices are set with an eye to maintaining producer revenues then such allocative efficiencies may not be achieved.

**Change In The Basis For Applying Levies.** Levies are collected by provincial boards or agencies and forwarded to the CDC. Three types of levies have been charged to dairy producers in recent years: the in-quota levy, a fluid skim-off levy, and the over-quota levy. The CDC uses levy revenue to finance exports of dairy products not required for domestic purposes. The levies are also used to finance special programs designed to increase domestic utilization of butterfat and skim milk powder.

The in-quota levy (\$3.40/hl in 1990) has traditionally been charged on all industrial milk produced within MSQ. The fluid skim-off levy has been charged on the volume of skim-off transferred from the fluid sector to the industrial sector. The over-quota levy (\$32.64/hl in 1990) is charged on all production over MSQ, and is set very high to discourage producers from delivering milk above their quota level.

The in-quota levy is now applied to both fluid and industrial milk production and the skim-off levy is dropped. A three year phase-in period began in 1991-92 when 55 percent of each province's in-quota levy requirements were from traditional MSQ in-quota levy plus fluid skim-off levy and 45 percent from a levy applied to all milk production. This ratio between the new and old methods increased to 75-25 percent in 1992-93 and to 100-0 percent in 1993-94.

This policy change moves the regulation of the fluid and industrial markets closer together. The fluid market is now a large contributor of skim-off cream to the industrial sector, as a result of the demand shift towards low-fat fluid products. This levy change equalizes the contribution of each sector in financing demand enhancing programs.

The net effect seems likely to be a move towards a more integrated and more market responsive sector.

**Butterfat Utilization And Rebate Programs.** Two programs were introduced recently to address the declining demand for butterfat — the Butterfat Utilization Program (1991) and the Rebate Program for Further Processors (1992). Both programs are entirely industry funded.

The Butterfat Utilization Program pays a flat rate of \$2.00 per kilogram to processors such as bakeries and popcorn manufacturers who buy butter. It also compensates manufacturers of clarified butter (\$1.00/kg), ghee (\$1.50/kg) and fractionated butter (\$2.75/kg). In total, the program expended approximately \$6.4 million from June 1992 to May 1993. The support price of butter was about \$5.33/kg at the time and the world price was about \$1.90/kg.

The Rebate Program for Further Processors offered a rebate equivalent to 60 percent of the Canada-U.S. ingredient cost difference to processors who demonstrate actual or potential loss of market share to an imported product, due to higher ingredient costs. Spending on the program was \$3.2 million in 1991-92 and \$7.3 million in 1992-93. The program has been extended for three years and the rebate expanded to 85 percent of the cost differential.

The CDC credits these two programs with stimulating butterfat demand such that MSQ increased by 2 percent at the beginning of the 1993-94 dairy year, the first increase since 1988. This increase in demand was also aided by the lack of increases in butter support prices over the past two years.

***Single Quota For Fluid And Industrial Milk.*** Manitoba, Saskatchewan, New Brunswick and Ontario are currently using a single quota for fluid and industrial milk. Many other provinces are considering changing to a single quota system. The implications of such changes include:

- simpler administration.
- all producers receive the same price for their milk -- essentially a means of sharing access to all market uses equally among all producers.
- skim-off is no longer a fluid vs. industrial issue but one that all milk producers must face. This presumably will enhance intra-industry cooperation and coordination.
- easier movement towards a national system of supply control in Canada. (The next stage would be a single national market for quota.)
- no major effects on aggregate quantities and prices but there could be significant individual impacts on producers who did not have a 50/50 split between fluid and industrial quota, which includes most producers. The impact could be positive or negative depending on whether industrial or fluid quota was the bigger share of an individual's production. How the change is implemented and compensated for in each province will affect the magnitude of these effects.

## SUMMARY

The milk and dairy products industry ranks among the major industries in the Canadian agri-food sector in terms of farm cash receipts, processed product shipments, employment, value-added and industry contribution to gross domestic product. It has

operated within an extensively regulated policy environment. The federal government supports the target price through two programs: a direct subsidy to industrial milk producers, and intervention purchasing of surplus butter and skim milk powder. Fluid milk pricing is under provincial jurisdiction and is based on provincial cost-of-production formulas, the national industrial milk target price, and end-use. Government policies in areas such as dairy food safety and quality regulations, as well as research and technology development activities contribute positively to both cost and product competitiveness.

Supply management is the key policy affecting the Canadian dairy industry. It uses a combination of production and marketing controls (production quotas), import controls (tariff rate quotas) and administered pricing (based on cost-of production) to stabilize and support farm income in the dairy sector. The supply management system for dairy has successfully achieved most of its initial objectives; for instance, regional production capacity has been maintained, the vast majority of dairy farms are family owned and operated, farm family incomes in the dairy industry exceed the average family income of all other farm types (except poultry) and are higher than the average Canadian family income. However, certain elements of the supply management system, while upholding the objectives of the system, have imposed a number of inflexibilities tending to constrain adjustments to more competitive forms of industry organization.

While supply management contributed stability to the industry and has resulted in high returns to producers and processors, it reduced incentives for growth, prevented efficient reallocation of production and processing among regions, and added to the cost of rationalization within regions. It restricted the size and raised the costs of dairy farms and processing plants. Canadian milk production costs are noticeably above those of the United States and the Netherlands, more than double those of Ireland, and more than three times those of low cost producers such as New Zealand.

The overall Canadian market is relatively small and, to a degree, fragmented by interprovincial trade barriers, which can affect the ability of the industry to achieve economies of scale and improved levels of capacity utilization.

Sector structure, linkages and strategies also exhibit a number of positive and negative characteristics. The potential for additional economies of scale and enhanced levels of both technical and allocative efficiency appear to exist in raw milk production.

In dairy products processing, similar opportunities for economies of scale and technical efficiency improvements are in evidence, while reported plant capacity utilization rates in Canada are below those in the United States. Some larger firms and plants may be competitive with certain of their U.S. counterparts, and some firms have had success in developing export markets for higher valued products. However, the largely domestic and regional focus of the industry has provided relatively limited opportunities for participation in more dynamic markets elsewhere, and the development of expertise in the international production, marketing, sales, and distribution skills characteristic of more internationally oriented competitors.

Various factors, including dairy policies and institutions, have contributed to the domestic orientation of the industry, constrained structural adjustment, and influenced the way firms compete.

While the dairy industry clearly faces competitive challenges, a number of strengths appear to exist and a number of opportunities for improvements can be identified. In particular, there exist strengths in the areas of genetics and dairy stock breeding, as well as in many of the regulations governing product safety and quality. Opportunities exist to improve management practices and technical efficiency at both the dairy farm and dairy products processing levels. Modifications to the operation of the supply management system, along with appropriate investments in the process, product, and marketing developments are required to facilitate movement into higher-value dairy product market segments. Raw milk cost disadvantages are likely to be relatively less important and offer areas of potential improvement. It will be important to ensure that current industry stakeholder initiatives in these areas are continued, and that policies at other levels and in other areas of the economy play a supportive role.

Neither the CUSTA, the NAFTA nor the Uruguay Round GATT agreements have significantly affected the import protection afforded the Canadian dairy industry. Recent policy discussions have focused on relatively modest adjustments to existing policies to make them compatible with the GATT/WTO rules.

The major pressures for change are the consumer preference for low-fat products and the global trend toward more liberal trading environments. Gradual adjustment to the new trading regime is the preferred course of action in Canada. Sudden and complete deregulation of the dairy sector is not desirable politically, socially or economically.

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