# ECONOMIC IMPACT OF THE DAIRY COMMISSION ON THE PRIMARY SECTOR OF THE NOVA SCOTIA DAIRY INDUSTRY

by

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# TABLE OF CONTENTS

Chapter

Page

# LIST OF TABLES

Table Page

Chapter 4



Appendix

# LIST OF FIGURES

## ABSTRACT

This thesis deals with the structure and performance of the primary sector of the dairy industry in Nova Scotia. While the history of the operation and management of dairying from its early beginnings is outlined, the main concern is with the management and regulation which has evolved for the industry since the creation of the Nova Scotia Dairy Commission in 1967. The aim of the thesis is to evaluate the regulation of the Dairy Commission in terms of its effect on producer and consumer milk prices, returns to the producers, and economic efficiency at the primary level of production.

The findings of the study indicate that from a structural aspect there has been a significant reduction in the number of primary producers over the last two decades. In addition, the Nova Scotia Dairy Commission has generally been successful in stabilizing and raising the prices that producers receive. Through supply management and pricing policies it has effected an increase and a degree of stability in producers' incomes. In terms of fluid milk prices as they pertain to consumers, the evidence indicates that this was a secondary goal and that prices were in excess of that which would be derived from a competitive model.

# INTRODUCTION

This study concerns the dairy industry, which for several decades has been an important part of the agricultural sector in Nova Scotia, with management practices existing in the form of price and supply regulations.

Briefly, the approach followed in this study was to evaluate the overall performance in this industry by examination of the rate of return to producers at the primary level through the price-cost relationships and the demand-price relationships as pertaining to consumers. An overview of the structure and behaviour which have prevailed in the industry was undertaken, with the focus, however, on the recent period of the last 12 years, during which the industry has been under the control of the Nova Scotia Dairy Commission.

This study was carried out in the following manner. In Chapter 1 the structure of the industry is discussed, taking into account such factors as location, the primary and secondary levels and unique features of the industry. Chapter 2 describes the regulatory aspects in the industry and reviews the 'tools' of marketing boards such as prices, pricing formula, and quotas.

Chapter 3 outlines the general economic theory of agricultural products with special reference to the dairy

industry, examines the criteria for the performance of a marketing agency and analyses the demand for fluid milk in Nova Scotia by regression analysis. Chapter 4 examines the performance of the Nova Scotia dairy industry at the primary level in terms of pre- and post-marketing board era. In Chapter 5 conclusions are drawn as to the benefits (or losses) which can be attributed to the introduction of a marketing agency into the dairy industry.

It should also be mentioned that there is very little published literature available on the dairy industry of Nova Scotia, and thus it is hoped that this study will provide an informative summary as well as an economic evaluation on the industry.

# Chapter 1

## STRUCTURE OF THE INDUSTRY

## THE PRIMARY SECTOR

### Early Period to the 1930's

Over the past century the dairy industry in Nova Scotia developed from very small beginnings to a level of significance where the production of milk and dairy products have become the most important segment of agricultural activity in the province. At the beginning of the nineteenth century dairying involved little more than the hand milking of the family cow for home consumption of milk and home production of such dairy products as butter and cheese.

However by 1830 those mixed farms with a surplus of cows began transporting their hand-made butter to the larger towns of Halifax, Chester and Lunenburg. The increase in butter-making by the mid-decade was manifested by the fact that the designs of many butter churns were patented in the province. At the outset, butter was marketed in 25-or-more-pound barrels made by Micmacs, but later in one-half or one pound blocks or balls wrapped in paper bearing the unique design of the maker.

After 1850 farmers began to cooperate in both the making and selling of butter. Farmers in a local area would

choose a representative to gather market information and ascertain the total requirement for their product in neighbouring towns. Following distribution of the orders among the farmers, the representative would collect the product and arrange for its transportation to the consuming group. Later, as capital equipment became too expensive for the individual butter-maker, farmers began to operate creameries on a corporate level. Thus cooperative associations had their beginning in Nova Scotia.

Between 1906 and 1929 the number of creameries competing to produce and sell butter and ice cream in Nova Scotia increased from 17 to 29.[1] The expansion in this sector, as well as other sectors of the dairy industry, was due to a variety of factors, including the extension of the cooperative principle, the aggressiveness of private organizations, the improvement of roads and the use of motor trucks. In fact, in the 1920's and 1930's over-expansion emerged in the more favorable areas of the province, with delivery routes being duplicated and the costs of delivery increasing. It is to be noted that at this time the creameries exported sweet cream to the United States, and canned cream all over the world; but all the butter produced was sold in Nova Scotia, and represented one-half of the provincial demand for butter.

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[1] J. H. Jones, Report of the Royal Commission Provincial Economic Enquiry (Halifax: King's Printer, 1934).

A considerable amount of cheese was also made on Nova Scotia farms in the early period, with the first cheese factory being erected in Paradise, Annapolis County, in 1870, and the second in Onslow the following year. However, the cheese produced was not of the highest quality and had a limited market. By 1929 only one cheese factory, the Malagash Cheese Factory, was in operation being run by the Department of Natural Resources, but it was soon closed. Thereafter, cheese remained a secondary product of creameries and multi-product dairy factories in the province, until 1966 when the Twin Cities Co-operative Dairy Limited opened a cheese plant, Producers Milk Products Limited, in Salmon River, Colchester County.

Prior to 1900 the market for fresh milk in Nova Scotia was also limited, with less than 10 percent of milk production being sold as fluid milk. After 1900, with the rise of industrialization, fresh milk in metal cans began to be shipped in much greater quantity to the urban areas, where it was pasteurized and distributed by dairies, and ultimately became the most significant product of the industry.

It was during the first three decades of the twentieth century that the dairy industry, and especially the fluid milk sector, experiencedits take-off. The creation of an increasingly large industrial population in Nova Scotia brought with it a larger market for dairy products, and the industry responded with increases in milk production and in the number of processing plants operating to produce and

deliver dairy products in the province. At the same time, the improvement of transportation all across Canada increased competition for markets and forced Nova Scotia milk producers to specialize and become more efficient. Larger dairy enterprises with modern equipment thus began to emerge in the more favorable farming areas of the province.

However, the occurrence of high beef prices in the late 1920's induced many farmers either to sell milking cows for slaughter or breed them with beef sires. The resultant decrease in number and lowered quality of milking cows reduced the provincial level of milk output. This led to greater emphasis on increased productivity in terms of milk output per cow and motivated many of the farmers who were already operating on a large scale to expand and specialize even further to take up the slack in the industry. Nevertheless, by 1930 growth in the industry had slowed down, and an improved marketing organization was to become the next important means to attain future growth.

Recent Period - 1930's to 1970's

Despite the decrease in total production, there has been a steady increase in production per cow over the past decades, from a yearly average of 3,400 pounds per cow in 1921 to 9,200 pounds in 1976. These figures are an understatement, as they include small non-market-oriented farms

having low-producing cows which could not be truly classified among Nova Scotia milk producers. On the economically-sized farms, with over 60 cows being milked, the present average yearly milk production is about 13,000 pounds per cow. Normally, good cows will give over 16,000 pounds of milk per year. The most productive cow in Eastern Canada in 1976, found in Berwick, Nova Scotia, produced 28,000 pounds that year.[2]

The trend in the number of cows and total milk production in the province has been downward over the past decades. Between 1941 and 1976 the dairy cow population has declined about 63 percent and milk production 24 percent, although productivity has more than doubled (Table 1).

Also at the primary level, there has been a corresponding decrease in the number of farms and farm operators reporting any number of milking cows, from a total of 19,251 farms in 1951 to 1,999 in 1976 (Table 2). Many of these farms are today too small to economically operate as dairy farms. As the divisions from the key to Table 2 indicate, almost none with fewer than 20 cows being milked ship to processors; and a minimum of about 30 milking cows is needed on a strictly dairy-oriented farm to support one man and his family. A further breakdown showing only fluid milk producers for the year 1966 can be observed from Table 3.

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[2]Personal correspondence with dairy farmers.

Table 1

Total Milk Production, Number of Cows on Dairy Farms and Average Milk Output per Cow in Nova Scotia

| Year | Total milk production ('000 pounds) | Number of cows on census farms at June 1 ('000 head) | Average output per cow (pounds) |
|---|---|---|---|
| 1921 | 488,321 | 119.2 | 3,400 |
| 1922 | 505,308 | | |
| 1924 | 528,980 | | |
| 1926 | 480,629 | 114.5 | |
| 1931 | 437,030 | 108.0 | 4,000 |
| 1936 | 433,093 | 111.2 | |
| 1941 | 447,338 | 108.1 | 4,100 |
| 1946 | 463,743 | 94.8 | |
| 1951 | 399,821 | 80.2 | 5,100 |
| 1956 | 460,241 | 82.8 | |
| 1961 | 384,595 | 66.0 | 6,000 |
| 1966 | 341,195 | 50.0 | |
| 1971 | 339,735 | 41.2 | 7,900 |
| 1976 | 353,961 | 38.6 | 9,200 |

Sources:

Column 2: Nova Scotia Department of Agriculture and Marketing, Agricultural Statistics, 1975.

Column 3: Statistics Canada, Handbook of Agricultural Statistics, Dairy Statistics, Part VII.

Column 4: Report of the Nova Scotia Milk Industry Inquiry Committee 1966-1967; also calculated from the first two columns of the Table.

Table 2

Farms Reporting Milk Cows by Herd Size, Nova Scotia

| Number of cows | 1951 | 1956 | 1961 | 1966 | 1971 | 1976 |
|---|---|---|---|---|---|---|
| 1 | 5,125 | 4,183 | 1,745 | 1,172 | 582 | |
| 2 | 4,266 | 3,359 | 1,676 | 954 | 377 | 1,077 |
| 3- 7 | 7,140 | 5,774 | 3,451 | 1,843 | 733 | |
| 8-12 | 1,819 | 1,847 | 1,274 | 794 | 340 | 138 |
| 13-17 | 555 | 793 | 645 | 424 | 200 | 79 |
| 18-32 | 308 | 579 | 684 | 663 | 399 | 266 |
| 33-47 | 29 | 72 | 100 | 186 | 212 | 195 |
| 48-62 | 6 | 12 | 28 | 44 | 86 | 105 |
| 63-77 | | | | | 46 | 60 |
| 78-92 | 3 | 4 | 8 | 24 | 14 | 26 |
| 93+ | | | | | 26 | 53 |
| Total | 19,251 | 16,623 | 9,611 | 6,104 | 3,015 | 1,999 |

Source:

Statistics Canada, Handbook of Agricultural Statistics, Dairy Statistics, Part VII.

Key:

_ _ _ _ is the border between shippers to processors and nonmarket-oriented milk producers.

——— is the border between economically efficient- and inefficient-sized farms.

Table 3

Number of Fluid Milk Producers by Herd Size, Nova Scotia, 1966

| Number of cows | Number of producers |
|---|---|
| 1-10 | 362[a] |
| 11-20 | 719 |
| 21-30 | 379 |
| 31-40 | 103 |
| 41-50 | 30 |
| 51+ | 27 |
| Total | 1,620 |

Source:

Report of the Nova Scotia Milk Industry Inquiry Committee, 1966-1967.

[a]Most farms in this interval have between 7 and 10 cows.

The Nova Scotia Department of Agriculture and Marketing thus does not recognize any farm with less than 20 cows as a dairy enterprise, of which there were about 700 in 1976. Within this group, only enterprises with over 60 cows were found by various studies to have returns from milk sales covering the costs of production.[3] Over the last decades the number of dairy farms that have disappeared have been predominantly the small farms. With a growing concentration of large herds in the hands of fewer farm owners, the structure of the industry has changed.

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[3]Nova Scotia Department of Agriculture and Marketing, Nova Scotia Dairy Farm Business Analysis Report, 1976.

Today the dairy industry is the largest sector of agricultural activity in Nova Scotia. Sales of dairy products presently account for 33 percent of farm cash receipts in the province.[4] The importance of the dairy industry to the agricultural sector of Nova Scotia is greater than that prevailing for Canada in general. However, the relative importance of the dairy industry varies considerably from area to area within the province. The industry is concentrated in two areas, the Annapolis Valley and the Stewiacke area. Colchester, Hants and Kings Counties have by far the most cows and highest milk production of all the counties.[5] The four greatest producing counties produce 60 percent of the milk for the province, while the four smallest produce less than one percent

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[4]Department of Agriculture and Marketing, Agricultural Statistics, Vol. 12, 1977, Halifax, pp. 10-11.

[5]The weak position of the industry in Eastern Nova Scotia is attributable to several factors. The land is rugged and rocky and weather conditions are unpredictable, making the east less suitable for pasturing and grain-growing than the west. Old-fashioned farm methods, lack of adaptability by the people to modern dairying practices and the lack of agricultural education, with all the educational agencies such as the Agricultural College, Experimental Farms and government agencies being first esablished in the west, make the industry there less prosperous than in other parts of Nova Scotia. Dairying in the east is based on uneconomical, small-farm operations that sell milk mainly for production into butter at low producer prices, and are slowly dying out.

thereof. The leading counties tend to have the most efficient farms, having a greater number of cows per farm and greater productivity per cow.[6] It is these areas that are expected in the near future to become even more prominent as producers in Nova Scotia.

## THE SECONDARY SECTOR

We now turn to review the structure of the secondary sector of the dairy industry. This is made up of several different types of plants producing various dairy products. The plants can be classified as follows: 1) pasteurizing plants, which treat and sell fluid milk to the public, either directly through home deliveries or indirectly through supplying retail grocery stores, 2) creameries, which manufacture cream into butter and in some cases, cheese, and 3) multi-product plants which produce milk powder, cheese, frozen desserts and other milk by-products. In this study, these plants will be referred to as the milk processors or the processor-distributors in order to differentiate them from the farmers, who are the milk producers and shippers.

Milk can be classified, depending on its marketing use, into several categories: 1) fluid milk, which is that

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[6] See Appendix, Table 1.

milk sold to pasteurizing plants to be used as drinking milk, and 2) manufacturing or industrial milk, which is used by plants to manufacture secondary products. Fluid milk is called Class I milk, while manufacturing milk is subdivided into Classes II, III, and IV when used for making cottage cheese and ice cream, cheddar cheese and skim milk powder, and butter, respectively. About two-thirds of the milk produced in Nova Scotia is currently used as fluid milk, and the remainder as manufacturing milk. The present form of consumption has changed drastically since 1920, when only 14 percent of milk produced in Nova Scotia was for fluid milk sales (see Table 4).

Table 4

Fluid Milk as a Percentage of Total Milk Production in Nova Scotia for Selected Years, 1921-1976

| Year | Fluid Sales (%) | Year | Fluid Sales (%) |
|---|---|---|---|
| 1921 | 14.0 | 1956 | 46.0 |
| 1926 | 14.0 | 1961 | 52.1 |
| 1931 | 20.1 | 1966 | 57.2 |
| 1936 | 20.7 | 1971 | 62.2 |
| 1941 | 25.8 | 1975 | 64.7 |
| 1946 | 35.0 | 1976 | 62.1 |
| 1951 | 37.8 | | |

Source:

Statistics Canada, Handbook of Agricultural Statistics, Part VII; also Department of Agriculture and Marketing, Agricultural Statistics, Publ. 100.

Between 1941 and 1951 fluid milk sales increased significantly rising from 20.8 percent to 38.7 percent of total milk production (see Table 5). This trend of fluid milk use has continued and in 1976 fluid milk sales accounted for 62.1 percent of the total utilization of milk. This development indicates that the production of manufacturing milk in Nova Scotia has become a by-product of fluid milk operations. Currently, producers opting to increase their herd size do so with the expectation of securing a large fluid milk contract from one of the processors.

Over the past two decades the number of processing plants has decreased steadily. While in 1958 there were 52 of these establishments, in 1978 there were only 18, as shown in Table 6. This steady decrease reflects the response to over-expansion in the sector during the early 1900's and the pressure on small-scale manufacturers. Because of the low price for cream offered to the typically small, high-cost cream shipper the number of cream shippers and, hence, butter manufacturing plants, has declined. Creameries which manufacture only butter have not been able to survive in the processing sector, as evidence by the fact that no such establishment exists today whereas there were 11 in 1965.

In contrast to the sharp decline in the number of establishments, the employment levels in the processing

Table 5

Utilization of Whole Milk in Nova Scotia for Selected Years ('000 pounds)

| Utilization | 1941 | 1951 | 1956 | 1961 | 1966 | 1971 | 1976 |
|---|---|---|---|---|---|---|---|
| Creamery butter | | | | | 67,087 | 45,724 | 28,922 |
| Other factory products | | | | | 44,142 | 62,278 | 86,153 |
| Total factory products | 172,367 | 156,800 | 169,211 | 130,279 | 111,229 | 108,002 | 115,075 |
| Dairy butter (made on farms) | 137,781 | 32,989 | 16,096 | 7,979 | 2,878 | 2,106 | -- |
| Fluid milk | 96,810 | 51,246 | 181,955 | 200,528 | 198,696 | 211,270 | 219,680 |
| Farm home consumed | 44,686 | 44,610 | 45,937 | 28,297 | 23,010 | 18,150 | 8,691 |
| Livestock feed | 14,735 | 14,176 | 17,391 | 17,512 | 10,151 | 9,253 | 10,515 |
| Total | 466,379 | 399,821 | 430,590 | 384,595 | 345,964 | 348,781 | 353,961 |
| | Utilization as Percentage of Total | | | | | | |
| Creamery butter | | | | | 19.4 | 13.1 | 8.2 |
| Other factory products | | | | | 12.8 | 17.9 | 24.3 |
| Total factory products | 37.0 | 37.8 | 39.3 | 33.9 | 32.2 | 31.0 | 32.5 |
| Dairy butter | 29.5 | 8.5 | 3.7 | 2.1 | 0.8 | 0.6 | -- |
| Fluid milk | 20.8 | 38.7 | 42.3 | 52.1 | 57.4 | 60.6 | 62.1 |
| Farm home consumed | 9.6 | 11.2 | 10.7 | 7.4 | 6.7 | 5.2 | 2.5 |
| Livestock feed | 3.1 | 3.8 | 4.0 | 4.5 | 2.9 | 2.7 | 3.0 |

Source:

Report of the Nova Scotia Milk Industry Inquiry Committee, 1966-1967; Department of Agriculture and Marketing, Agricultural Statistics, Province of Nova Scotia, various volumes, Halifax, Nova Scotia.

Table 6

Number of Dairy Factories and Employment in Nova Scotia

| Year | Number of Factories | Employment[a] |
|---|---|---|
| 1906 | 17 | |
| 1916 | 21 | |
| 1926 | 27 | |
| 1933 | 30 | |
| 1957 | 51 | 1,136 |
| 1958 | 52 | 1,174 |
| 1959 | 50 | 1,199 |
| 1960 | | 1,120 |
| 1961 | | |
| 1962 | 48 | 1,356 |
| 1963 | 44 | 1,267 |
| 1964 | 43 | 1,287 |
| 1965 | 37 | 1,329 |
| 1966 | 37 | 1,444 |
| 1967 | 35 | 1,434 |
| 1968 | 32 | 1,406 |
| 1969 | 30 | 1,455 |
| 1970 | 29 | 1,500 |
| 1971 | 30 | 1,489 |
| 1972 | 25 | 1,408 |
| 1973 | 24 | 1,248 |
| 1974 | 18 | 1,443 |
| 1978 | 18 | 1,019 |

Source:

Statistics Canada, Dairy Factories and Dairy Products Industry, various issues.

J. H. Jones, Report of the Royal Commission Provincial Economic Enquiry (Halifax: King's Printer, 1934).

[a]Includes production, sales and delivery.

sector have remained fairly constant (see Table 6). Employees in the industry can be classified into two groups: 1) those employed in the production processes, and 2) those employed in sales and delivery of finished milk products. The proportion of employees in each group has changed considerably over time. In 1957, 64 percent of the industry's employees worked in production processes, but this sector accounted for only 36 percent in 1974, with a large proportionate increase in the sales and delivery sector.

The three largest establishments today are cooperatives (see Appendix, Table 2). Scotsburn Co-operative Services Limited, which also owns Brookfield Foods Limited, has seven plants serving central Nova Scotia, and exports milk products to other provinces of Canada and to foreign countries other than the United States. Twin Cities Co-operative Dairy Limited has three plants serving western Nova Scotia and exports to other Canadian provinces. Eastern Dairy Foods Co-operative Limited has three plants and serves eastern Nova Scotia, Cape Breton and also exports to other Canadian provinces. The remaining five establishments are small and privately-owned; four of which are companies, three Nova Scotia owned and one, Baxter Dairies Limited, New Brunswick owned. The remaining establishment, Peninsula Farm, is a single small farm selling home-made

dairy products, mainly yogurt. All five establishments serve small local Nova Scotia markets.

The number and size of the processing firms have been greatly affected by the development of the retail food chain stores as well as by changes in technology and the industrial structure. Creameries, ice cream plants, and especially dairies, which were typically small pasteurizing plants selling to local markets through home delivery routes, were faced with growing competition from retail chains, which offered consumers lower prices and a greater variety of products and container sizes. These factors, plus the high cost of pasteurizing and bottling, put pressure on dairies to expand their businesses or sell out to other distributors. The result has been increased concentration at the processing plant level in the ownership of a few large cooperatives, but relatively low profit ratios in the sector. The ultimate threat posed by the retail chains is that they could integrate back into the processing field, as done by Loblaws in Ontario and Safeway in the west. To offset this threat the larger dairy companies in Nova Scotia may be forced to enter the retail markets directly, in a manner similar to that already carried out by the counterparts in other provinces of Canada.

# Chapter 2

## REGULATORY ASPECTS IN THE NOVA SCOTIA DAIRY INDUSTRY

### CONDITIONS PRIOR TO CREATION OF THE NOVA SCOTIA DAIRY COMMISSION

Some degree of control of the Nova Scotia dairy industry by the government began in the 1930's. The justification for this action, rightly or wrongly, was asserted to be market conditions. At this time there were a large number of processor- and producer-distributors who were carrying out cut-throat competition for product markets. As a result there existed not only a wide range of prices for the various types of milk, but also a great deal of price instability. Worst of all, it was not unusual for producers not to receive payment from the processor for their milk shipments.

In 1939 under the Agriculture and Marketing Act, the Dairy Arbitration Commission was established and given power, among other things, to fix standards of fluid milk price in any area of the province. Various spheres of its power, however, required the direction or approval of the Governor-in-Council. This Commission was composed of an official from the Department of Agriculture, a representative of the producers and a disinterested citizen. Because of the major problem of producers in securing payment for

their shipments of milk, the Dairy Arbitration Commission found itself acting primarily to provide assurance of payment by processors to producers, with the administration of prices taking a secondary role.

In 1944 the Dairy Arbitration Commission was abolished by an act of the Nova Scotia legislature, and the authority to administer control over the dairy industry given, under Part XVII of the Agriculture and Marketing Act, to the Board of Commissioners of Public Utilities.[7] The powers given to the Board closely parallelled those given to the Dairy Arbitration Commission, but were somewhat enlarged, as they allowed the Board to act independently of the Governor-in-Council, and also gave it jurisdiction over dairy products such as butter, cheese, ice cream, condensed, evaporated and powdered milk through a redefinition of "milk". Some of the functions of the Board were: (a) to fix the price of milk producers received so as to assure an adequate milk supply, (b) to see that the processor received a reasonable return to his services, and (c) to see that the price to the consumer was reasonable. Although having these broad powers, up to 1966 the Board exercised its control only over producer, wholesale and

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[7] Report of the Nova Scotia Milk Industry Inquiry Committee, 1966-1967, p. 132.

consumer prices of fluid milk, cottage cheese and ice cream, permitting the prices of other dairy products to be determined in the market.

The effectiveness of the Board was hindered by several factors. In practice it adjusted prices only after a group of producers or processors made an application asking for a change in price. In failing to look into the industry's situation on its own initiative it left the industry void of strong leadership and preventative action. It was also greatly restricted in conducting an effective policy due to the lack of specific data on production and distribution costs in the industry. In addition, under the administration of the Board, the province was divided into controlled and uncontrolled areas; of these only the controlled areas, having met certain conditions, were allowed to benefit from its price regulation and protection. Thus the industry in the province was fragmented and areas treated unequally. Finally, the Board, having a wide range of other responsibilities within the province, could not devote the necessary time and attention required for the needs of the dairy industry.

These factors led the Island of Cape Breton and the counties of Antigonish and Guysborough in 1957 to withdraw from the authority of the Board of Commissioners of Public Utilities and set up the Cape Breton Milk

Marketing Board under the provisions of the Natural Products Marketing Act. The Cape Breton Milk Marketing Board's composition and authority with respect to pricing were similar to the composition and powers of the preceding Board. In practice the producers and distributors of milk in that area negotiated an acceptable price between themselves and submitted their request to the Cape Breton Milk Marketing Board, which always accepted and approved it. In all other aspects the industry was left free to govern itself.

While the milk producers and processors in the Cape Breton area were generally satisfied with the Cape Breton Milk Marketing Board's rule, a major problem arose--given the existence of a separate Board for such a small geographical area--namely the unavailability of outlets for milk produced in excess of local demand. The largest dairy in the area, the Cape Breton Dairymen's Co-operative, refused to accept milk in excess of the quota from its quota-holders, so as not to produce milk products in excess of demand. With the existence of few alternative dairy processing plants which would buy more milk, the producers in Cape Breton experienced great difficulty in disposing of production which exceeded the quota or to expand their enterprises. Furthermore, due to the high per-unit cost experienced by the small Cape Breton dairy farmers, milk prices tended to be higher than those in the rest of Nova

Scotia, thus promoting some degree of isolation and stagnation in the industry in this area.

Despite such problems the Nova Scotia dairy industry was relatively free from price wars, unfair trade practices and other disruptive situations such as occurred in other provinces during the years when control was vested in the two Boards.

## NOVA SCOTIA DAIRY COMMISSION

In the early 1960's the growing complexity of the industry brought a need for a new and more specialized mechanism of control. In May 1966 the Milk Industry Inquiry Committee was appointed by an Order-in-Council to inquire into all phases of the industry in Nova Scotia and make recommendations. After a year of research an interim report was made to the 1967 session of the legislature, recommending that a dairy commission be set up to regulate the entire provincial industry in the place of the Board of Commissioners of Public Utilities and the Cape Breton Milk Marketing Board.[8]

Accordingly, on June 1, 1967 the Nova Scotia Dairy Commission (N.S.D.C.) was established under Part XVIII of the Agriculture and Marketing Act. It was to consist of a

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[8] Report of the Nova Scotia Milk Industry Inquiry Committee, 1966-1967.

representative of the Nova Scotia Milk and Cream Producers Association, a representative of the processing sector, and three citizens unassociated with the industry, appointed by the Governor-in-Council for terms of five years on a staggered basis. The N.S.D.C. was given broad powers to settle disputes within the industry, set milk prices, control milk supply through regulating the quota systems in the province, and generally to regulate the transportation, selling and advertising of dairy products in Nova Scotia. In an effort to bring order and uniformity into the industry and guarantee the high quality thereof, it prescribed in what type of containers milk could be sold, provided for regular inspection of farms and plants, made the licensing of all producers and processors compulsory, and required the keeping of records on sales and returns by producers and processors.[9] This wide-ranging control granted to the N.S.D.C. has led to the modernization and strengthening of the position of the dairy industry in Nova Scotia agriculture over the past ten years; the development of which will be elaborated upon in a later chapter.

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[9]The Agriculture and Marketing Act, Part XVIII, as amended, 1968, The Distribution and Sale of Milk--Office Consolidation.

## QUOTAS

In conjunction with price control, the regulation of the supply of milk through the use of guotas has been one of the most important aspects of marketing agency activity in Nova Scotia. Veronica McCormick, a marketing economist with Agriculture Canada, defines a marketing quota as "the opportunity to a share of a particular market at a particular price."[10]

Some of the dairy industry's basic problems, which have given rise to demands for marketing agencies and quota systems, can best be described with the help of Figure 1, which shows the market demand and supply for fluid milk as a function of price. The demand for milk is assumed to be the same in summer ($D_1D_1$) as in winter ($D_2D_2$), since the demand for fluid milk is relatively stable throughout the year. But under free competition and in the absence of quotas, the supply of milk in the summer is greater than in the winter, mainly because of the availability in summer of low cost pasture for feed, and because farmers schedule calving for the spring and thus realize their greatest milk production in summer. This leads to high milk sales of $OQ_s$ and a low milk price $OP_s$ during the summer, and low sales of $OQ_w$ and a high

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[10] V. McCormick, "Milk Quotas: What Do They Mean," Canadian Farm Economics, VIII, 5 (October, 1973), 26.

price $OP_w$ in the winter. Average annual sales of milk $OQ^*$ and price $OP_a$, are derived from Figure 2, which shows the total annual supply and demand for fluid milk.

If a marketing agency were to enforce the average price $OP_a$ all year round in an effort to stabilize price without enforcing a quota system to stabilize supply, it would have to purchase $Q_s^a Q_s$ excess supply of milk during the summer and sell it in winter to meet the excess demand $Q_w Q_w^a$. In order to do this, fluid milk would have to be stored for about six months eachyear; which is impossible to do, as milk historically cannot be stored at any cost, and thus quotas are necessary.

With a quota system in operation, a marketing agency could enforce a price such as $OP_a$ by distributing the right amount of quota to bring forth the amount of milk $OQ_s^a$ in summer and $OQ_w^a$ in winter, with $OQ_s^a = OQ_w^a$. The winter requirement $OQ_w^a$ shows a need for more cows to supply that number of units, and results in supply curve $S_2'S_2'$ in winter and $S_1'S_1'$ in summer. The excess supply $Q_s^a Q_s^b$ of fluid milk produced in summer as a result of this increase in cow population is used as manufacturing milk and processed into dairy products that can be stored or transported to other places at minimal costs. $OP_1$ is the price producers receive for manufacturing milk in summer. The marketing agency's quota and pricing policy has resulted in stabilizing producer prices and incomes,

Figure 1

Seasonal Fluctuations in Milk Supply

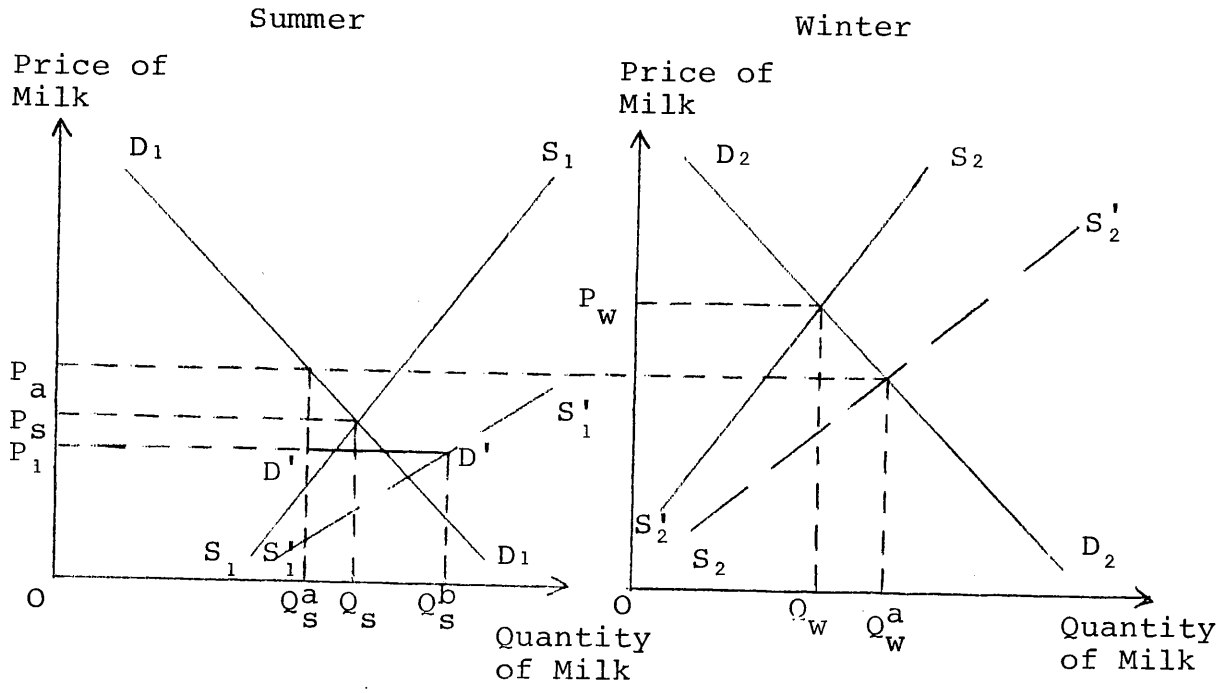
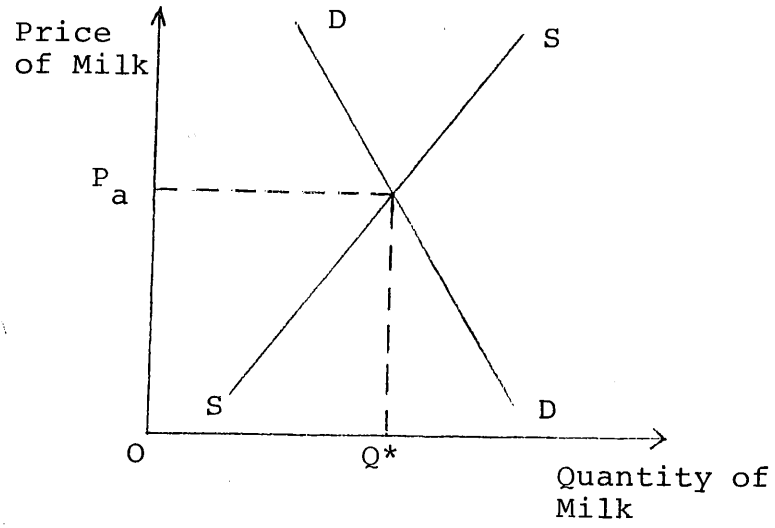



Figure 2

Stabilized Milk Supplies During Full Year




Source:

H. C. Grubel and R. W. Schwindt, The Real Cost of the B. C. Milk Board (Vancouver: The Fraser Institute, 1978), p. 7.

although there prevails a difference between fluid and manufacturing milk prices.

There are three types of quotas presently in force in the Nova Scotia dairy industry: 1) the provincial fluid milk quotas, 2) the federal subsidy eligibility quota, and 3) the federal Market-Sharing Quota.

Quotas for fluid milk production have existed in Nova Scotia since the 1930's. They were set up by individual milk processing plants in an attempt to quarantee that they received from the producers a sufficient and relatively stable daily supply of milk, and to level out the fluctuations between summer and winter production. Each processor would estimate the daily demand for milk in the market area that he served and then assign to each of his shippers a daily volume of milk to be shipped to him.

Since each individual processing plant had its own quota system, numerous inconsistencies appeared between quota systems within the province. For example, in one area quotas would be based upon the lowest three months of the processor's receipts, while in another are they would be based on the six months of the producer's lowest production. Furthermore, quotas in some areas would be frequently adjusted, while in other areas they would be very rigid, remaining unchanged for years and thus hindering expansion by producers.

With the establishment of the Nova Scotia Dairy Commission in 1967 a degree of uniformity in the quota systems of the province was brought about. To allow for growth in the producer sector, quotas were to be revised annually, on April 1, the beginning of the dairy year. Producers whose shipments were below their quota during the three months of lowest production were to be reduced in quota to the level of their shipments during these months. Producers who were above quota during three months would gain the quota lost by other shippers. Quotas could be purchased and sold, with all quota purchases and revisions administered by a quota committee which would be set up at each plant and comprised of the manager of that plant, two producers and a N.S.D.C. representative.

In general, the practice has been for the processors, especially those operating multi-product plants, to require their suppliers (producers) to ship not only their fluid milk quota, but also an additional 10-20 percent in order to guarantee a sufficient supply of milk for manufacturing purposes and to meet any unforeseen surge in demand. Farmers who produce more milk than this 110-120 percent-of-quota volume must feed the excess milk to their livestock, or try to find some other processor who will buy it.

On average, 83.3 percent of the producer's fluid milk quota is actually sold in the market as fluid milk.

For this part of his quota the producer receives the fluid milk or Class I price set by the N.S.D.C. from the processor.[11] For the remainder of the quota allocation, in addition to the stand-by volume which will be used to manufacture dairy products, the producer will receive the Class II or Class III price, the former if his milk is made into cottage cheese or ice cream, and the latter if it is made into cheddar cheese or skim milk powder. Milk received by the processor in excess of both his fluid and manufacturing needs can be sent to the cheese factory in Truro, and for this the producer will receive the Class III price (see Appendix Table 3).

Quota restrictions on manufacturing milk were slow to appear in the provinces of Canada, although in Nova Scotia in some respects the supply of manufacturing milk was always restricted indirectly by the fluid milk quotas, part of which, with the 10-20 percent stand-by, was used as manufacturing milk. In Nova Scotia restrictions for manufacturing milk were never required since few producers shipped milk exclusively for manufacturing purposes. Even today, of the 1,023 shippers of milk in Nova Scotia, only three supply Class III milk and 300 of

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[11] Report of the Nova Scotia Milk Industry Inquiry Committee, 1966-1967, p. 76.

the smallest shippers supply cream for Class IV purposes.[12]

When quota restrictions specifically for manufacturing milk did come into effect, they were introduced as federal programs. The circumstances that brought them about began with the Agriculture Stabilization Act of 1958.[13] This Act set up support payments at a minimum of 80 percent of the average market price of the ten previous years for manufacturing milk and offer-to-purchase programs for excess manufacturing milk products in Canada. As a result of this encouragement to produce, surplus stocks of butter and milk powder accumulated in the country during the 1960's. Because of Canada's high-price, uncompetitive position in world markets, it was necessary, if industry returns were to be maintained, that the national supply be cut back to equal demand.

In 1966 the Canadian Dairy Commission (C.D.C.) was formed in an effort to accomplish this. Previous support prices and offer-to-purchase programs were retained by the C.D.C., and an additional direct subsidy on the dairy products, butter, cheddar cheese, and milk

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[12]Direct correspondence with the Nova Scotia Dairy Commission.

[13]The National Dairy Council of Canada, "Evolution of the Market Sharing Quota System in Canada."

powder was instituted in order to raise the incomes of producers. However, in order to finance the export of surplus dairy products, a holdback to be deducted by the C.D.C. from subsidy payments to the producers was set up on manufacturing milk and cream (Table 7). In 1969 the holdback on over-quota milk was significantly increased in an attempt to discourage production in excess of quotas.

A second type of quota which affected the industry in Nova Scotia was set up in 1967. This was the federal subsidy eligibility quota, by which the C.D.C. fixed a maximum yearly quantity of Canadian-produced manufacturing milk on which it would pay a new subsidy (Table 8). Each year this quota is divided among the provinces in proportion to their production of the previous dairy year, and distributed among individual producers by the provincial dairy agencies. Fluid milk producers also receive a subsidy eligibility quota for that percentage of their milk used as manufacturing milk. This quota provided some incentive for farmers to restrict milk output to quota levels, since they would receive the subsidy only for milk within their quota, but it still did not restrict them from producing excess-quota manufacturing milk to sell at lower market prices.

Table 7

Holdback for Export Equalization Account Deducted from Subsidy Payments on Manufacturing Milk by C.D.C.

| Dairy Year | Holdback on quota | | Holdback on over-quota | |
|---|---|---|---|---|
| | Man. milk (¢/cwt) | Cream (¢/lb.B.F.) | Man. milk (¢/cwt) | Cream (¢/lb.B.F.) |
| 1966-67 | 10 | | | |
| 67-68 | 11 | | | |
| 68-69 | 15-21 | | | |
| 69-70 | 26 | 1 | 52 | |
| 70-71 | 26 | 1 | 125 | 8 |
| 71-72 | 10 | 0 | | |
| 72-73 | 10 | 0 | | |
| 73-74 | 10 | 0 | | |
| Discon-tinued | | | | |

Source:

Report of the Nova Scotia Milk Industry Inquiry Commission, 1966-1967.

R. L. Mason, "Quotas as Applied to Marketing Milk in Nova Scotia," Nova Scotia Dairy Commission.

Table 8

Direct Subsidy on Manufacturing Milk Under Subsidy Eligibility Quota, Set Up 1967-68, and Target Return Under M.S.Q.

| Dairy Year | Subsidy ($/cwt) | Target Subsidy ($/cwt) |
|---|---|---|
| 1967-68 | $1.21 | |
| 68-69 | 1.31 | |
| 69-70 | 1.25 | |
| 70-71 | 1.25 | |
| 71-72 | 1.25 | 5.14 - 5.39 |
| 72-73 | 1.25 | 5.65 |
| 73-74 | 1.45 | 6.45 - 7.17 |
| 74-75 | 2.30 - 2.56 | 8.50 - 9.41 |
| 75-76 | 2.66 | 11.02 |
| 76-77 | 2.66 | 11.45 |
| 77-78 | 2.66 | 11.83 - 12.18 |
| 78-79 | 2.66 | 12.42 |

Sources:

Report of the Nova Scotia Milk Industry Inquiry Committee, 1966-1967.

Mason, op. cit.

Agriculture Canada, Dairy Program Announcement, April 13, 1978.

Table 9

Market-Sharing Quota Entitlement, Nova Scotia and Canada
(Million pounds of Butterfat (B.F.) or 30,000,000 pounds of milk)

| | | 1974-75 | 1975-76 | 1976-77 | 1977-78 | 1978-79 |
|---|---|---|---|---|---|---|
| Nova Scotia | - Total | 4.1-4.4 | 4.1 | 4.1 | | |
| | - as % of Canada | .86-.92% | .92-.96% | 1.2% | | |
| Canada | - Total | 476.1 | 447.6-425.7 | 351.7 | 345.6 | 345.6 |

Source:

The National Dairy Council of Canada, "Evolution of the Market-Sharing Quota System in Canada," 1977.

Table 10

Levies Set Up Under the M.S.Q. in 1970

| Dairy Year | Levy on Quota | | Levy on Over-Quota | |
|---|---|---|---|---|
| | Man. milk ($/cwt) | Cream (¢/lb.B.F.) | Man. milk ($/cwt) | Cream (¢/lb.B.F.) |
| 1970-71 | $ .26 | 1¢ | $2.40 | 50.28¢ |
| 71-72 | .10 | 0 | 2.40-2.05 | |
| 72-73 | .10 | 0 | 1.05 | |
| 73-74 | .10 | 0 | | |
| 74-75 | .15 | | | |
| 75-76 | .45-.90-.65 | 0 | 4.00 | |
| 76-77 | 1.35 | | 8.60 | |
| 77-78 | 1.20 | | 7.00 | |
| 78-79 | 1.00 | | 7.50 | |

Sources:

Report of the Nova Scotia Milk Industry Inquiry Committee, 1966-1967.

Mason, op. cit.

This levy for export equalization of surplus dairy products has been substituted for the former holdback, which was discontinued in 1974. By this quota system the C.D.C. attempts to restrict national production.

Under the Market-Sharing Quota (M.S.Q.) producer prices for milk were at first determined by cabinet decision, but since April 1975 a "target support price" determined by the Returns Adjustment Formula[14] has been used as a guide to setting prices (see Table 8). The producer does not receive the full "target support price" or target return, as levies for transportation costs, provincial administration and export equalization are deducted from this price. Otherwise the target is achieved through the use of subsidies and support prices (Table 11).

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[14]The Returns Adjustment Formula consists of two main elements, an index of dairy cash input prices that evaluates production costs and is given a weight of 45 percent, and the Consumer Price Index having a weight of 35 percent. The remaining 20 percent is assigned to other judgement factors. Source: The National Dairy Council of Canada.

Table 11

Canadian Support Prices

| Dairy Year | Butter (¢/lb.) | Cheddar Cheese (¢/lb.) | Skim Milk Powder (¢/lb.) |
|---|---|---|---|
| 1965-66 | 64¢ | 35¢ | 0 |
| 66-67 | 59 | 38 | 0 |
| 67-78 | 63 | 38 | 20 |
| 68-69 | 63-65 | 42-47 | 20 |
| 69-70 | 65 | 42-47 | 20 |
| 70-71 | 65 | 47-51 | 20 |
| 71-72 | 65-68 | 51-54 | 24-26 |
| 72-73 | 68 | 54 | 29 |
| 73-74 | 71 | 60 | 35-38 |
| 74-75 | 77-90 | 60 | 50-59 |
| 75-76 | 103 | 60 | 64 |
| 76-77 | 108 | 60 | 68 |
| 77-78 | 118-122 | | 70-72 |
| 78-79 | 127 | | 74 |

Sources:

Report of the Nova Scotia Milk Industry Inquiry Committee, 1966-1967.

Mason, op. cit.

Agriculture Canada, Dairy Program Announcement, April 13, 1978.

# Chapter 3

# ECONOMIC DETERMINATION OF AGRICULTURAL PRICES AND OUTPUT, AND CRITERIA FOR MARKETING AGENCY PERFORMANCE

## ECONOMIC THEORY OF AGRICULTURAL PRODUCTS

The agricultural sector is often identified as coming close to being perfectly competitive, with each type of agricultural product produced by many producers so that no one producer has a significant influence on market price. The agricultural sector, however, displays certain characteristics which cause problems. First, agricultural prices relative to other prices have been falling over the past fifty years. In addition, agricultural prices tend to fluctuate more than prices of nonfarm goods due to fluctuations in supply, thus affecting farm incomes, even though farm output is more stable than industrial output. Finally it is generally recognized that the demand curve for farm products is relatively inelastic.

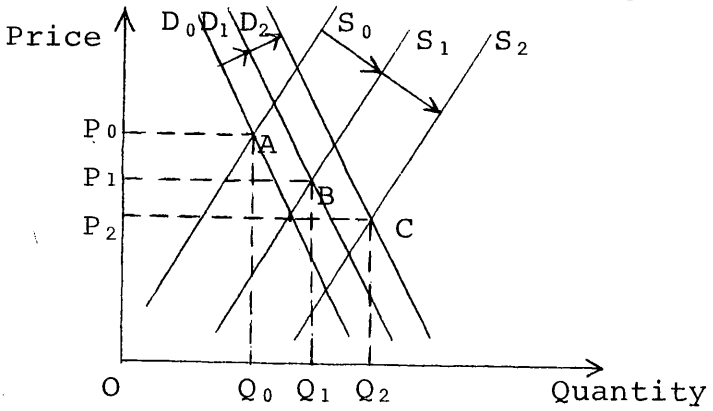
Agriculture's problem is especially acute because the sector has experienced very high growth rates in productivity, encouraged by technological improvements

of farm equipment, government-subsidized research, subsidies, and government-assured demand for output at a stable price (support programs). If the productive capacity of the economy is growing and if productivity is expanding uniformly among industries, the demands for goods with low income elasticities will be expanding more slowly than output. In our economy most foodstuffs have low income elasticities because people are already well-fed. As a result of this, excess supply of agricultural products will develop, prices and profits will be greatly depressed, resources will move out of the sector, and in a free-market economy agriculture will be a contracting sector.

In Figure 3 below the demand and supply curves for farm products at different points in time are shown.

Figure 3

Shifts in Demand and Supply - Agriculture



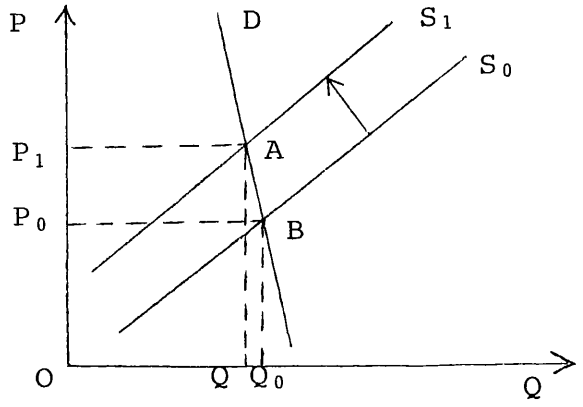

Source: E. Mansfield, Microeconomics, Theory and Applications (New York: W. W. Norton & Co., Inc., 1970), p. 246.

Supply expands faster than demand, given the low income elasticities; and as a result prices and total revenues fall, $OP_0$ A $Q_0$ > $OP_2$ C $Q_2$.

With regard to the dairy industry, in the short run the supply of milk is subject to such uncontrollable factors as disease, weather, and seasonal conditions. Unplanned fluctuations in quantity supplied cause price variations in the opposite direction to supply changes. For given supply fluctuations the price changes will be larger the lower the elasticity of demand for the product. Because the demand for milk is inelastic, good harvests in terms of high levels of milk production will bring proportionally larger reductions in price and a reduction in total farm revenues, while low production will bring revenue increases. Meanwhile high production will raise total costs and low production reduce total costs. The combination of lower total revenues and higher costs in times of high production will cause a farmer's net income to fall, while higher total revenues and lower costs accompanying low production levels will cause net income to rise. From this it appears that the interests of the farmer and consumer are opposed to each other. It can be seen from Figure 4 that a larger propotional increase in price occurs as supply decreases, and thus revenues increase, $OP_1A$ $Q_1$ > $OP_0$ B $Q_0$.

Figure 4

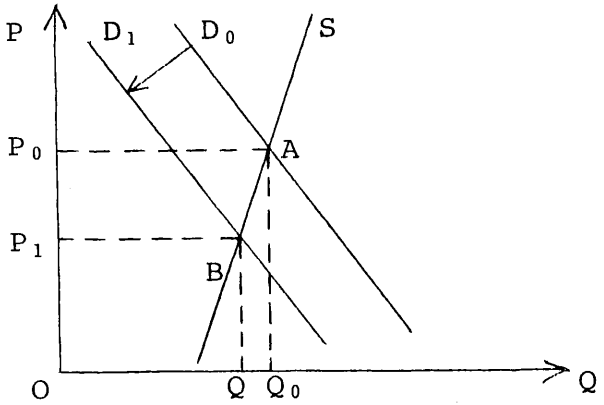
Inelastic Demand




Agricultural markets are also subject to short-run cyclical instabilities due to shifts in demand. During times of depression the demand for products generally falls. While industrial products have rather elastic supply curves, agricultural products tend to have inelastic supply curves, so that when demand falls prices tend to fall drastically, as shown in Figure 5, and total farm revenues are greatly decreased, from $OP_0$ A $Q_0$ to $OP_1$ B $Q_1$.

Figure 5

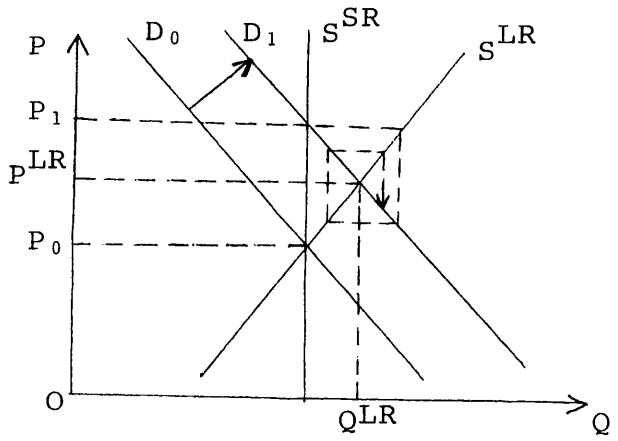
Inelastic Supply as Well as Demand



Further instability in prices and incomes in the agricultural sector results from cycles induced by supply lags. Given a shift in demand, the movement of price to the new equilibrium will be delayed to the extent that the induced changes in the desired level of production require some interval of time to be implemented. The characteristic supply lag in dairying is quite complex. Farmers can meet an increase in demand for fluid milk to some degree in the short run by diverting milk from manufacturing uses, but to satisfy an overall increase in demand in the long run a delay of at least two years until calves can be raised and bred to produce milk is required. In the intervening period the whole effect of the rise in demand will be reflected in a price increase. The whole process of arriving at the new equilibrium price and production level will probably follow the cobweb pattern (see Figure 6).

Figure 6

Shifts in Demand with Short-run and Long-run Supply Functions



In the short run the supply of milk is practically fixed at $S^{SR}$. If demand rises price will rise from $P_0$ to $P_1$ under competitive market conditions, until the supply can be increased to $S^{LR}$ over a period of two years. Price fluctuations will tend to follow the cobweb pattern until they reach the long-run equilibrium price $P^{LR}$ and long-run production level $Q^{LR}$.

Agricultural Stabilization and Support Plans

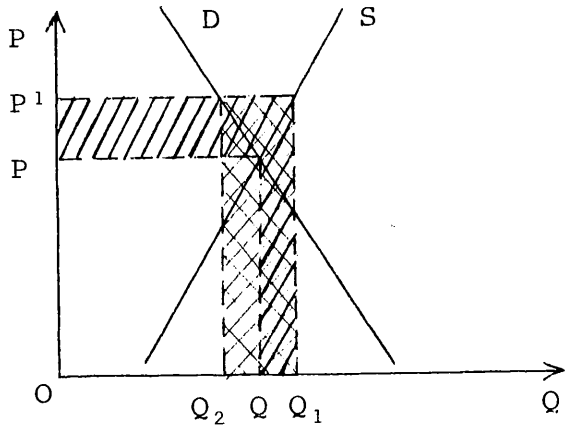
For many farm products, as for several dairy products, the federal and provincial governments have established support prices in an attempt to stabilize and increase farm prices and incomes. In such cases the competitive model is inappropriate to predict price and output, but its basic elements can still be used in analysing the effects of such a program.

As shown in Figure 7, a support price $OP^1$ is set above the equilibrium price OP, with the consequence that output will equal $OQ_1$ after a lag, and consumer will demand $OQ_2$. The excess supply of output $OQ_1$-$OQ_2$ must be purchased by the government at the support price through an offer-to-purchase program. Farmers will thus receive more for their production than they otherwise would, causing their receipts to increase by $OP^1(OQ_1) - OP(OQ)$, equal to the area shaded. The expense to the government would be $OP^1(OQ_1 - OQ_2)$, the

hatched area. Such a program is in effect in Canada for the dairy products butter, cheddar cheese and skim milk powder.

Figure 7

Effect of a Price Support



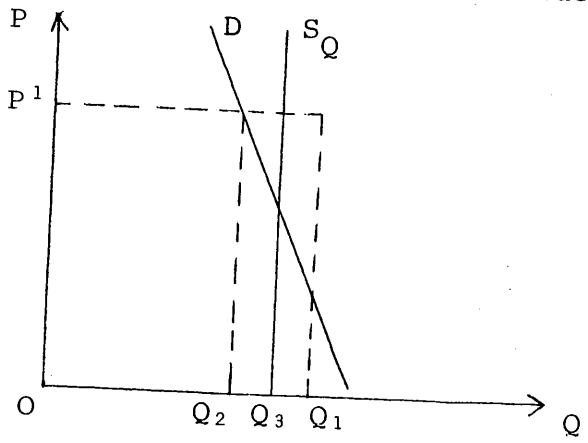

Even if the government succeeded in completely stabilizing prices through the use of support prices, it would not succeed in stabilizing farmers' revenues unless it instituted a supply control program at the same time. Without supply control support prices would merely reverse the pattern of total income fluctuations. With the government buying all farmers could produce each year as an unchanging price, revenues would be high when production was high and low when production was low. Revenues would thus fluctuate directly, instead of inversely, with changes in supply.

In order to minimize the amount that the government would have to purchase of excess products and in order

to stabilize farm revenues, production controls could be imposed. These take the form of quotas in the dairy industry; their operation is shown in Figure 8.

Figure 8

Effect of a Quota Imposed on Production




Let $OQ_3$ be the total quota, say the federal Market-Sharing Quota for manufacturing milk imposed on the industry. Because of the imposition of supply control the government's expenditures would be reduced from $OP^1(OQ_1 - OQ_2)$ as shown in Figure 7 to $OP^1(OQ_3 - OQ_2)$ in Figure 8, where $OQ_3$ is less than $OQ_1$.

With price supports and quotas farmers' incomes can be stabilized fairly well. The only problem with price supports and offer-to-purchase programs is that when a quantity larger than $OQ_2$ is allowed to be supplied by farmers and price is supported above the long-run equilibrium, as has occurred in the Canadian dairy industry, surplus stocks accumulate over time. Since the Agricultural Stabilization Act was passed in 1958 and

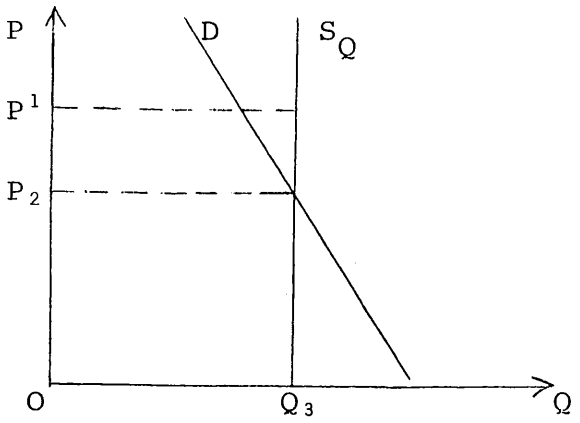
nine agricultural commodities, including butter, cheddar cheese and skim milk powder, were supported at no lower than 80 percent of their average price of the preceding ten years, stocks have accumulated in Canada. Huge stocks of butter and skim milk powder now exist in Canada because of support prices and offer-to-purchase programs. This has led to a shift from these types of programs to other methods such as direct subsidies for some agricultural products, and an attempt to reduce quotas, notably the Market-Sharing Quota of the dairy industry, to the size of market demand.

Direct subsidies given by the government to producers on every unit of their output ensure that they receive a target price for their products. Farmers are guaranteed a target price of $OP^1$, as shown in Figure 9, but rather than purchasing and storing excess production, the government allows the competitive market to operate after the imposition of a quota. Thus $OQ_3$ is produced and sold at a market price of $OP_2$. Then the government issues subsidy cheques to farmers to cover the difference between the price they received and the target price. This would cost the government $(OP^1 - OP_2)OQ_3$.

Which of these programs is the cheapest to the government depends upon the elasticity of demand for the product in question. Since the demand for agricultural products is usually inelastic, the cost of direct subsidies will tend to be greater than that of price supports.

Figure 9

Direct Subsidies Given for All Quota Output



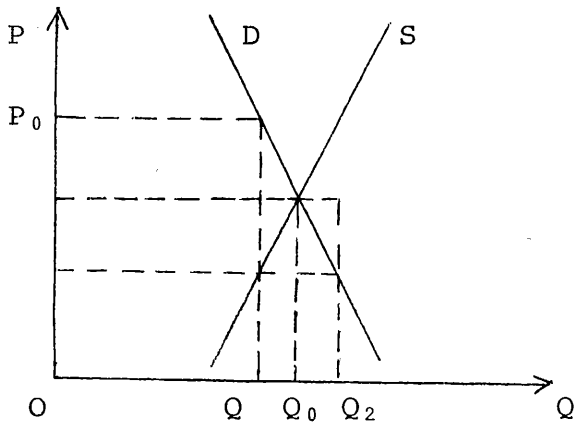

All three income support and stabilization schemes involve some inefficiencies. First, with support prices the total industry cost of producing output is higher than it would be without supports because producers with high marginal costs are protected, whereas in perfect competition they would be forced out of the industry. Second, part of the industry's output is unnecessary and is taken off the market by the government. Third, the consumer price is set above the marginal cost of producing the product. With direct subsidies the second inefficiency is eliminated, but the other two remain.

Another method used by marketing boards and commissions to prevent fluctuations in the price and total receipts that farmers receive is that of pooling output and levelling out the supply actually coming onto the market in spite of variations in production. From Figure 10 it can be seen that total revenues can be

stabilized by keeping sales constant at an equilibrium price $P_0$ and quantity $Q_0$. If production is greater than $Q_0$, that in excess of $Q_0$ will be stored by the marketing agency and sold at a time when production is less than $Q_0$. By this method equity among producers can be established by dividing the total revenues from sales among producers according to their contribution to total production, so that each receives the same per unit price for his product. This again has the inefficiency of protecting uneconomical producers at the cost of the efficient producers, thus raising costs substantially in the industry. The Nova Scotia dairy industry does not have a pooling program as it has been opposed by the majority of producers for the past decade, and especially by the larger-scale producers, who say they would lose from it.

Figure 10

Stabilizing Output and Price over the Long-run by Pooling



## CRITERIA FOR EVALUATION OF THE NOVA SCOTIA DAIRY INDUSTRY'S PERFORMANCE UNDER A MARKETING AGENCY

In order to evaluate the performance of an industry operating under the regulation of a marketing agency it must first be determined what the objectives are for establishing such an agency, and thus what the agency can be expected to accomplish. The number of agricultural marketing boards has grown every rapidly over the last twenty years, and while their activities and objectives vary widely the concept of supply management designed to administer prices appears common to most boards.

The Nova Scotia Dairy Commission, like most agricultural marketing agencies, has two primary objectives:

1) to eliminate cyclical and unpredictable price fluctuations for milk, and

2) to set prices at a level that will assure farmers an adequate income or a "fair" return to their labor and capital.

The reason for the creation of the new administration is summarized as follows:

> The purpose is to provide efficient producers of milk and cream with a fair return for their product, which will enable them to maintain an adequate supply of satisfactory quality, which will be available to the consumer of dairy products at a reasonable price.[15]

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[15] Report of the Nova Scotia Milk Industry Inquiry Committee, 1966-1967, p. 141.

In addition to providing price stability and adequate returns to the producer, the N.S.D.C. is expected to ensure a good quality of milk in the industry, guarantee a reasonable consumer price, and by implication be concerned about industry efficiency.

In addition to these basic objectives of a marketing agency, there are other important factors identified by L. F. Kristjanson which should characterize such a body if it is to have lasting success.[16] These secondary objectives are:

1) the maintenance of an innovative climate in the industry and a corresponding search for new and larger markets,

2) the maintenance of single proprietorship or the family enterprise in the productive sector, and the limiting of the size of productive units,

3) the achievement of production efficiency and production cost minimization, and

4) the influencing of income distribution so that a larger share of the consumer dollar goes to the producer.

Kristjanson states that these goals should be constantly kept in view by regulatory agencies in order that they

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[16] L. F. Kristjanson, "Are Marketing Boards and Commissions Encouraged to Place Excessive Emphasis on Supply Management and Control?," Proceedings of the Federal-Provincial Marketing Seminar, Ottawa: National Farm Products Marketing Council, 1977, pp. 38-44.

avoid becoming preoccupied with supply management and control, which gradually leads to stagnation and deterioration in the performance of an industry.

## DEMAND ANALYSIS FOR FLUID MILK

It was earlier indicated that fluid milk sales as a percentage of total milk production has been rising steadily, and an effort is now made to specify a demand function for fluid milk in Nova Scotia. This function can be expressed as follows:

$$DFM = A + a\ RYPNS + b\ RP, \qquad (1)$$

where

DFM = quantity of fluid milk sold, in thousands of hundredweights.

RYPNS = real personal income in millions of dollars for the province of Nova Scotia, expressed in constant 1963 dollars.

RP = real fluid milk prices, expressed in constant 1963 dollars.

A linear function is specified, with the period under examination being 1962-1977. The following result was derived from the regression analysis:

$$DFM = \underset{(17.813)}{1153.27} + \underset{(11.605)}{.4184}\ RYPNS - \underset{(1.260)}{24.3877}\ RP \qquad (1.i)$$

$R^2 = .986 \qquad S = 21.80 \qquad D\text{-}W = 1.43$

The results conform to the a priori specifications based on theory.

The R-squared is very high at .986, and the equation yielded t-values that are statistically significant, though the t-value for the price variable is significant at only an 85 percent confidence level. The Durbin-Watson statistic indicates some degree of indeterminacy. The actual and predicted values of fluid milk sales based on constant 1963 dollars are shown in Figure 11. From this it appears that the equation can be used to predict fluid milk sales quite accurately.

The elasticities of demand calculated from the equation 1.i for the income and price variables are .40 and .09 respectively. A comparison with the results derived in other studies can be seen in Table 12. It can be seen that the price elasticity of demand for fluid milk is very low in Nova Scotia. This has significant policy implications for the N.S.D.C. which will be discussed in a later chapter.

Figure 11

Actual and Predicted Values for Fluid Milk Sales in Nova Scotia
for the Period 1962-1977

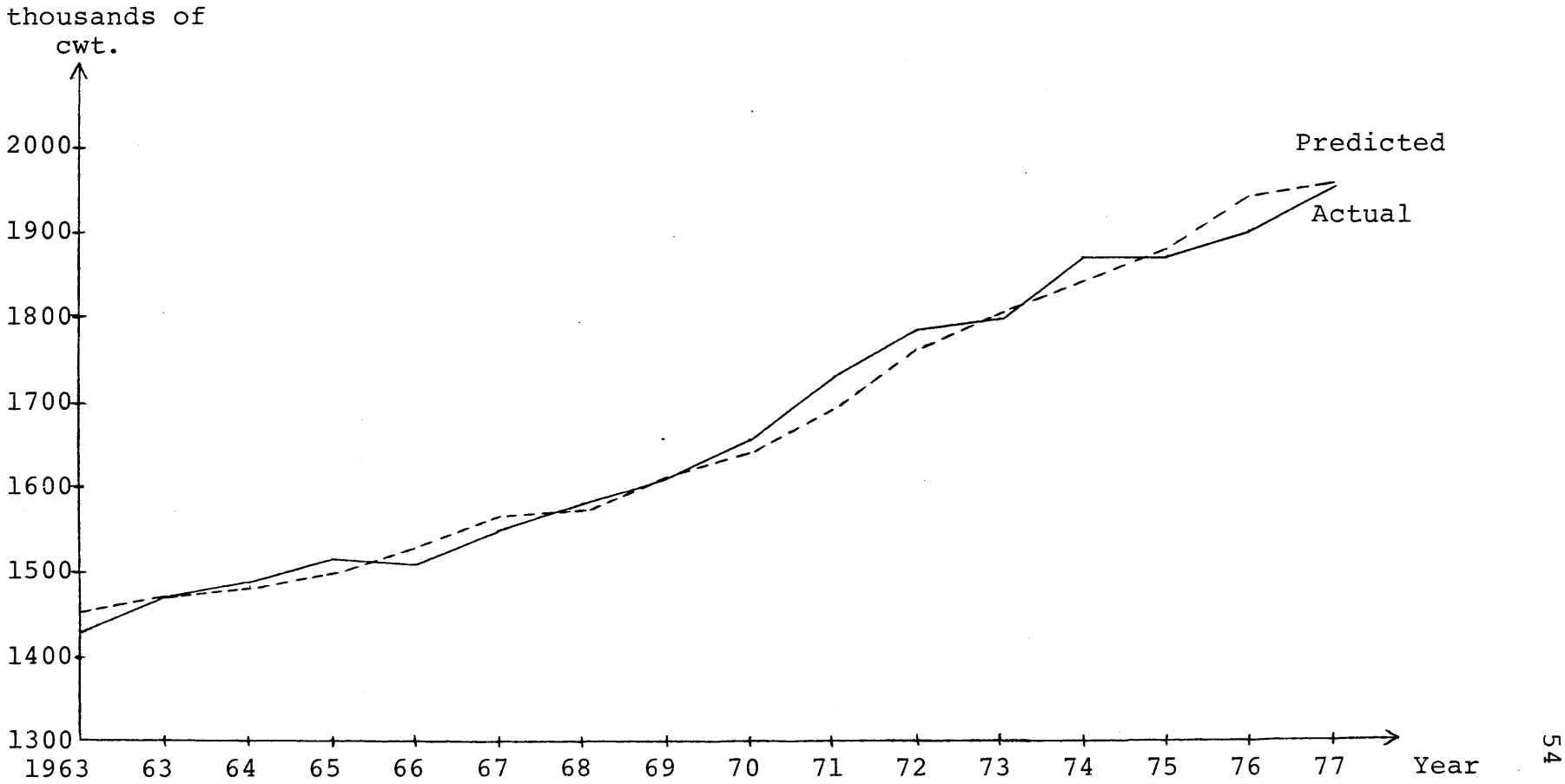

Table 12

Price and Income Elasticities for Dairy Products from Various Studies

| Study | Direct-price elasticities | | | Income elasticities | | |
|---|---|---|---|---|---|---|
| | Fluid milk | Butter | Cheese | Fluid milk | Butter | Cheese |
| 1) Perkins et al., for Canada 1957-66 | .28 | 1.24 | .91 | | -.75 | 1.35 |
| 2) Sahi, for Canada, 1958-72 | .32 | 1.05 | .55 | .83 | .36 | .64 |
| 3) Hassan & Sahi, for Canada, 1958-72 | .44 | 1.06 | .86 | .61 | .61 | .98 |
| 4) Barewal, for Canada, 1961-74 | | | | .08 | .11 | .65 |
| 5) Hassan & Johnson, for Canada | .44 | .86 | .91 | .21 | .29 | .52 |
| 6) Own regressions for Nova Scotia, 1962-77 | .09 | | | .40 | | |

Sources:


1,2, & 3. Z. A. Hassan and R. K. Sahi, "Consumer Demand for Dairy Products in Canada," Canadian Journal of Agricultural Economics, 24, 1 (February, 1976).

4. S. Barewal, "Demand Projections for Agricultural Commodities, 1980 and 1985," Canadian Farm Economics, 11, 2 (April, 1976).

5. Z. A. Hassan and J. R. Johnson, "The Demand for Major Foods in Canada," Canadian Farm Economics, 12, 2 (April, 1977).

# Chapter 4

## PERFORMANCE OF THE INDUSTRY UNDER THE NOVA SCOTIA DAIRY COMMISSION

In this chapter the performance of the industry, primarily at the primary producer level, is analysed on the basis of the objectives associated with the Nova Scotia Dairy Commission in the preceding chapter. In general terms, producer price stability and price levels, which along with supply stability directly affect producer net income stability and adequacy, are examined. Producer income stability and adequacy, followed by efficiency of production and its implications for producer returns is discussed as well as the consumer price level as a criterion of marketing agency success in the eyes of the public.

Since its inception in 1967 the N.S.D.C. has controlled the Class I and II milk prices in the province, fixing the minimum producer, wholesale (processor) and retail (consumer) prices for milk and milk products in these two classes. Prices for Class II milk have historically been lower than those in Class I. The Class III price is controlled by Twin Cities Dairy, which runs the only cheese factory in the province. The N.S.D.C.'s aim in price-fixing is to generate income stability and

adequacy for the producer. The effectiveness of price regulation in accomplishing this goal can be seen by first examining producer price stability and the price level.

## PRODUCER PRICE STABILITY

In order to evaluate producer price stability post-1967 prices were compared with: a) pre-1967 prices, and b) prices that might have existed during the past decade in the absence of regulation.

Before the N.S.D.C. was set up the Board of Commissioners of Public Utilities administered the control of the dairy industry in mainland Nova Scotia and under it Nova Scotia was divided into controlled and uncontrolled areas. In the controlled areas minimum producer prices were fixed by the Board, but these prices varied from area to area within the province (Table 13). Halifax prices can be taken as representative of those in controlled areas (Table 14). Although minimum producer prices changed in the pre-1967 period, there was nevertheless instances of some stability for fluid milk prices; in one instance this occurred for approximately six consecutive years, 1951-1956.

Even within the latter stability there were some seasonal fluctuations in prices within each year. In the winter months, when production was low, the Board would raise the producer price over the summer price by 60¢ in an attempt to assure an adequate milk supply and

Table 13

Minimum Fluid Milk Producer Prices in Controlled Markets of Nova Scotia, Selected Years
($/cwt)

| Area | 1941 | 1946 | 1951 | 1956 | 1958 | 1964 | 1966 |
|---|---|---|---|---|---|---|---|
| Halifax | 2.25 | 3.25 | 4.60 | 4.60 | 5.15 | | |
| Sydney | 2.80 | 3.55 | 5.15 | 5.15 | 5.70 | | |
| Yarmouth | 2.30 | 3.15 | 4.40 | 4.40 | 4.95 | | |
| Amherst | 2.89 | 3.15 | 4.15 | 4.40 | 4.95 | | |
| New Glasgow | 2.30 | 3.08 | -- | -- | -- | | |
| Liverpool | | 3.15 | 4.15 | 4.40 | 4.95 | | |
| Kentville | | 3.15 | 4.15 | 4.40 | 4.95 | 5.22 | 5.70 |
| Windsor | | 3.15 | 4.15 | 4.40 | 4.95 | | |
| Truro | | 3.15 | 4.15 | 4.40 | 4.95 | | |
| Bridgewater | | 3.15 | 4.15 | 4.40 | 4.95 | | |
| Springhill | | | 4.15 | 4.40 | 4.95 | | |
| Pictou | | | 4.15 | 4.50 | 5.05 | | |
| Pictou County | | | 4.70 | -- | -- | | |
| Digby | | | 4.40 | 4.40 | 4.95 | | |
| Annapolis Royal | | | 4.40 | 4.40 | 4.95 | | |
| Chester | | | | 4.40 | 4.95 | | |
| Cumberland County | | | | | | 5.13 | |

Source:

Nova Scotia Department of Agriculture and Marketing, Annual Report of the Department of Agriculture and Marketing, 1952, 1957, 1964, 1966. Halifax: Queen's Printer.

Table 14

Minimum Average Fluid Milk Producer Prices for Halifax Area

| Year | Average fluid milk price ($/cwt) | | Changes in prices due to seasonal factor | |
|---|---|---|---|---|
| 1941 | $2.25 | | | |
| 1942 | 2.45 | | | |
| 1943 | 2.70 | | | |
| 1944 | 2.70 | | | |
| 1945 | 2.70 | | | |
| 1946 | 3.25 | | | |
| 1947 | 3.85 | | | |
| 1948 | 3.85 | | | |
| 1948 | 3.85 | | | |
| | | ( | Dec.6/48 - March 31/49 | $4.30/cwt |
| 1949 | 4.30 | ( | Apr. 1/49 - Sept. 30/49 | 4.00 |
| | | ( | Oct. 1/49 - Mar. 31/50 | 4.60 |
| 1950 | 4.30 | ( | Apr. 1/50 - Sept. 30/50 | 4.00 |
| | | ( | Oct. 1/50 - Dec. 31/50 | 4.60 |
| 1951 | 4.60 | | | |
| | | ( | Dec. 1/51 - Mar. 31/52 | 4.90 |
| 1952 | 4.60 | ( | Apr. 1/52 - Sept. 30/52 | 4.30 |
| | | ( | Oct. 1/52 - Mar. 31/53 | 4.90 |
| 1953 | 4.60 | ( | Apr. 1/53 - Sept. 30/53 | 4.30 |
| | | ( | Oct. 1/53 - Mar. 31/54 | 4.90 |
| 1954 | 4.60 | | | |
| 1955 | 4.60 | ( | Apr. 1/54 - Sept. 30/55 | 4.30 |
| | | ( | Oct. 1/55 - Mar. 31/56 | 4.90 |
| 1956 | 4.60 | | | |

Source:

N. S. Department of Agriculture and Marketing, Annual Report of the Department of Agriculture and Marketing, 1597.

stabilize the producers' incomes. The Board was unable to eliminate seasonal variation in prices, which persisted in the province until the late 1960's.

It can be seen from Tables 15 and 16 that in the post-1967 period producer prices were to a degree more variable than the prices in the pre-1967 period. Between 1968 and 1978 there were a total of thirteen different price changes in Nova Scotia, and with the exception of the years 1973 and 1974 price changes came about a year apart. In 1973 and 1974 there were a total of six price changes, with three changes occurring each year. In only one instance in the post-1967 period did the price remain unchanged for two consecutive years. Over the period from 1968 to 1978 fluid milk prices increased by more than 100 percent, substantially more than it increased in either of the two previous decades. While it would appear that there were relatively large price changes over the 1968-1978 period, it is somewhat unrealistic, given the high ratio of price and wage inflation in other sectors of the economy, to expect changes in milk prices, when made, to be small. A comparison between fluid milk prices in Nova Scotia and the food price index is carried out in the next section.

Under the present system the more serious variation in prices arising from seasonal factors has been eliminated; prices are not changed seasonally by the N.S.D.C. Rather

Table 15

Fluid Milk Producer Prices in Controlled Areas, 1968-1977
($/cwt)

| Area | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 |
|---|---|---|---|---|---|---|---|---|---|---|
| Nova Scotia mainland | 6.70 | 7.20 | 7.20 | 7.50[o] | 8.00[x] | 9.98[a] | 12.18[b] | 13.08[c] | 13.46[d] | 14.11[e] |
| Cape Breton Island | 6.90 | 7.60 | 7.60 | 7.80 | 8.30 | 10.28 | 12.48 | 13.46 | 13.84 | 14.54[e] |

Source:

Personal correspondence with the N.S.D.C.

[o]Effective July 1, 1971

[x]Effective August 1, 1972

[a]April 1, 1973 - 8.44
August 1, 1973 - 9.20
October 1, 1973 - 9.98

[b]April 15, 1974 - 11.04
October 1, 1974 - 11.95
December 1, 1974 - 12.18
Cape Breton prices 30¢ higher

[c]Effective October 1, 1975

[d]Effective December 1, 1976

[e]Nova Scotia mainland - effective October 1, 1977
Cape Breton Island - October 1, 1977 - 14.49
- December 1, 1977 - 14.54

Table 16

Producer Milk Prices for Mainland Nova Scotia, 1941-1978

| Year | Fluid milk Class I | | Manufacturing milk Class II | | Milk for cheese Class III | Cream for butter Class IV | |
|---|---|---|---|---|---|---|---|
| | $/cwt | % change | $/cwt | % change | ($/cwt) | ¢/lb. B.F. | Approx. $/cwt milk |
| 1941 | 2.52[a] | | | | | 37.4 | 1.25 |
| 1946 | 3.38 | >34.1 | | | | 51.2 | 1.71 |
| 1951 | 4.82 | 13.0 | | | | 67.5 | 2.25 |
| 1956 | 4.82 | 0 | | | | 60.4 | 2.01 |
| 1961 | 5.02 | 4.1 | 2.85[b] | | | 65.8 | 2.19 |
| 1962 | 4.96 | 1.2 | 2.82 | -1.1 | | 65.5 | 2.18 |
| 1963 | 4.95 | -0.2 | 2.73 | -3.2 | | 64.4 | 2.15 |
| 1964 | 5.22 | 5.5 | 2.69 | -1.5 | | 65.0 | 2.17 |
| 1965 | 5.30 | 1.5 | 2.74 | 1.9 | | 65.8 | 2.19 |
| 1966 | 5.70 | 7.6 | 2.90 | 5.8 | 2.91 | 63.0 | 2.10 |
| 1967 | 5.95 | 4.4 | 3.34[c] | 15.2 | 2.94 | 63.2 | 2.11 |
| 1968 | 6.70 | 12.6 | 3.54 | 6.0 | 2.88 | 64.5 | 2.15 |
| 1969 | 7.20 | 7.5 | 4.00 | 13.0 | 2.89 | 64.8 | 2.27 |
| 1970 | 7.20 | 0 | 4.00 | 0 | 2.88 | 64.8 | 2.27 |
| 1971 | 7.50 | 4.2 | 4.40 | 0 | 3.27 | 66.6 | 2.33 |
| 1972 | 8.00 | 6.7 | 4.40 | 0 | 4.14 | 68.5 | 2.40 |
| 1973 | 9.98 | 24.7 | 5.25 | 19.3 | 4.20 | 70.9 | 2.48 |
| 1974 | 12.18 | 22.0 | 7.10 | 35.2 | 5.30 | 83.8 | 2.93 |
| 1975 | 13.08 | 7.4 | 7.71 | 8.6 | 6.77 | 104.5 | 3.66 |
| 1976 | 13.46 | 2.9 | 9.04 | 17.2 | | 112.0 | 3.92 |
| 1977 | 14.11 | 4.8 | 9.45 | 4.5 | 7.92 | 121.7 | 4.26 |
| 1978 | 14.52[d] | 2.9 | 10.00[d] | 5.8 | 8.24[d] | | |

Table 16 (cont'd)

Sources:

Statistics Canada, The Dairy Review, 1962-1977.

Nova Scotia Department of Agriculture and Marketing, Annual Report of the Department of Agriculture and Marketing, 1943, 1952, 1957, 1966-1970.

Personal correspondence with the N.S.D.C. for the 1968-1977 prices.

[a]Prices for 1941-1967 are average of controlled areas in Nova Scotia.

[b]Manufacturing prices to 1967 include milk and cream used in production of ice cream mix and concentrated milk products.

[c]From 1967 on, manufacturing milk redefined by Dominion Bureau of Statistics included milk for butter, cheese, ice cream and concentrates.

[d]August 1978 price.

the fluid milk quota system is used to effectively stabilize milk supply throughout the year to such an extent that prices can remain stable.

It is fairly difficult to compare prices under the present regulation with prices that would have presently existed in the absence of regulation, but it may quite safely be concluded that existing prices are more stable than they would have been had free market competition been allowed to operate in the industry. In the first place, fluid milk has a lagged supply response, so that when demand increases a substantial additional supply cannot immediately be brought forth to meet demand. As a result of this supply lag, prices are likely to change with every shift of the demand schedule that upsets industry equilibrium.

In the second place, studies have found both fluid milk and most dairy products to have an inelastic demand schedule. The dairy industry is thus susceptible to price instability, especially between different seasons of the year, notably between the winter months when the supply in a free market would be low but consumption high, and the summer months when the supply would be high but demand the lowest in Nova Scotia. The N.S.D.C.'s regulation restrains market forces from generating price instability.

## PRODUCER PRICE LEVEL

For approximately two decades following World War II, the rate of inflation of milk prices was very low compared to that of other foods in Nova Scotia. In a study done by the Nova Scotia Milk Industry Inquiry Committee it was found that between 1946 and 1966 bread prices, in terms of constant 1949 dollars, rose 15 percent, wages 55 percent, and milk prices -2 percent.[17] The same concept is reflected by the price indices of fluid milk and other foods in Table 17. From 1956 to 1966 food prices in general rose by 19.1 percent while milk prices rose by 11.7 percent, or about 60 percent of the rise in food prices. However in the ensuing period from 1967 to 1977 general food prices rose by 88.7 percent while milk prices rose by 108.8 percent, in other words, 23 percent more than food prices rose.

In the years prior to the administration by the N.S.D.C., producer fluid milk prices rose at a slower rate than the general rate of inflation for food prices in the economy, presenting farmers with a problem of decreasing returns per hundredweight; but under the control of the N.S.D.C. producer milk prices rose at a higher rate than

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[17] Report of the Nova Scotia Milk Industry Inquiry Committee, 1966-67, p. 123.

Table 17

Indices of Food and Fluid Milk Prices

| Year | Index of food price, annual averages Canada (1971 = 100) | Index of fluid milk price, Nova Scotia (1971 = 100) |
|---|---|---|
| 1956 | 69.6 | 64.3 |
| 1957 | 72.8 | -- |
| 1958 | 75.0 | -- |
| 1959 | 74.4 | -- |
| 1960 | 75.0 | -- |
| 1961 | 76.1 | 66.9 |
| 1962 | 77.5 | 66.1 |
| 1963 | 80.0 | 66.0 |
| 1964 | 81.3 | 69.6 |
| 1965 | 81.9 | 70.7 |
| 1966 | 88.7 | 76.0 |
| 1967 | 89.9 | 79.3 |
| 1968 | 92.8 | 89.3 |
| 1969 | 96.7 | 96.0 |
| 1970 | 99.9 | 96.0 |
| 1971 | 100.0 | 100.0 |
| 1972 | 107.9 | 106.7 |
| 1973 | 124.2 | 133.1 |
| 1974 | 143.4 | 162.4 |
| 1975 | 161.9 | 174.4 |
| 1976 | 163.6 | 179.5 |
| 1977 | 178.6 | 188.1 |

Source:

Statistics Canada, Consumer Prices and Price Indices, 1977; index of fluid milk price derived from fluid milk prices in Table 16.

other foods in the economy. Since 1973 the index for fluid milk prices has been higher than the index of other food prices. Although this evidence is not conclusive, it could be inferred that the N.S.D.C. has been effective in raising producer prices to a more adequate level. This has important implications for the income level adequacy of producers.

## PRODUCER NET INCOME STABILITY

The effort to secure price and supply stability is directed to obtain net income stability and adequacy for producers. Both income stability and income adequacy depend on the relationship between producer receipts from milk sales on one hand and farm operation costs on the other hand. This is shown by the equation $Y_{net} = TR - TC$, where $Y_{net}$ is producer net income, TR is total resceipts from farm operations, that is, milk sales, subsidies, livestock and crop sales and miscellaneous sales, and TC is total operation costs. Since receipts from milk sales and subsidies represent about 89 percent of total farm receipts for dairy producers,[18] it can be said that the producer's return per hundredweight of milk (or per cow) is the

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[18]Nova Scotia Department of Agriculture and Marketing, Nova Scotia Dairy Farm Business Summary, 1977.

difference between milk prices per hundredweight (or per cow) and production costs per hundredweight (or per cow).

Producer incomes vary when production costs change in relation to prices that producers receive for milk. The main struggle of Nova Scotia dairy farmers in the early 1970's was to cover their rapidly rising production costs, which rose by 61 percent between 1970 and 1976.[19] Producer net income at this time was unstable and becoming increasingly inadequate, forcing many dairymen to go out of business, and causing such decreases in provincial milk production that shortages began to occur in the market.[20] The N.S.D.C. was at this time refusing producer demands for higher producer prices because of its reluctance to see consumer prices rise.

The main cause of income instability, that is, variability of costs in relation to prices, can be eliminated through the use of the pricing formula used by the N.S.D.C. The formula is comprised of milk production cost items with percentage weights. These cost items are used to find annual cost constants, which are combined and indexed against the 1971 base year. These indices, applied

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[19] See Dairy Cash Input Price Index, Table 20.

[20] "Time is Running Out for the Dairy Industry," The Chronicle Herald, May 2, 1974; "Government, Farm Organizations Criticized by Dairy Farmer," ibid., October 4, 1974.

to the base year milk prices, can be used to show how much prices need to rise in order for producers to cover their costs. Thus major variability in the relationship between price and costs can be eliminated. In spite of its usefulness in this area the pricing formula is not as important in Nova Scotia pricing operations as it is in other provinces of Canada, where it is the sole instrument in determining producer price objectives (see Appendix Table 4). The N.S.D.C. uses the formula mainly to provide a monthly record of cost changes and uses other considerations besides it in arriving at a producer price.

Instability in producers' incomes also arises from the differences in price between fluid and manufacturing milk and the uncertainty as to what percentage of a producer's shipment will be used in each class of milk. This variability is of two types: 1) the variability that exists for the individual farmer arising from the fact that he can receive the Class I price for anywhere between 75 percent and 95 percent of his fluid quota shipment, and 2) the variability that exists between farmers in the average amount of quota for which each receives the Class I price, depending upon the plant to which he ships his production. In 1974 producers voiced discontentment about the operation of the largest Nova Scotia dairy, Twin Cities Dairy, because it was using up to 25 percent of its shippers' fluid quotas

to supply the Truro cheese plant with milk and paying its shippers low surplus milk prices for this quota milk. In September 1974 these prices averaged $8.81 per hundredweight, while the fluid milk price was $11.04 per hundredweight.[21] Meanwhile other dairies with limited manufacturing facilities used a much smaller percentage of their shippers' quotas for manufacturing purposes. In 1974-75 a number of producers tied with Twin Cities Dairy began to take their milk to Baxter's Dairy in New Brunswick so that they could sell all of their quota for Class I uses. These differences in utilization of milk shipments cause differences in the average price a producer receives for milk, and hence variation in his net income that has not yet been eliminated.

Producers can to a certain degree control the average price they receive for shipments. As shown in Appendix Table 3, the more milk a producer ships in excess of his quota the lower his average return per hundredweight, and thus the lower his net income will be. By keeping stable the amount he ships, the producer can stabilize his average returns; and by shipping the exact amount of milk his quota requires he can maximize his average return in the short

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[21] "Government, Farm Organizations Critized by Dairy Farmer," The Chronicle Herald, October 4, 1974; "More Uniform Return for Labor," ibid., December 3, 1974.

run. Nonetheless, this policy would not be the most profitable in the long run, as it does not allow for farm expansion and quota enlargement.

## INCOME ADEQUACY

The adequacy of producer income is one of the main issues of the dairy industry, as in any of the regulated agricultural sectors. In general, incomes in the farming sector of Nova Scotia have been historically low, and in the dairying sector only the few most efficient producers have in the past been able to cover costs. Those producers below the efficient scale of operation have always had to hold down an additional job or go into mixed farming. Since 1961 about 8,000 milk and cream producers have dropped out of the industry of Nova Scotia because of income inadequacy.[22] Even as recently as the early 1970's large commercial producers were considering leaving dairying for more profitable alternatives such as the raising of beef cattle and alarming reports about the squeeze producers were experiencing were being spread.[23]

The net producer income in Nova Scotia is estimated annually in the Nova Scotia Dairy Farm Business Summary. In this Summary income figures are obtained on a voluntary

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[22] See Table 2.

[23] The Chronicle Herald, various issues of 1974.

basis from about 10 percent of the dairy farmers in the province. This sample is not randomly chosen and hence any estimates based upon it cannot be guaranteed with any degree of accuracy to coincide with population parameters. The income estimates are, however, likely to be understated because of the fact that higher income level producers are less ready to reveal their income figures than are the smaller producers. These factors must be kept in mind when one looks at the income figures to be discussed. In spite of this, the Summary is the best source of dairy income and cost information available in Nova Scotia.

The Summary gives average income and cost information for farms of various herd size, investment levels and income ranges (see Appendix 5). Several measures of net income are presented: net cash income, net farm income, labor and management income, and labor earnings. Net farm income is defined as the difference between current income and current expenses with adjustment made for inventory change and depreciation. As Table 18 shows, this measure of net income has come close to doubling every five years up to 1976. Labor and management income is defined as the return attributable to operator labor after all expenses, namely current expenses, inventory change, depreciation, unpaid family labor and interest on net worth of the farm have been deducted from receipts. Labor

and management income has also shown steady growth over the past two decades.

Table 18

Returns in the Dairy Industry*

| Year | Net farm income ($/farm) | Labor and management income ($/farm) |
|---|---|---|
| 1960-61 | 3,487 | 2,162 |
| 1966 | 7,265 | 5,962 |
| 1971 | 12,852 | 8,178 |
| 1976 | 22,561 | 11,759 |

Source:

Nova Scotia Department of Agriculture and Marketing, Nova Scotia Dairy Farm Business Summary, 1960-61, 1966, 1971, 1976.

*For high-income caegory farms, or farms with 60+ cows after 1970.

According to the 1960-61 Summary neither of these measures of net income is suitable as a means of comparing farm and on-farm incomes. A more suitable measure, called labor earnings, is arrived at by adding to labor and management income the value of farm products consumed by the farm family. In 1961 this was 7.4 percent of farm milk production, valued at about $608., to give labor earnings of $2,770 for high-income-category farms. Today this amount of milk used for farm family consumption is

negligible, amounting to only 2.5 percent of farm milk production;[24] thus the estimate of farm income most comparable to non-farm income is labor and management income.

Using these estimates of producer income it is concluded that over the past five years returns have increased by 87 percent and costs 109 percent. In other words, the price of milk has increased about 56 percent and the cost of producing milk 57 percent, leaving a smaller net return per hundredweight in 1977 than in 1973. Furthermore, in every year over this time period the average net return per hundredweight of milk has been negative, as shown in Table 19. However, it must be remembered that these estimates are downward-biased, being based on low-income farms.

Table 19

Net Return* per Hundredweight of Milk

| Year | $/cwt. |
|---|---|
| 1973 | -.54 |
| 1974 | -.66 |
| 1975 | -.42 |
| 1976 | -.73 |
| 1977 | -.92 |

Source:

Nova Scotia Department of Agriculture and Marketing, Five Year Summary - Nova Scotia Dairy Farms, 1973-1977, 1978.

*Net return per cwt. is defined as the difference between the price of milk and all production costs, including operator labor, per cwt.

[24] See Table 5.

The trend in net income can likewise be observed using Table 20, which shows the Index of Dairy Farm Costs in Canada and the Nova Scotia Fluid Milk Producer Price Index for the past decade. The formula for deriving net income is $Y_{net} = TR - TC$. Using the Nova Scotia Dairy Farm Business Summary data based on 60+ - cow farms, we find that in 1971 the equation was solved in the following way:

$$Y_{net} = \$61,980 - \$54,059$$
$$Y_{net} = \$7,921$$

The total cost figure for 1971 is indexed at an annual average of 100.3. The receipt value is based on fluid milk sales only, although it is recognised that other sources provide income for producers. But milk sales account for 80 percent of the TR figure, and are thus the major determinant of receipts.[25] The value of milk sales is the product of milk price and quantity sold: $TR = P \cdot Q$. Table 20 indexes the price P in 1971 at 98.0. Annual sales Q have experienced some increase over the past decade, but will for now be ignored as a factor that would influence change in net income. We end up with the relationship:

$$Y_{net} = [P \cdot \bar{Q}) .8 + (R_0) .2] - TC = \$7,921,$$

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[25] See Appendix 5.

Table 20

Indices of Producer Prices and Costs

| Year | Quarter | Dairy cash input price index, Canada (1970-72 = 100) | Producer fluid milk price index, Nova Scotia (1971 = 100) |
|---|---|---|---|
| 1970 | 1 | 96.4 | 96.0 |
| | 2 | 97.3 | 96.0 |
| | 3 | 97.4 | 96.0 |
| | 4 | 98.4 | 96.0 |
| 1971 | 1 | 100.8 | 96.0 |
| | 2 | 101.0 | 96.0 |
| | 3 | 100.6 | 100.0 |
| | 4 | 99.2 | 100.0 |
| 1972 | 1 | 100.5 | 100.0 |
| | 2 | 101.7 | 100.0 |
| | 3 | 102.2 | 106.7 |
| | 4 | 104.5 | 106.7 |
| 1973 | 1 | 113.3 | 106.7 |
| | 2 | 119.4 | 112.6 |
| | 3 | 133.0 | 119.3 |
| | 4 | 136.3 | 133.1 |
| 1974 | 1 | 148.4 | 133.1 |
| | 2 | 152.2 | 147.2 |
| | 3 | 159.2 | 147.2 |
| | 4 | 167.9 | 160.4 |
| 1975 | 1 | 167.1 | 162.4 |
| | 2 | 167.2 | 162.4 |
| | 3 | 168.1 | 162.4 |
| | 4 | 168.2 | 174.4 |
| 1976 | 1 | 170.2 | 174.4 |
| | 2 | 171.0 | 174.4 |
| | 3 | 171.0 | 174.4 |
| | 4 | 172.5 | 176.1 |
| 1977 | 1 | 177.8 | 179.5 |
| | 2 | | 179.5 |
| | 3 | | 179.5 |
| | 4 | | 188.1 |

Source:

For Input Price Index - Canadian Dairy Commission, Annual Report, 1976-77; for Milk Price Index - calculated from N.S.D.C. milk prices.

where $R_0$ is receipts from other sources such as crop and cattle sales. In simpler form,

$$Y_{net} = P \cdot \overline{Q} - TC.$$

The relationship of the Indices of Price and Farm Cost will show the direction of change of net income. Between the second quarter of 1971 and the first quarter of 1977 the Farm Cost Index increased by 76.1 percent and the Milk Price Index by 83.5 percent. The greater percentage increase of prices indicates that net income in the industry has increased over the 1971 level of $7,921. If returns in the industry depended on milk sales alone net incomes would have been fairly low, milk prices having increased over total costs by only 7.4 percent over six years.

The fact that total receipts are made up of and depend on more than just milk prices has the effect of making net incomes much higher than the above analysis suggests. In the first place, milk sales Q have not remained unchanged over the period from 1971 to 1977; they have increased by 13 percent[26] and have had the effect of raising net incomes above what the indices indicate. Second, the $R_0$ component of total receipts has an important effect in raising net incomes. Receipts from other sources such as subsidies, crop and livestock sales and

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[26]Statistics Canada, Fluid Milk Sales, various issues.

miscellaneous sales make up 20 percent of the TR figure. Receipts from livestock sales, for example, are a fairly important source of income, since a producer milking 80 cows will have about as many calves that can be sold for beef at good prices each year. Since receipts from these other sources make up 20 percent of the TR figure of the average dairy farmer, they can effect an increase of 25 percent in the receipts gained from milk sales only, and for any given TC figure raise net income significantly.

Another way of estimating net incomes or profits in the industry is by observing quota prices. Profits are reflected by the price or value of fluid milk quotas in the province. The N.S.D.C. splits up the market for milk among producers by granting quotas. If the cartel, as such as organization is, is successful in bringing benefits or profits to its members through its pricing policies, it will be under pressure to accept new members. Or if the cartel is mature and will not accept new members, that is if the milk it supplies meets its market's demand, then its members will be trying to buy quotas from each other. This will put upward pressure on the price of quotas. The value of the fluid milk quota thus reflects to a degree the expected future flow of benefits to the producer; with such flow taking into account increases in the price of milk.

Quota Value/lb. milk = Producer Price/lb. milk -
Cost of Production/lb. milk.

Unfortunately the N.S.D.C. keeps no records of quota prices in Nova Scotia, as contrasted to the situations in Ontario and British Columbia, were quota prices are recorded; and while for the past few years quota prices have been regulated to remain at $16. per pound of milk in Ontario, quota values in Nova Scotia are unregulated, and their determination left to the buyer and seller of quota in any given situation. Because prices have not been excessive in Nova Scotia, the N.S.D.C. has seen no need to exert control over them. Quota values vary depending upon a) the processing plant to which they belong, b) market supply and demand for quotas, c) the interaction of M.S.Q. with provincial quotas, 3) the closeness of the time of a quota purchase to April 1, when annual quota revisions take place, 3) the season, and f) fluid milk prices. Since 1967 quota prices in Nova Scotia have ranged from a low of 50¢ to a high of $25. per pound of milk, and they have been rising over time.[27]

The fact that quotas have been increasing in value can be taken to indicate that profits from milk production have been good, as it asserts that a producer can pay

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[27]Personal correspondence with the N.S.D.C.

production costs, including whatever return he requires for labor, management and investment, and also pay the interest cost on funds paid to purchase his quota. This interest cost of a quota equates the income transfer or monopoly rents that producers receive from dairying operations.

Although quota values do indicate the presence of profits in an industry, it is a pertinent issue as to whether producers actually receive profits as high as the quota value indicates, since benefits from the future income stream promised by a quota tend to become capitalized into quota prices in systems such as that of Nova Scotia, in which quotas are allowed to take on value. Since in buying quota a producer is actually investing the same amount, heavily discounted for uncertainty, that he expects to gain from the quota, he will not actually reap benefits from it unless he holds it for a longer period of time than he expected to when he purchased it, or until he sells it. Dairy farmers who were in business when the quotas where first allocated free of charge by processing plants and those who gain quota every year when quota is reallocated on April 1, or when plants expand production and give away quota reap the full benefits from a quota since their cost of obtaining it is zero. Other farmers who enter dairying or expand their operations by buying quota would normally reap lower benefits, assuming their costs of production approximate the average level for the industry.

In summary, it can be concluded that the net income of milk producers in Nova Scotia is at a fairly adequate level. Both agricultural representatives in the dairy sector and dairy farmers themselves admit that real incomes in the industry are substantially higher and that producers are today better off than in previous decades. Dairying is now said by some producers to be the second or third most profitable sector of Nova Scotian agriculture.[28]

## INDUSTRY EFFICIENCY

The improvement of economic efficiency in the dairy industry is a major concern of the N.S.D.C. This is necessary in order to make a major and permanent improvement in producer returns and at the same time to keep consumer prices from rising. In some ways regulation can be said to hinder efficient operation, while in others it has helped improve it.

It has been argued by many that one of the major hindrances to the attainment of operative efficiency in the dairy industry is its supply regulation through milk production quotas.[29] The quota system places restrictions on how much milk a producer may sell each day; to the extent

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[28] Personal contact with dairy representatives and farmers.

[29] Broadwith et al., The Ontario Milk Marketing Board: An Economic Analysis," Government Regulation (Toronto: Ontario Economic Council, 1978),pp. 89, 91-93.

that production is restrained in any operation, excess capacity is created, and production costs per unit of output increase. This inefficiency can only be overcome in the long run when enough small producers leave the industry to allow remaining producers to gain as much quota as they need to operate close to full capacity, or when enough demand is generated for milk products to allow supply to rise until all production capacity is in use.

Inefficiency is also created by the tendency of quotas to maintain a given uneconomic distribution of production rights and inefficient scales of farm size. In order for a producer with excess capacity or an inefficient scale of opeation to attain efficiency, he must buy additional quota: this is only possible if (a) some producer is leaving the industry and selling quota, (b) if he can obtain some quota on April 1 when it is reallocated, or (c) if there is excess demand in the industry and processors are ready to enlarge their shippers' quotas. Even if these conditions exist, the producer is limited in his ability to expand substantially by the price of quota. The higher quota prices are, the greater the hindrance to a more efficient reallocation of producing rights in the industry. In reality, quota restrictions on efficiency are not nearly so large in Nova Scotia as they are in some other provinces of Canada which are much more highly regulated in the area of quotas. The quota system in Nova

Scotia is relatively flexible and free from regulatory complications.

Another source of inefficiency is government subsidy and support programs for the dairy industry. The federal subsidy of $2.66 and the provincial subsidy of $1.50 per hundredweight on manufacturing milk, along with federal support and offer-to-purchase programs for manufacturing milk protect the typically small, high-cost cream producers in the industry and keep average costs higher than necessary. Further inefficiency is also created through the complexity of administration necessary to maintain these various programs.

The N.S.D.C. has attempted to increase the operative efficiency of the dairy industry. One of the programs it instituted in 1968 was the Dairy Herd Analysis Service (D.H.A.S.). It is basically a management program whereby a producer who joins it keeps detailed records on the production, breeding, milk quality and feeding habits of each cow in his herd. A supervisor employed by the Department of Agriculture and Marketing does monthly tests on milk samples of each cow enlisted and thereby can recommend to the farmer the exact feed requirements for each cow in order that the milk production of each can be maximized and feed be more economically used. Through the keeping of accurate records a higher percentage of the herd can be milked at once.

This program had 8,200 cows enlisted in it by June 1978, and has been effective in increasing production by an average of 1,500 pounds per cow since 1968[30] and by an average of 5,000 pounds per herd in the last three years.[31] Moreover, it has decreased feed costs per hundredweight, thus raising the efficiency of milk production and increasing returns by up to 35 percent.[32]

## CONSUMER PRICE

Another objective of the N.S.D.C. is to make milk available to the consumer at a reasonable price. The Board of Commissioners of Public Utilities was a consumer-protective agency which fixed maximum retail prices designed to protect the consumer. The N.S.D.C., on the other hand, is structured to deal with industry problems, and its consumer prices are minimum limits meant to protect the producer and processor from losing their returns, since in the long run downward pressure on retail milk prices would work its way back to the primary level (see Table 21).

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[30]"Provincial Farmers Making Full Use of New Milk Testing Program," The Chronicle Herald, June 10, 1978.

[31]Nova Scotia Department of Agriculture and Marketing, D.H.A.S., pamphlet.

[32]"Dairy Industry Worries Consumers Group," The Chronicle Herald, December 11, 1974.

Table 21

Consumer Milk Prices in Controlled Areas, 1968-1977 (¢ per. quart)

| | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 |
|---|---|---|---|---|---|---|---|---|---|---|
| Nova Scotia mainland | 29¢ | 32 | 32 | 34[o] | 36[x] | 39[a] | 51[b] | 58[c] | 61[d] | 65[e] |
| Cape Breton Island | 30¢ | 33 | 33 | 34[o] | 37[x] | 40[a] | 52[b] | 59[c] | 62[d] | 66[e] |

[o]Effective July 1, 1971

[x]Effective August 1, 1972

[a]April 1 - 39¢; August 1 - 41¢; October 1 - 44¢. Price on October 1 rolled back to 39¢ pursuant to Federal-Provincial Fluid Milk subsidy agreement. Cape Breton prices 1¢ higher.

[b]April 15 - 43¢; October 1 - 48¢; December 1 - 51¢. These changes included a 1¢ and 2¢ removal of the Federal subsidy. Cape Breton prices 1¢ higher.

[c]January 1 - 53¢; October 1 - 58¢.

[d]Effective December 1, 1976.

[e]October 1, 1977.

Source:

Personal correspondence with the N.S.D.C.

Nevertheless the N.S.D.C. is definitely concerned about keeping consumer prices reasonable. The Milk Industry Inquiry Committee that planned the setting up of the N.S.D.C. stated that "producer demand for a fair rate of return should be tempered by the fact that the public cannot be expected to pay a cost-plus price,"[33] and recommended that consumer prices be permitted to find their own level in open market transactions with only a restriction of a price floor during the first few years of the N.S.D.C.'s existence. So far the maintenance of this price floor has not allowed for absolute minimization of consumer prices.

Consumer interests are protected to a degree by the composition of the N.S.D.C. itself. It is made up of five members, two of whom represent the industry and three of whom represent the consumer. Thus, while the industry has a full voice in regulations and pricing decisions, the consumer is equipped with offsetting power to give him some assurance of protection.

One evidence of the agency's concern about consumer price minimization is its frequent refusal to concede to producer price demands in the past. The local newspapers attest to many demand by producers for higher prices that

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[33] Report of the Milk Industry Inquiry Committee, 1966-67, p. 67.

were refused by the N.S.D.C. on the basis that it was reluctant to see consumer prices rise. The industry's experience of 1964, when in response to an increase in consumer prices the demand for milk fell substantially and could hardly be recovered through a corrective decrease in prices, is constantly borne in mind. The recurrance of such a situation would not be beneficial to the industry.

However, one tool of the N.S.D.C. to raise net incomes of producers is the raising of milk prices above the free market level. Although it is impossible to quantify precisely the competitive equilibrium level, the present level of consumer prices appears to be above that level. This conclusion can be inferred from the dispute over consumer prices in 1972, when three Halifax-Dartmouth food chain stores sold various-sized containers of milk at prices 1¢ to 3¢ below the stated minimum prices set by the N.S.D.C. and were ordered under threat of prosecution to conform to price limits.[34] The N.S.D.C.'s policy has thus been to minimize consumer prices under the restraints of producer net income objectives.

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[34] The Chronicle Herald, September 15, 1972, and various other issues.

# Chapter 5

## CONCLUSIONS

In this chapter an attempt is made to draw some conclusions from the preceding chapters, which examined the changing structure of the dairy industry at the primary or producer level and the impact of the creation of the Nova Scotia Dairy Commission on the industry.

A number of findings from both the producer and consumer sectors of the industry are indicated, followed by comments as to their implications. Some of the major findings from the primary producers' sector are:

1. Under the administration of the N.S.D.C. seasonal instability in milk prices has been eliminated. The frequency of the occurrence of price changes has been minimized, with the N.S.D.C.'s record of thirteen price changes within a period of ten years, from 1968 to 1978, being comparable to that of the Ontario Milk Marketing Board's excellent record of eleven price changes between 1967 and 1977.[35] However, when assessed in terms of the magnitude of the price changes instability has increased,

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[35]Broadwith et al., "The Ontario Milk Marketing Board: An Economic Analysis," Ontario Economic Council, Government Regulation, Toronto, 1978, p. 75.

with an average annual change in the milk price index of 10.98 percent occurring between 1968 and 1978, compared to the average of 2.07 percent between 1961 and 1967. At the same time the general food price index changed by an annual average of 9.53 percent between 1968 and 1978, compared to an average of 2.3 percent between 1961 and 1967.

2. Although it is impossible to quantify precisely how the N.S.D.C. has contributed to price stability, nevertheless the demand and supply characteristics of the fluid milk market suggest than an unregulated market would result in less price stability. The N.S.D.C. has also succeeded in raising the prices paid to producers for milk to a more adequate level relative to the prices of other food products in the economy. Prior to 1968 the food price index was an average 11.5 percent higher than the fluid milk price index, but following the establishment of the N.S.D.C. in 1967 and through its pricing policy for producers, the difference between the food and milk price indices was eliminated, and since 1973 the milk price index has increased more rapidly than the food price index.

3. Since 1968 the net incomes of producers have to a degree become more stable due to the increased stability of producer prices, and incomes are now at a level which permits dairying to be a profitable enterprise

for given minimum-sized farms. An "artificially" high milk price, that is, a price above that which would be derived from a competitive model, set at a level to cover input costs per hundredweight has been the main tool of the N.S.D.C. to raise net incomes.

4. As a regulatory body, the N.S.D.C. has not been able to succeed fully in bringing about maximum efficiency at the primary level. Its pricing policy for milk, subsidy, combined with the federal support programs, and the provincial quota system all encourage less efficient farms to continue to participate in production. However, in spite of these structure inefficiencies, the N.S.D.C. has effected an increase in productivity through such programs as the Dairy Herd Analysis Sytem.

Regarding the price of milk as it pertains to consumers , the concept of the maintenance of a competitive price was not one of the primary objectives in the creation of the N.S.D.C. Rather this was considered a secondary goal subject to the condition that a reasonable price of dairy products should be accorded to consumers. The evidence shows that consumer milk prices have thus risen faster than the index of other food prices since the inception of the N.S.D.C. With 1971 taken as a base year, consumer milk prices and food price indices were 188.1 and 178.6 respectively in 1977.

Turning now to discuss the structure of the Nova Scotia dairy industry, it has been observed that considerable changes have occurred over the past few decades. The total number of farmers producing milk decreased drastically from 19,000 to 2,000 between 1951 and 1976. This decrease in the number of milk producers has been accompanied by greater specialization in dairying and an increase in the minimum economic size of farms from 12 cows in 1951 to 60 cows at the present time. Productivity of dairying in terms of production of milk per cow has increased steadily from an average of 3,400 pounds per year in 1921 to 6,600 pounds in 1966, 7,900 pounds in 1971 and 9,200 pounds in 1976. These figures compare favorably with productivity levels in Ontario and Quebec, the main milk-producing provinces in Canada. The Nova Scotia production per cow of 7,900 pounds for 1971 was higher than that of Quebec (7,000 pounds) but lower than that of Ontario (9,000 pounds).[36] The greatest increase in productivity has occurred since the establishment of the N.S. D.C. Between 1921 and 1966 productivity increased by an average of 10 percent every five years, but between 1966 and 1976 it increased by 20 percent every five years. The consolidation of farms and increase in productivity

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[36] L. Auer, Regional Disparities of Productivity and Growth in Canada, Economic Council of Canada, 1979, p. 98.

has been effective in raising profits in the industry. It must be pointed out that for the most productive farms whose herds are registered under the Dairy Herd Analysis System, the average output per cow for 1977 was estimated to be 16,500 pounds.

Further improvements in productivity for the primary sector may be indirectly constrained by the recent trend whereby the majority of new owners of dairy farms in the main milk-producing areas of the province are under forty years of age. In the absence of expansion of the market for milk this ownership structure will likely advocate that the N.S.D.C. pursue a policy through which their farm incomes will remain adequate. Thus it is likely that prices in the near future will continue to adjust at an annual rate not too dissimilar from that experienced over the last few years.

One alternative which the N.S.D.C. may have to consider is to set the magnitude of future price changes at a level which would not cover the costs of the less efficient producers. This would, however, be a fundamental shift from current policy, and if enacted would lead to increased concentration at the producer level.

Although the results of the regression analysis carried out in Chapter 3 theoretically suggest that with a price elasticity of .09 for fluid milk, prices can be raised substantially without a comparable percentage decline

in quantity demanded by consumers, it is not evident that in reality such would be the case. In fact, per capita consumption of milk in Canada has been declining over the past few decades, and competition from milk substitutes such as margerine, synthetic cheese spreads, frozen desserts, and coffee whiteners as well as from cheaper dairy products such as skim milk powder has begun to threaten the market for fluid milk.

In the secondary sector, profits over the past decades have been fairly low and in many cases when plant equipment has worn out dairies have gone out of business because of the high cost of capital replacement; however, margins are higher than those in the U.S. Konecny and Thompson found that there are massive economies of scale existing in the manufacture of cheese, butter and milk powder, and while the number of processing plants in Nova Scotia has been declining and the average size of remaining plants has been increasing, the industry nevertheless remains one of economic inefficiency.[37]

The processing sector consists of four different markets for raw milk, each with its own price for milk, with the fluid milk or Class I market being predominant

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[37]M. F. Konecny and S. C. Thompson, "Margins in the Dairy Processing Industry," Canadian Farm Economics, XIII, 6 (December, 1978), 7-14.

in Nova Scotia. Due to the C.D.C.'s policy to reduce the Market-Sharing Quota entitlements to the provinces of Canada, it is foreseen that the manufacturing milk sector of the industry will in the near future decrease in importance to the Nova Scotia dairy industry. The existence of several different markets for milk in the secondary sector has been the cause of some instability in returns in both the producing and processing sectors. It has been suggested by other studies that a one-price system be adopted for all milk, especially as the quality standards for the various types of milk are today almost the same.

In order to eliminate most of the inefficiencies that exist in the primary sector of the dairy industry, support prices, offer-to-purchase programs and subsidies would have to be removed. The Task Force report of 1969 recommended limited government involvement in agriculture in areas of support prices, subsidies and similar legislation.[38] The enactment of such a policy would likely have adverse short-term economic consequences for some milk producers in the province. Perhaps it would be better if subsidies replaced support prices as direct income supplements to milk producers so that milk prices in the

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[38]The Federal Task Force on Agriculture, Canadian Agriculture in the Seventies, Report of the Federal Task Force on Agriculture (Ottawa: Queen's Printer, 1969).

market would be able to remain at a competitive level to ensure that demand would not drop. However, this policy involving direct subsidies would be more expensive to the government than that of the imposition of support prices, as explained in Chapter 3.

With a reduction in government programs it is likely that manufacturing prices would either fall or remain stable at a given level. This would lead to the exit of small milk producers from the industry, and the acquisition by larger producers of the slack in milk production; thus enabling the remaining producers to produce nearer to full capacity and on a more efficient scale.

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# APPENDICES

Appendix Table 1

Dairy Farms per County, Nova Scotia, 1976*

| County | Number of cows | Pounds of milk produced in one day | Number of farms | Average number of cows/ farm | Average milk production per cow/ day |
|---|---|---|---|---|---|
| Annapolis | 2,628 | 115,300 | 77 | 34 | 43.87 |
| Antigonish | 2,351 | 93,381 | 72 | 33 | 39.72 |
| Cape Breton | 728 | 26,937 | 36 | 20 | 37.00 |
| Colchester | 5,024 | 205,589 | 166 | 30 | 40.52 |
| Cumberland | 1,868 | 71,965 | 100 | 19 | 38.53 |
| Digby | 55 | 2,148 | 4 | 14 | 39.05 |
| Guysborough | 156 | 5,660 | 6 | 26 | 26.28 |
| Halifax | 1,494 | 58,865 | 74 | 20 | 39.40 |
| Hants | 4,101 | 177,217 | 120 | 34 | 43.21 |
| Inverness | 1,095 | 40,723 | 37 | 30 | 37.19 |
| Kings | 3,288 | 140,220 | 108 | 30 | 42.65 |
| Lunenburg | 919 | 34,311 | 59 | 15 | 37.34 |
| Pictou | 2,047 | 74,339 | 99 | 21 | 36.32 |
| Queens | 42 | 869 | 2 | 21 | 20.70 |
| Richmond | 90 | 2,953 | 3 | 30 | 32.81 |
| Shelburne | 7 | 97 | 0 | -- | 13.86 |
| Victoria | 200 | 6,383 | 11 | 18 | 31.92 |
| Yarmouth | 745 | 29,385 | 28 | 27 | 39.44 |

Source:

Statistics Canada, 1976 Census of Canada, Vol. 11.

*Farms with sales of $1200 plus per year from milk.

Appendix Table 2

Dairy Processing Establishments in Nova Scotia, 1977

| Name of company and plants | Location | Year established | Number employed 1977 |
|---|---|---|---|
| Baxter Dairies Limited | Dartmouth | 1976 | 52 |
| Brookfield Foods Limited (owned by Scotsburn Co-op Services Ltd. Plants: | 1) Truro | 1915 | 110 |
| | 2) Amherst | 1925 | 65 |
| Eastern Dairy Foods Co-operative Ltd. Plants: | 1) Antigonish | 1965 | 72 |
| 2) Cape Breton Dairymen's Co-op Society Ltd. | Sydney | 1937 | 30 |
| 3) Modern City Dairy Ltd. | Sydney | 1938 | 75 |
| Coates', Fletcher Dairy Ltd. | Amherst | 1959 | 5 |
| Cook's Dairy Farm Ltd. | Arcadia | 1956 | 25 |
| Cornwallis Dairy Ltd. | Kentville | 1936 | 30 |
| Peninsula Farm | Lunenburg | 1976 | 3 |
| Scotsburn Co-operative Services Ltd. Plants: | 1) Scotsburn | 1900 | 65 |
| | 2) Stellarton | 1966 | 50 |
| | 3) Truro | 1972 | 110 |
| | 4) Amherst | 1972 | 60 |
| | 5) Tatamagouche | 1968 | 40 |
| Twin Cities Co-operative Dairy Ltd. Plants: | 1) Hammonds Plains | 1975 | 150 |
| | 2) Middleton | 1968 | 32 |

Appendix Table 2 (cont'd)

| Name of company and plants | Location | Year established | Number employed 1977 |
|---|---|---|---|
| 3) Producers Milk Products Ltd. | Salmon River | 1966 | 45 |

Source:

Nova Scotia Directory of Manufacturers 1977-1978.

Appendix Table 3

Method of Payment to Producers for Milk Supplied

Total pounds of milk received at the dairy for the month - 185,000.

UTILIZATION - Class I 140,000 lbs. @ $14.11/cwt = $19,754.00
Class II 45,000 lbs. @ $ 9.45/cwt = 4,252.50
185,000 $24,006.50

| PRODUCER | LBS. SHIPPED | LBS. QUOTA | LOWER OF SHIPMENT/QUOTA | 80% - CLASS I PAYMENT | CLASS II PAYMENT |
|---|---|---|---|---|---|
| A | 35,000 | 25,000 | 25,000 | 20,000 | 15,000 |
| B | 60,000 | 60,000 | 60,000 | 48,000 | 12,000 |
| C | 90,000 | 95,000 | 90,000 | 72,000 | 18,000 |
| | 185,000 | 180,000 | 175,000 | 140,000 | 45,000 |

Class I Requirements

Lower of shipment or quota $\frac{140,000}{175,000} \times 100 = 80\%$

PRODUCER A: Received 20,000 lbs. @ $14.11 = $2,822.00
15,000 lbs. @ 9.45 = 1,417.50
35,000 $4,239.50 ($12.11/cwt)

PRODUCER B: Received 48,000 lbs. @ $14.11 = $6,772.80
12,000 lbs. @ 9.45 = 1,134.00
60,000 $7,906.80 ($13.18/cwt)

Appendix Table 3 (cont'd)

| | | | | | |
|---|---|---|---|---|---|
| PRODUCER C: | Received | 72,000 lbs. @ | $14.11 = | $10,159.20 | |
| | | 18,000 lbs. @ | 9.45 = | 1,701.00 | |
| | | 90,000 | | $11,860.20 | ($13.18/cwt) |

Total payment to three producers = $24,006.50

If Class I payment had been on a straight percent of shipment, then the fluid share would have been:

| | |
|---|---|
| A = | $ 26,486 |
| B = | 45,402 |
| C = | 68,112 |
| | $140,000 |

Source:

Personal correspondence with the Nova Scotia Dairy Commission.

Appendix Table 4

OMMB Fluid Milk Pricing Formula

| Factor | Relative weight |
|---|---|
| Farm input price index | .20 |
| Feed price index | .10 |
| Average weekly earnings | .15 |
| General wholesale price index | .30 |
| Fulid milk sales as % of total milkes sales | .25 |
| | 1.00 |

Source:

Ontario Milk Marketing Board.

The first two factors represent production costs; the farm input price index is a proxy for a wide range of production costs, and the feed price index is a proxy for feed costs. Average weekly earings are indcluded partly as a proxy for consumers' "ability to pay." However, this economic indicator can be expected to move in a manner similar to labour costs, including the opportunity cost of producers' own labour.

Appendix Table 5

Income and Cost Figures for 60+-Cows Category Farms in Nova Scotia

A. INCOME

Receipts from milk sales and milk subsidies represents 89.3 percent of current farm income for the 60+-cow group. Miscellaneous sales accounted for 5.7 percent followed by livestock sales at 4.2 percent and crop sales at 0.8 percent.

Total Current Farm Income was $153,462.00 per farm or $1,650.00 per cow.

Table A

| Item | Per Farm | Per Cow |
|---|---|---|
| Milk sales | $126,541. | $1,361. |
| Milk subsidies | 10,569. | 114. |
| Livestock sales | 6,400. | 69. |
| Crop sales | 1,166. | 13. |
| Miscellaneous | 8,786. | 94. |
| Total Current Farm Income | $153,462. | $1,650. |

B. EXPENSES

Purchased dairy feed accounted for the largest cost item at 39.7 percent of total current farm expenses. Other major items of expense were hired labor at 8.2 percent, crop expenses at 7.8 percent, interest at 7.7 percent and miscellaneous at 6.2 percent.

Total Current Farm Expenses amounted to $120,483.00 per farm or $1,296.00 on a per cow basis.

Table B

| Item | Per Farm | Per Cow |
|---|---|---|
| Dairy feed | $ 47,816. | $ 514. |
| Livestock purchased | 6,119. | 66. |
| Milk hauling | 4,682. | 50. |
| Milk marketing costs | 4,551. | 49. |

Appendix Table 5 (cont'd)

| Item | Per Farm | Per Cow |
|---|---|---|
| Dairy supplies | 2,218. | 24. |
| Vet and drugs | 955. | 10. |
| Breeding | 933. | 10. |
| Crop expenses | 9,395. | 101. |
| Tractor and machinery expenses | 5,770. | 62. |
| Truck and auto expenses | 2,654. | 29. |
| Building and fence reparis | 3,234. | 35. |
| Utilities | 2,641. | 28. |
| Taxes | 871. | 9. |
| Hired labor | 9,858. | 106. |
| Interest | 9,264. | 100. |
| Insurance | 1,982. | 21. |
| Miscellaneous | 7,539. | 81. |
| Total Current Farm Expenses | $120,483. | $1,296. |

C. INCOME SUMMARY

Different measures of income are often used when analysing a farm business. In this section of the summary, a number of these measures of income are calculated.

Net Cash Income is the difference between current income and current expenses.

Net Farm Income is the difference between current income and current expenses with adjustments made for inventory change and depreciation. Net Farm Income for the 60 plus cow group was $15,107.00 per farm or $162.00 per cow.

Labor and Management Income is the return to operator labor after all expenses have been deducted. All expenses, by our definition, includes: current expenses, depreciation, inventory change, unapid family labor and interest on net worth. Labor and Management Income for this group was $7,134.00 per farm or $76.00 per cow.

Appendix Table 5 (cont'd)

Table C

| Item | Per Farm | Per Cow |
|---|---|---|
| Total Current Farm Income | $153,462. | $1,650. |
| Total Current Farm Expenses | 120,483. | 1,296. |
| Net Cash Income | $ 32,979. | $ 354. |
| Plus: Inventory Change | 3,466. | 37. |
| Less: Depreciation | 21,338. | 229. |
| Net Farm Income | $ 15,107. | $ 162. |
| Less: Value of unapid family labor | 749. | 8. |
| Interest on Net Worth @ 9% | 7,224. | 78. |
| LABOR AND MANAGEMENT INCOME | $ 7,134. | $ 76. |

D. NET COST OF PRODUCTION

The net cost of producing milk averaged $130,504.00 per farm or $1,404.00 per cow. On a per hundredweight of milk basis, the net cost was $12.19 for this group. The return from selling milk averaged $11.82 per hundredweight giving a net loss of $0.37 per hundredweight. All costs, including operator labor have been included in the cost calculations. If operator labor was not included, then the net cost would be $11.16 per hundredweight giving a net margin of $0.66 per hundredweight--the return to operator labor and management.

Table D

| Item | Per Farm | Per Cow |
|---|---|---|
| Total Current Expenses | $120,483. | $1,296. |
| Plus: Depreciation | 21,338. | 229. |
| Inventory Change | -3,466. | -37. |
| Interst on Net Worth @ 9% | 7,224. | 78. |
| Value of unpaid family labor | 749. | 8. |
| Operator labor | 11,097. | 119. |
| Total Farm Cost | $157,425. | $1,693. |
| Less: Sales (excl. milk) | -26,921. | -289. |
| Net Cost of Producing Milk | $130,504. | $1,404. |

Appendix Table 5 (cont'd)

| Item | Per Farm | Per Cow |
|---|---|---|
| Number of cows | 93 | 1 |
| Total pounds of milk (lbs.) | 1,069,750 | 11,503 |
| Price of milk per cwt. ($) | 11.82 | 11.82 |
| Cost of producing milk per cwt. ($) | 12.19 | 12.19 |
| Net return per cwt. ($) | -0.37 | -0.37 |

Source:

Nova Scotia Dairy Farm Business Summary, 1977.