Agriculture
Canada

# ORIENTATION OF CANADIAN AGRICULTURE

## A TASK FORCE REPORT

*A Review of the Canadian Agriculture and Food Complex —the System*

Volume I
Part A

1977

CANADA DEPARTMENT
OF AGRICULTURE

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# FOREWORD

The Task Force on the Orientation of Canadian Agriculture was set up by the Senior Management Committee of Agriculture Canada with the following terms of reference: to describe Canadian agriculture and its evolution since 1950; to examine federal agricultural policies and programs; and to propose alternative planning options for agriculture consistent with national objectives.

Members of the Steering Committee were: B.B. Migicovsky, Chairman; D.G. Hamilton; M.J. Heney; A.E. Hannah; J.E. McGowan; and G.I. Trant.

Members of the Task Force were: W.S. Ferguson and W.J. Anderson, Co-Chairmen; C.J. Bishop; C.D. Caldwell; A.S. Johnson; and W.H. Leggett.

We wish to pay special tribute to the contribution of Dr. W.S. Ferguson whose untimely death occured part way through the process of preparation of these reports. Dr. Ferguson served as Co-Chairman of the Task Force and made a major contribution both to the background philosophy and organization of the study. In particular, the review of the agricultural resources of the country and the production potential from their efficient use attracted his attention. The sections on these topics reflect many of his ideas. As they were still unfinished at the time of his death, others have had to carry them forward, but his competent leadership in these areas remains evident. Dr. Ferguson was keenly interested in the whole project and its implications for future planning of the industry, and his sincere dedication to the development and preparation of the reports is gratefully acknowledged.

Volume I of the report contains 21 chapters which describe Canadian agriculture and changes that have taken place since 1950. Chapters 1 to 9 cover production and market structure, resources, input supply system, institutional services and domestic food utilization. The material in chapters 10 to 21 is concerned with commodity groups; these chapters, therefore, contain a more detailed description of the situation with respect to livestock and crops.

Volume II contains an analysis of the goals, programs, instruments and performance indicators of Canadian agricultural policy.

Volume III includes five sections which examine:

(1) broad scenarios of the future demand for and supply of Canadian agricultural products;

(2) the case for maximizing agricultural production;

(3) instability in Canadian agriculture;

(4) a family-farm oriented agriculture; and

(5) various economic instruments which have been used or proposed to manage agricultural supply and demand.

Volume IV has been written for Senior Management. It contains summaries of Volumes I, II and III and the conclusions of the Task Force.

The authors of the papers in Volumes I, II and III are listed in each Volume. With the exception of (5) Volume III, the papers were prepared by officials of Agriculture Canada. Ms. Lucie Larose edited all the manuscripts, supervised the final typing and preparation of the charts and made the arrangements for printing. These tasks involved many hours of painstaking work, which the Steering Committee and Task Force gratefully acknowledge. Special thanks are also due to Dr. W. Pigden for his help and advice in preparing the papers on animal products and the supply scenarios.

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# 1. INTRODUCTION

## 1.1 CANADA'S AGRICULTURE AND FOOD SYSTEM

The production of food and fibre involves the functioning of many economically interdependent business organizations which employ various mixes of labour, materials, capital and technology, and are engaged in activities which include farming, supplying factor inputs, processing, marketing and retailing. Because Canada's climate and resources favor the production of some commodities much more than others, international trade in agricultural products is a large component of the food system. Food exports contribute substantially to the balance of payments and the revenue from exports is particularly significant to the economy of Western Canada. Imported products, which supply consumers with those foods which cannot be produced economically in Canada, are a substantial item in the national food budget.

In 1976, the gross value of Canadian farm production amounted to $11.3 billion. In the production process, farmers utilized a capital stock (land, buildings, machinery and livestock) valued at $48.8 billion, a labour force of 474 thousand persons and purchased inputs in the amount of $6.2 billion. At the other end of the system, consumers purchased food and non-alcoholic beverages in the amount of $22.5 billion, agricultural exports brought in revenue of $4.1 billion, and $3.3 billion was paid for food imports. Figure 1.1 is a schematic view of the Canadian food system.

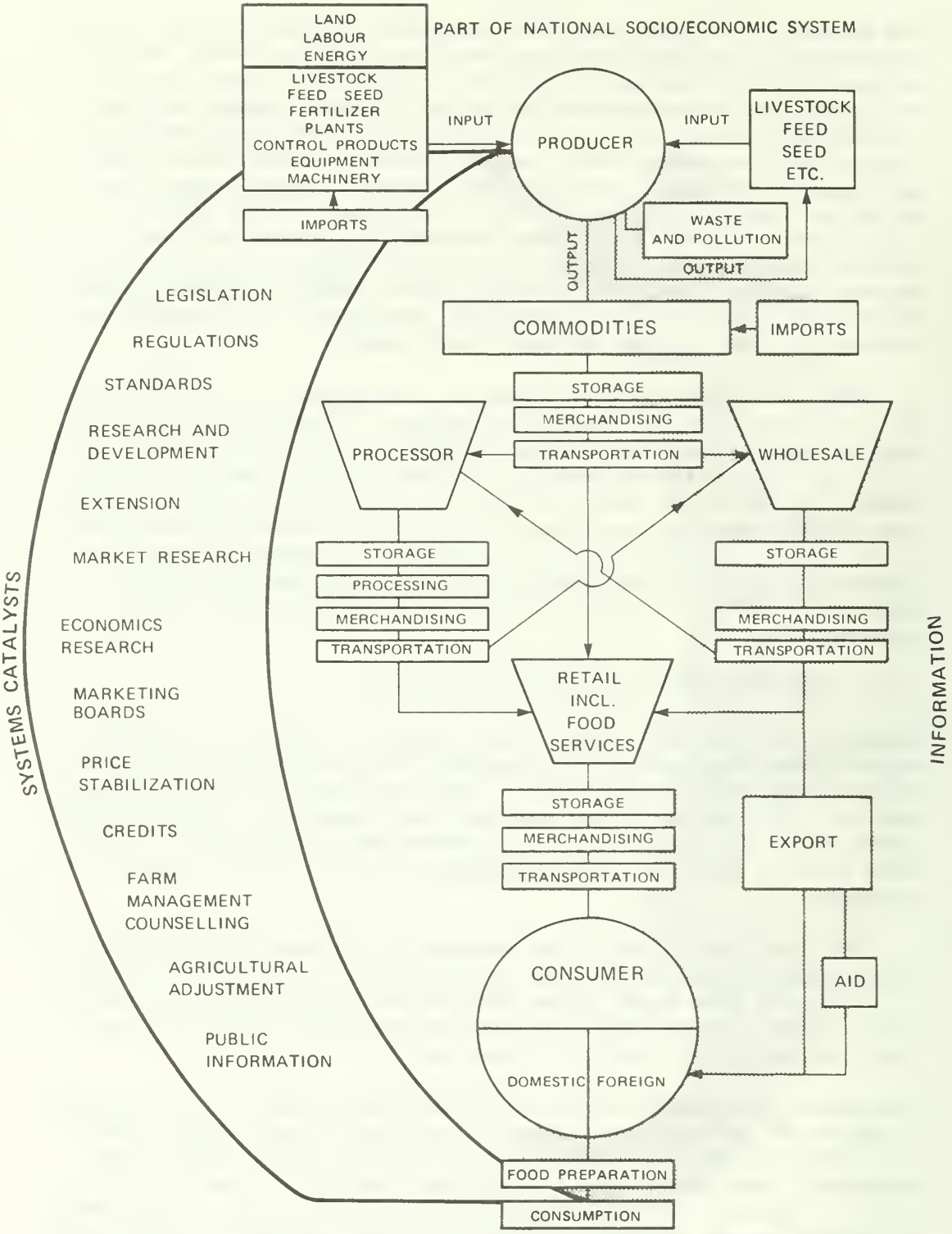
## 1.2 THE FARM SECTOR ON A NATIONAL BASIS

According to the 1976 census, the production sector of Canadian agriculture consisted of 339 thousand farm holdings, of which 39 thousand had sales under $1200. The total area of farm holdings was 68.4 million hectares; improved land amounted to 44.2 million hectares of which 43.7 million hectares were in farms with sales over $1200. The farm sector employed a total of 474 thousand persons.

In 1951, the farm labor force numbered 939 thousand persons which represented 18 percent of the total employed Canadian labor force; by 1976, the farm labor force represented 5 percent of the total labor force. Since 1966, the size of the farm labor force has been declining by a yearly average rate of 1.3 percent.

Throughout the period since 1951, farm output has been increasing in spite of the declining size of the labor force. This growth has been achieved in large measure by substituting capital for manpower. Purchased inputs other than land and labour grew from about 38 percent of total farm inputs in 1961, to over 50 percent in recent years. During the 1971-76 period, farmers' expenditures on machinery and equipment, livestock, seed and nursery stock, feed and fertilizer increased at the rate of 15, 10, 23, 18 and 26 percent per year, respectively. In 1976, Canadian farmers spent $1.4 billion on farm machinery, $485 million on fertilizer and $1.2 billion on feed. In that year, the total value of farm capital in Canada was estimated to be about $163 thousand per farm; taxes on farm land and buildings totaled $227 million.

FIGURE 1.1 **THE CANADIAN FOOD SYSTEM**




Note: 1. The flow chart illustrates the interlocking of major systems elements.

2. The circle infers that Systems agents (i.e. Research and Development) permeate the entire system and act as catalysts.

The fact that agricultural output in Canada has been increasing by using an ever-smaller labor force, has contributed significantly to the growth of national labor productivity. For all industries in Canada, the average annual change in labor productivity from 1946 to 1974 has been 4.2 percent. Among the four broad industrial groups, i.e., agriculture, manufacturing, commercial goods producing (excluding agriculture and manufacturing), and commercial service-producing, the average annual change in labor productivity in agriculture has been the highest of any at 5.5 percent.

Agriculture also affects significantly other sectors of the Canadian economy. In transportation, about 14 percent of total freight is comprised of farm products, and approximately 38 percent of the tonnage moved through the St. Lawrence Seaway in 1976 was agricultural commodities. Farm expenditures on fuel and lubricants amount to about 17 percent of the total sales of motor fuels. In wholesale trade, almost 25 percent of the employment is associated with the sales of farm and food products or farm supplies.

Wheat and wheat flour represented over one-half of Canadian agricultural exports which totalled $4.1 billion in 1976 and were 11 percent of total merchandise exports. In 1951, agricultural exports of $1.0 billion were 26 percent of Canada's total inter national merchandise exports. Since 1951, exports of farm products have always exceeded the value of agricultural import which, in 1976, were $3.3 billion or 9 percent of total merchandise imports.

Agriculture's relative position in the Canadian economy has declined during the post-war period. In 1955, agriculture contributed approximately 7 percent of the Gross Domestic Product and ranked fifth among fifteen industries; in 1975, agriculture contributed 4 percent and ranked tenth. Among the five primary industries, agriculture ranked first in 1955 and second in 1975 (Table 1.1).

Table 1.1 GROSS DOMESTIC PRODUCT OF FIVE PRIMARY INDUSTRIES, CANADA, 1955 AND 1975

| Industry | 1955 | | 1975 | |
|---|---|---|---|---|
| | $000,000 | % of total | $000,000 | % of total |
| Agriculture | 1,767 | 43.9 | 5,929 | 39.0 |
| Forestry | 438 | 10.9 | 1,035 | 6.8 |
| Fisheries & Trapping | 85 | 2.1 | 190 | 1.3 |
| Mining | 1,071 | 26.6 | 6,227 | 41.0 |
| Utilities | 664 | 16.5 | 1,813 | 11.9 |
| Total | 4,025 | 100.0 | 15,194 | 100.0 |

Source: Statistics Canada, Cat. 13-201.

In 1951, gross fixed capital formation in agriculture was about $0.5 billion or 13 percent of the total new capital formation in the economy; in 1975, the corresponding figures were $2.5 billion and 8 percent.

## 1.3 THE FARM SECTOR ON A REGIONAL BASIS

Nearly all farms are less than 300 miles from the southern border of Canada but are spread unevenly across the ten provinces. Farming makes use of a great variety of soil types, and makes different contributions to the local economies depending on the type of agriculture involved and the suitability of the region for agriculture. Geographically, there are five broadly-defined agricultural regions: British Columbia, the Prairie, Central, Atlantic and Northern regions, the latter being largely undeveloped.

An indication of the importance of agriculture as a primary industry within the economy of each region can be obtained from Table 1.2 which shows the percentage of value added in 1974 by each of the five primary industries.

Table 1.2 CENSUS VALUE ADDED IN FIVE PRIMARY INDUSTRIES BY REGION, CANADA, 1974

| | Atlantic Region | Quebec & Ontario | Prairie Region | British Columbia |
|---|---|---|---|---|
| | - percent of regional total - | | | |
| Agriculture | 16.7 | 27.2 | 40.7 | 10.0 |
| Forestry | 8.3 | 8.0 | 0.6 | 30.0 |
| Fisheries & Trapping | 16.7 | 0.6 | 0.2 | 5.0 |
| Mining | 33.3 | 36.9 | 54.3 | 40.0 |
| Utilities | 25.0 | 27.3 | 4.2 | 15.0 |

Source: Statistics Canada, Cat. 13-201.

The Prairie region contains 75 percent of the total agricultural land and, under present technology, is adapted to the production of wheat, coarse grains, oilseeds and livestock. Farms in this region are characterized by large areas and extensive mechanization. Together with the extractive industries, agriculture accounted for nearly half of the $16.8 billion total value-added in the goods-producing sector of the western economy in 1973. Prairie farm cash receipts have grown at an annual rate of 5.5 percent since 1951 which is slightly above the national rate. In 1976, farm cash receipts in the Prairie region were about $ 5 million and constituted 51 percent of total farm cash receipts in Canada.

Prairie net farm incomes, in response to high world grain prices and increase in output, more than doubled between 1972 and 1975 to reach $2.4 billion and thus contributed significantly to the rise in regional personal income per capita. The large net income from grain following 1973 may have slowed the pace of diversification to livestock in the prairie economy.

Livestock and dairy production constitute the greater part of British Columbia's agriculture which also includes a well-developed fruit and vegetable industry. Farm cash receipts in British Columbia reached $437 million in 1976 and represented 4.5 percent of the Canadian total. At a yearly rate of 5.4 percent, the growth in British Columbia farm cash receipts has been slightly faster than that of the nation as a whole.

The Central region is the second largest agricultural area of Canada with most of the farms located along the St. Lawrence River, in the Ottawa Valley and in Southern and Western Ontario. Most farms in Ontario and Quebec are in the range of 28 to 160 hectares. Well over half of Quebec's commercial farms are dairy farms, the next being beef cattle, hogs and sheep, followed by mixed farming. Forage is the largest cultivated crop in Quebec and the province is a serious competitor with other areas in apple production. The economic situation in Quebec agriculture has been comparatively good in recent years; in 1975, there was an increase of three thousand jobs in this sector.

Ontario has more farms than any other province and its agriculture is very diversified. The province has by far the largest number of commercial livestock farms and is second only to Quebec in number of dairy farms. Forage crops occupy the largest area, while other significant crops include apples, grapes, tobacco, potatoes and soybeans. The most agriculturally productive as well as the most densely populated and highly industrialized area of Canada is the southern lowlands of Ontario. In spite of the fact that Ontario's agriculture makes a significant contribution to the national agricultural economy, the service industries are dominant within the province. In 1973, these accounted for 57 percent of total value added in comparison to 43 percent for all goods-producing industries and 5.5 percent for agriculture alone. Since 1951, farm cash receipts in the Central region have increased at the annual rate of 5 percent, about the same as the national rate, and today represent approximately 40 percent of total farm cash receipts in Canada.

Three and one-half percent of farm cash receipts in Canada come from the Atlantic region. The shortage of arable land in Newfoundland limits the development of agriculture, and the fishing industry remains of primary importance to the province. In Prince Edward Island, farming is the principal occupation, although the province is also heavily dependent upon fishing. The most important single crop is potatoes but dairying, other livestock and horticulture are also significant farm enterprises. In New Brunswick, more than a third of the commercial farms are classed as dairy farms, potatoes and livestock accounting for the remainder; in 1976, farm cash receipts were $108 million. In comparison, farm cash receipts in Nova Scotia were $114 million, with mainly mixed and fruit farming contributing. Since 1951, the growth in farm cash receipts in the Atlantic region has been 4.0 percent per annum which is slower than the national average.

The Northern agricultural region lies north of latitude 55° and consists mainly of the MacKenzie River Valley and parts of Yukon and British Columbia. Farming is generally on a small scale and agricultural development is limited by the short growing season. It has been estimated that the region has more than 1.1 million hectares of potentially arable land together with extensive areas suitable for grazing.

## 1.4 SIGNIFICANT TRENDS

The most important change in farming in the past two decades has been the substitution of inputs purchased from the non-farm sector which have increased the productivity of land and replaced about half of the farm labor force. The result has been a significant overall growth in Canada of agricultural labor productivity.

There has also been a small net decrease in the area of agricultural land under cultivation resulting from a reduction in the east. Offset only partly by a slight expansion in the west. The forces at work include competition from urban and industrial uses and increases in the productivity of land. The incentive to expand farm size to attain the benefits of improved machinery and equipment has been met by consolidation of existing farm land into larger family farm units.

The primary sector has been influenced by the growing importance of food processing and distribution, and particularly by the growth of large firms in these subsectors. These firms are consumer-oriented and their operations reflect research and promotional activities to meet consumer demands. As a result, farmers increasingly are called upon to tailor production to meet the particular requirements of processors' and distributors' procurement practices and to participate more in coordinating production with marketing.

There have been significant changes in Canadian farming resulting from the application of new technology in both plant and animal production. The adaptation of new crop varieties to expanded production areas, the adoption of important new species such as rapeseed, the improvement in animal gain efficiency, and the application of higher standards of plant and animal health have contributed greatly to the development of agriculture in the Canadian industry. These changes have been the direct result of agricultural research in Canada.

These favourable trends have enabled Canadians to enjoy one of the highest food standards in the world in terms of quality and also one of the lowest costs in terms of the percentage of disposable income spent on food. The maintenance of such high standards is a significant accomplishment because Canada has relatively few commodities from which to choose in developing a viable agricultural industry. The resource base and particularly the climate impose limitations on the range of agricultural products which can be produced and on the extent of suitable growing areas. Transportation too is a significant factor because the main export-producing areas are located inland and most farms are situated in a long and relatively narrow strip along the Canada-United States border.

## 2. CANADIAN AGRICULTURE IN A WORLD SETTING - HIGHLIGHTS

1975

1. At present, there are about 1,473 million hectares of arable land or 11 percent of the world's area under cultivation. It is estimated that there is as much potential arable land as there is at present under cultivation. The ratio of total agricultural land to total population is 0.6 hectare in the developed countries, and 0.3 hectare in the developing countries.

2. World population has been growing at an annual rate of 2 percent and now stands at approximately 4 billion. In the developing countries, about 65 percent of population is active in agriculture, while in the developed countries, agricultural population represents about 12 percent of the total. World food production is increasing faster than world population, but because of much faster population growth in the developing countries, the increase on a per-capita basis in these countries is only marginal.

3. In the early 1970's, per-capita food production in the developing countries was little more than one quarter of that in the developed countries. These account for about 30 percent of the world population yet produce approximately 60 percent of the world's food.

4. The average diet of the population in the developing countries is poor and below nutritional requirements, while the energy supply available to populations in the developed countries is about 20 percent above requirements.

5. Over the past two decades, the volume and value of world agricultural trade increased significantly. Nonetheless, total trade and aid in agricultural products account for only one-tenth of the food produced in the world. There is considerable difference in the quantities of individual commodities traded.

6. Over two-thirds of the world trade is between the developed countries. A large part of the food imports of the developing countries consists of cereals which are shipped as food aid. Many former cereal exporters have gradually become net importers, while the United States and Canada have emerged as the main cereal exporters.

7. The increasing instability in world agricultural markets is caused by climatic variations and by changes in the economic and trade policies of the major countries. The problem may be aggravated in the future because of the tendency towards increased self-sufficiency in many

regions of the world. Improved global information systems, medium-term contracts and multilateral commodity agreements could have a stabilizing effect on agricultural trade, prices and incomes.

8. Canada's population, arable land, food production and agricultural trade in relation to the world total are very small, but Canada's share of the world's grain and oilseed exports is quite significant. Canada's main export commodities are: wheat, wheat flour, barley, rapeseed, flaxseed, live animals and skim milk powder. The leading export markets for Canadian commodities are Japan, the European Economic Community, the United States, the Soviet Union and China.

9. Between 1965 and 1974, Canadian agricultural exports increased by 140 percent. Whereas exports to the developed countries increased by 85 percent, exports to the developing countries increased by 370 percent. In 1974, exports to the developing countries represented 37 percent of the total.

10. Canada supports agricultural development assistance programs in many countries of the world, and at present, is the largest per-capita donor of food aid in the world.

## 2. CANADIAN AGRICULTURE IN AN INTERNATIONAL SETTING

### 2.1 OVERVIEW OF WORLD AGRICULTURE

Agriculture is the world's largest primary industry in terms of its impact on humanity. It is a major source of employment and plays a vital role in the economy of all nations. The basic necessities of life - food, clothing and shelter - are products of the land, as are the raw materials for the many components of the food industry.

Strictly speaking, there is no 'world agriculture' but rather, a large number of national economies interrelated through markets, trade institutions and international arrangements. There are, however, certain features in all these economies that can be considered on a world basis; namely, land resources, population, production, consumption, trade and purchasing power.

At present, world agriculture faces the formidable task of providing adequate food supplies for a growing world population of over 4 billion people. While, in the global context, present food production is sufficient to feed the world adequately, on a regional and country basis there are serious disparities between the demand and supply of food. These have been created by the fact that not all countries produce or are able to produce enough food to satisfy their domestic requirements. Under normal circumstances, the surplus and deficit producing countries would equalize their needs through trade. However, not all are in a position to buy on a commercial basis the necessary food for their population. Hence, new developments in agricultural trade have now become institutionalized, namely trade on concessional or special terms, and trade in the form of food aid.

#### 2.1.1 Land Resources

At present, about 22 percent of the total continental area, 1,473 million hectares of the world's arable land are under cultivation. Of the arable land, 46 percent is in the developed countries and 54 percent in the developing countries.

According to the Food and Agriculture Organization (FAO) estimates, there are many millions of hectares of this land, particularly in the developing countries, that could be brought under cultivation if sufficient funds were available for their development and the demand for food increased substantially.

#### 2.1.2 Population Trends

For the last two decades, world population has been growing at an annual rate of 2 percent (Table 2.1). However, in the developed countries, this growth has been close to 1 percent per annum and in the developing countries it has been 2.3

Table 2.1 REGIONAL DISTRIBUTION OF WORLD POPULATION IN 1970 AND PROJECTIONS FOR 1985

| | 1970 | | 1985 | | Annual Rate of Increase | | |
|---|---|---|---|---|---|---|---|
| | Millions | (%) | Millions | (%) | 1970-75 | 1975-80 | 1980-85 |
| World[a] | 3,610 | 100 | 4,816 | 100 | 1.9 | 2.0 | 1.9 |
| Total OECD[b] | 735 | 20 | 845 | 18 | 1.9 | 1.0 | 1.0 |
| USA | 204.9 | 5.6 | 236 | 4.9 | 0.9 | 0.9 | 1.0 |
| Canada | 21.4 | 0.6 | 27 | 0.6 | 1.3 | 1.5 | 1.5 |
| Japan | 104.3 | 2.9 | 122 | 2.5 | 1.3 | 1.1 | 0.8 |
| Australia | 12.6 | 0.3 | 16 | 0.3 | 1.9 | 1.8 | 1.7 |
| New Zealand | 2.8 | - | 3.5 | - | 1.4 | 1.5 | 1.4 |
| European Community (9) | 251.3 | 7.0 | 174 | 5.7 | 0.6 | 0.6 | 0.7 |
| Other OECD - Europe[b] | 137.2 | 3.8 | 166 | 3.4 | 1.2 | 1.3 | 1.4 |
| USSR | 242.8 | 7 | 282 | 6 | 1.0 | 1.0 | 1.0 |
| Other East European countries | 105.1 | 3 | 118 | 2 | 0.7 | 0.8 | 0.8 |
| Asia[c] | 1,889 | 52 | 2,615 | 54 | 2.2 | 2.3 | 2.2 |
| China | 771.8 | 21.4 | 973 | 20.2 | 1.7 | 1.6 | 1.4 |
| India | 543.1 | 15.0 | 783 | 16.3 | 2.4 | 2.5 | 2.4 |
| Indonesia | 119.5 | 3.3 | 175 | 3.6 | 2.6 | 2.6 | 2.5 |
| Bangladesh | 67.7 | 1.9 | 98 | 2.0 | 1.7 | 2.8 | 2.9 |
| Pakistan | 60.4 | 1.7 | 97 | 2.0 | 3.1 | 3.2 | 3.2 |
| Latin America[d] | 283.0 | 8 | 425 | 9 | 2.7 | 2.7 | 2.7 |
| Brazil | 95.2 | 2.6 | 145 | 3.0 | 2.8 | 2.8 | 2.8 |
| Mexico | 50.3 | 1.4 | 83 | 1.7 | 3.2 | 3.3 | 3.4 |
| Argentina | 23.7 | 0.7 | 29 | 0.6 | 1.3 | 1.3 | 1.2 |
| Africa | 351.6 | 10 | 531 | 11 | 2.6 | 2,8 | 2.9 |
| of which North Africa[e] | 85.6 | 2.4 | 130 | 2.7 | 2.7 | 2.7 | 2.8 |

[a]The world totals have been adjusted to take account of differences between assumptions concerning international immigration and emigration. The figures for 1985 have been rounded off.
[b]Including Turkey and Yugoslavia.
[c]Excluding Asian members of the OECD (Turkey and Japan).
[d]Covering the tropical zone of South America, Central America, the temperate zone of South America and the Antilles.
[e]Covering Egypt, the Sudan, Morocco, Algeria, Tunisia, the Libyan Arab Republic and the Spanish Sahara.

Source: United Nations, World Population Prospects, 1970-2000, as assessed in 1973 ESA/P/WP53, New York, (not yet published).

percent. At present, 28 percent of the world population lives in the developed countries and 72 percent in the developing countries.

The ratio of total agricultural land to total population shows that, on a world scale, there is close to 0.4 hectare of land per person. In the developed countries, this ratio is 0.6 hectare, and in the developing countries, it is close to 0.3 hectare. In Canada, the ratio is 2 hectares per person.

Another important feature of world agriculture is that slightly more than half of the world population (i.e. 2 billion) is active in agriculture. On a regional basis, the differences are much more striking. In Africa, 70 percent of the population is active in agriculture, with the proportion being as high as 90 percent in some countries. In Asia, the agricultural population represents about 65 percent of the total while in India and Bangladesh the percentage is about 70. In contrast, in the developed regions of the world agricultural population represents less than 20 percent of the total, and in some countries less than 5 percent. In the centrally planned economies, there is a considerable difference in the proportion of population active in agriculture. In China, this is about 65 percent; in the USSR, 30 percent; and in East Germany, slightly more than 10 percent.

In the developed market-economy countries as a whole, the number of people dependent on agriculture is declining, while in the developing market-economy countries, the absolute number of the agricultural population is still rising steadily.

### 2.1.3 Agricultural Systems and Productivity

The agricultural systems of the various countries of the world are vastly different. In the centrally planned economies, almost all land is socialized and operated under a central state plan. In the developed and developing market economies, land is mainly operated by farm owners and their families. The contrasting functions of management are difficult to compare because of differences in farm size, organization, the degree of government involvement, and the economic environment. Also, because of great differences in natural resources, technology, organization of production and the levels of inputs, there are major differences in the productivity levels of land and labour in the various countries.

Available data show that the productivity of land, as measured by the average yield of wheat, for example, varies from about 0.4 to 4 tonnes per hectare, a tenfold difference. Canada, with about 2 tonnes per hectare of wheat, is close to the world average, but far below the level achieved by the most efficient world producers; this is largely because of climatic conditions rather than management efficiency or labour productivity.

Comparing the productivity of labour reveals even greater differences than comparing the productivity of land. Generally, in most developed market economies, the average farm worker's productivity is high, and consequently he produces enough to feed a large number of non-farm workers. In many developing countries, in contrast, the average family farm supplies less than one non-farm family in addition to providing for its own subsistence. In centrally planned economies, the productivity of labour is intermediate.

Studies on the productivity of land indicate that its level depends on the properties and qualities of various inputs, the manner in which they are combined and utilized for production, and on the effective market demand. While the productivity of land tends to be highest in densely populated countries, labour productivity is closely related to the general level of economic development. High incomes and alternative employment opportunities in the developed countries have caused workers to shift to non-agricultural sectors, and the substitution of capital for labour has resulted in a high level of productivity in relation to the small proportion of the labour force remaining in agriculture. According to FAO estimates, Canada ranks fourth among the developed countries in such a measure of labor productivity.

### 2.1.4 Food Production and Consumption

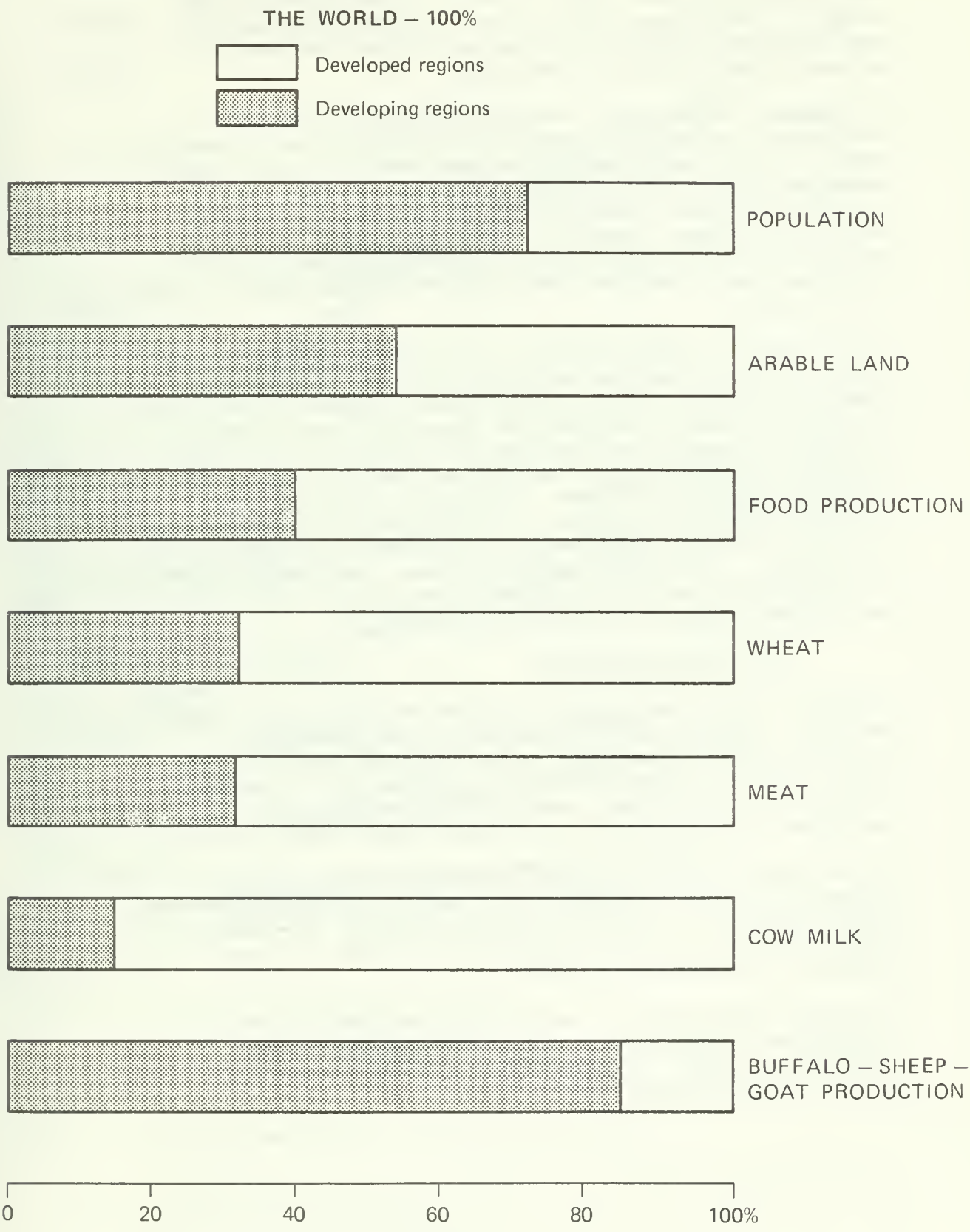
Statistical data on food production trends indicate that, during the past two decades, the world has experienced the greatest growth in its food supplies. World food production rose in that period by about 70 percent, or approximately 2.7 percent a year. At the same time, the population grew at an average rate of 2 percent, resulting in an annual increase in per-capita food production of only 0.8 percent.

On a regional basis, the situation has been quite different. The developed exporting countries produced more than they could consume or export, and the developing countries could not produce fast enough to satisfy their growing demand. Consequently, the latter countries had to import food on an increasing scale. Yet, during the past two decades a number of developing countries were expanding their agricultural output just as fast as the developed countries. The problem is that they have been facing a much faster population growth, and most of the increase in food production has been absorbed by additional populations, with only marginal increases made on a per-capita basis (Figure 2.1).

#### Grain Production

Grain supplies play an important role in the world food situation. Firstly, grain is the principal item of human diet in most of the developing countries, and secondly, it is the principal feed for animal production in the developed countries. Grain production has been increasing annually by about 3 percent over the past 15 years. An annual rise in

FIGURE 2.1 – COMPARISON OF WORLD POPULATION, ARABLE LAND AND PRODUCTION, 1973 – 75 AVERAGE



yields of about 2.5 percent has accounted for most of this increase. Total world grain production (all grains and rice) rose from 920 million tonnes in 1961 to about 1,360 million tonnes in 1976 (Figure 2.2). Wheat, rice and maize are the most important world grain crops, and account for about 75 percent of the total crop production.

At present, 70 percent of the world population live in the developing countries and produce only 40 percent of the world's food. On a per-capita basis, the developed countries (market economies plus the USSR and Eastern Europe) produce over 620 kilograms of grains, while the developing countries produce only 200 kilograms. Looking at selected regions in 1971-73, North American per-capita grain production was about 1,200 kilograms, Latin American, 240 kilograms and Far Eastern, only 200 kilograms.

Also, there is a great diversity in the quantities of grains used in different regions and countries. For example, in 1969-71, in Canada and the United States, between 800 and 900 kilograms of grains were used per person per annum. However, only 80 kilograms or one-tenth of this quantity, was consumed directly as food, and the remainder was fed to livestock or used for industrial purposes. In Europe, about 400 to 500 kilograms was used per person. Of that total, food represented over 100 kilograms, feed about 250 kilograms and industrial use the balance. In the developing countries, total use of grains was between 200 and 250 kilograms per person and most of that was consumed directly as food (Table 2.2).

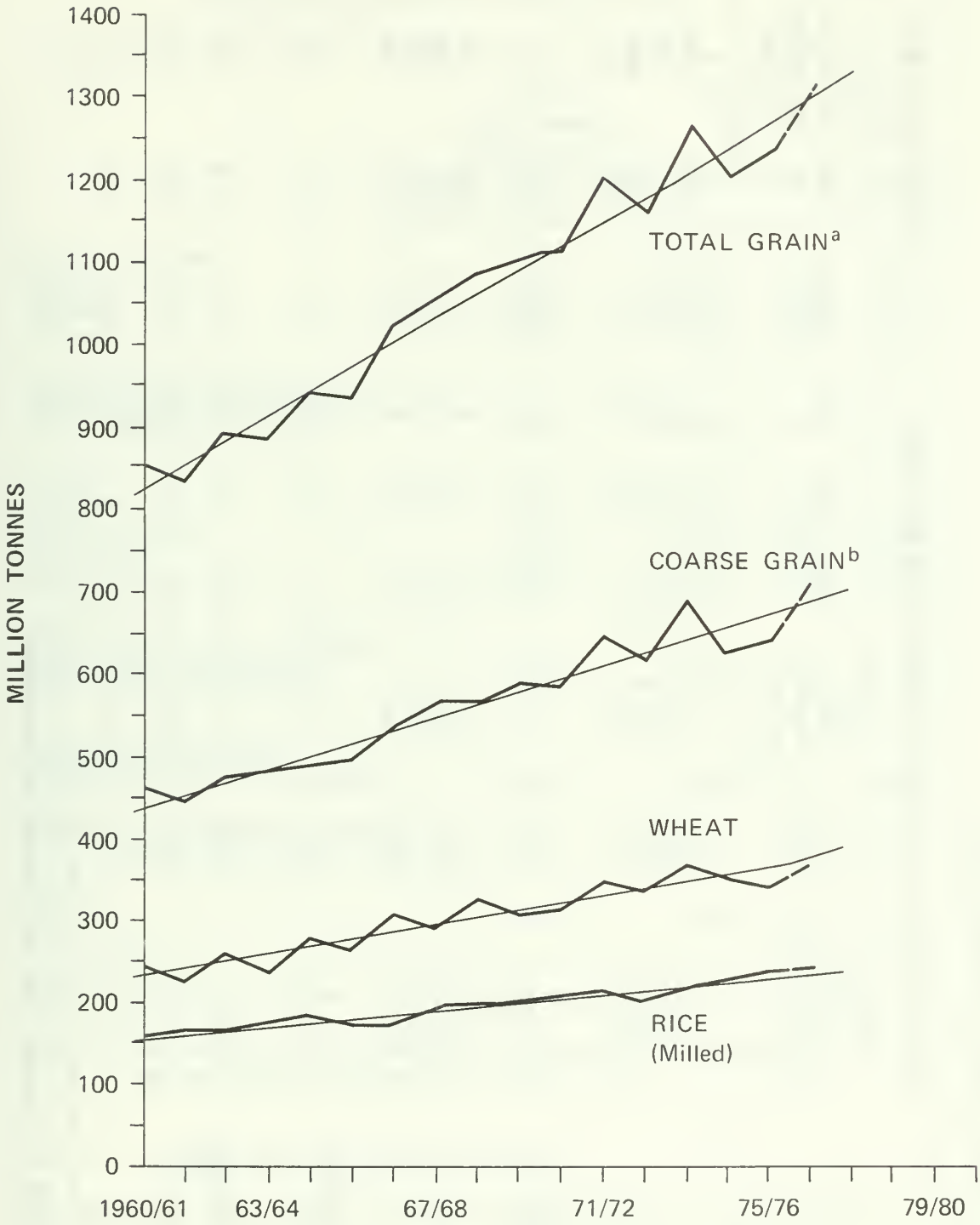
## Nutritional Standards

Comparing other major commodities such as starchy roots, sugar and meat, production and consumption in the developing countries is much lower than in the developed countries, with minor exceptions. Consequently, the average diet in developing countries is insufficient, and the calorie and protein supplies are below the normal human nutritional requirements.

FAO estimates prepared for the 1974 World Food Conference indicate that well over 450 million people are malnourished and hungry. About one-third of those live in Asia, one-fourth in Africa, one-fifth in the Near East and the rest in other regions of the developing world.

In contrast, the dietary energy supply available to the populations of developed countries averages about 3,200 calories per person per day, and is about 20 percent above nutritional requirements (Table 2.3).

FIGURE 2.2 – WORLD GRAIN PRODUCTION
Actual and Trend, 1960 to 1978




[a] Includes wheat, milled rice, major and minor coarse grains.

[b] Includes major coarse grains (corn, barley, rye, oats and sorghum) and minor coarse grains (millet, mixed and other grains).

Source: USDA Economic Research Service.

Table 2.2 WORLD LEVELS OF FOOD CONSUMPTION, 1970

| | Consumption of principal foodstuffs (kg per head) | | | | | | | Calories per day | |
|---|---|---|---|---|---|---|---|---|---|
| | Cereals for direct consumption (a) | Starchy roots | Sugar and sugar products | Meat | Eggs | Fish | Whole Milk | Total | Of which: of animal origin |
| North America | 90.3 | 55.1 | 56.0 | 109.5 | 17.8 | 10.7 | 157.3 | 3,318 | 40% |
| Western Europe | 123.6 | 88.3 | 39.5 | 68.0 | 12.7 | 17.6 | 90.8 | 3,133 | 35% |
| Oceania | 106.9 | 58.8 | 52.8 | 114.1 | 13.3 | 6.8 | 167.4 | 3,261 | 46% |
| Others | 178.5 | 32.8 | 30.0 | 25.6 | 14.5 | 51.6 | 43.2 | 2,554 | 18% |
| Total developed countries with market economies | 122.6 | 67.4 | 43.3 | 74.4 | 14.6 | 21.3 | 104.7 | 3,091 | 34% |
| Africa | 138.4 | 177.4 | 9.2 | 12.8 | 1.1 | 6.9 | 18.5 | 2,188 | 6% |
| Latin America | 126.9 | 100.8 | 43.8 | 36.8 | 4.7 | 6.9 | 59.2 | 2,528 | 18% |
| Near East | 186.7 | 23.4 | 19.1 | 14.9 | 1.5 | 2.2 | 25.3 | 2,495 | 10% |
| Asia and Far East | 193.7 | 25.5 | 28.5 | 4.5 | 0.8 | 7.8 | 16.4 | 2.082 | 6% |
| Total developing countries with market economies | 173.3 | 61.6 | 27.0 | 12.1 | 1.6 | 7.0 | 24.6 | 2,211 | 9% |
| Asian countries with centrally planned economies | 206.7 | 101.7 | 5.6 | 18.7 | 3.6 | 9.2 | 2.9 | 2,174 | 9% |
| USSR and Eastern Europe | 207.2 | 102.3 | 40.9 | 48.8 | 9.3 | 18.3 | 163.1 | 3,265 | 24% |
| WORLD | 173.8 | 77.2 | 26.9 | 29.5 | 5.4 | 11.5 | 49.2 | 2,480 | 17% |

[a]Excluding cereals used for animal feed and industrial purposes.

Source: Unpublished FAO estimates.

Table 2.3 COMPARISON OF CALORIE REQUIREMENTS AND AVAILABILITIES THROUGHOUT THE WORLD, 1961 and 1970

| | Energy requirements kg/calorie per person/day (a) | Average calorie availabilities | | |
|---|---|---|---|---|
| | | 1961 | 1969-71 | Change |
| North America | 2,642 | 3,110 | 3,320 | +210 |
| Western Europe | 2,565 | 3,020 | 3,130 | +110 |
| Oceania | 2,656 | 3,210 | 3,260 | + 50 |
| Others | 2,363 | 2,420 | 3.550 | +130 |
| Total developed countries with market economies | 2,555 | 2,950 | 3,090 | +140 |
| Africa | 2,335 | 2,120 | 2,190 | + 70 |
| Latin America | 2,383 | 2,410 | 2,530 | +120 |
| Near East | 2,456 | 2,200 | 2,500 | +300 |
| Asia and Far East | 2,223 | 2,050 | 2,080 | + 30 |
| Total developing countries with market economies | 2,284 | 2,130 | 2.210 | + 80 |
| Asia countries with centrally planned economies | 2,355 | 2,020 | 2,170 | +150 |
| U.S.S.R. and Eastern Europe | 3,570 | 2,900 | 3,260 | +270 |
| WORLD | 2,385 | 2,380 | 2,480 | +100 |

[a]Evaluation of the most recent requirements.

Source: United Nations World Food Conference, Assessment of the World Food Situation, Rome, 1976.

### 2.1.5 Income Level and Distribution

The quantity and nature of human food consumption is influenced by the level of per-capita income and by its distribution within each country. Thus, the market demand for food depends on the purchasing power of specific population segments.

Recent statistical data show that the per-capita gross national product ranged from more than $6,000 in North America (Canada and the United States) and a few Western European countries, to less than $200 in many Asian and Central African nations.

Average 1970 per-capita income in the developed regions (Japan, North America, Western Europe, Oceania and the USSR) was $2,750 or eleven times greater than the $250 average in the developing countries (Africa, Asia, Middle East, Latin America and Southern Europe). There figures indicate large income disparities between the world's 'have' and 'have not' countries.

From 1960 to 1970, the annual growth rate of the world per-capita income was more than two times greater than world population growth. However, per-capita income grew faster than population primarily in the developed countries, while the opposite occurred in many developing countries.

Food expenditures account for a large proportion of total consumer expenditures in developing countries. In the world, this recently ranged from below 20 percent in the United States and Canada to more than 60 percent in Ghana and a number of other developing countries, with most countries between 30 and 40 percent. Agricultural efficiency and the level of general economic development are two major determinants of the share of consumer income spent on food. A recent analysis of income distribution in 44 developing countries showed that a large proportion of the total income accrued to relatively few, with the wealthiest 20 percent receiving 56 percent of all income, and the poorest 20 percent realizing only 6 percent.

Many countries with serious income distribution problems have experienced malnutrition and starvation in recent years. Even in those countries, including the United States and Canada, where the average proportion of consumer income spent on food is relatively low, the poorest sectors spend close to 50 percent of their disposable income on food.

Comparing returns on farm resources (including investment in land) with those in other sectors of the economy shows that farm income is lower in nearly all developed countries; although recently, the income gap between agriculture and other sectors indicates some tendency towards narrowing. In highly industrialized countries, off-farm earnings have become an important source of supplementary revenue for farm households. It would appear that farm incomes lack stability because of the wide fluctuations in harvest and in product and input prices.

### 2.1.6 World Agricultural Trade

Total trade and aid in agricultural products account for only one-tenth of the food produced in the world. However, there is a considerable difference in the quantities of individual commodities traded. For example, in recent years, wheat trade represented close to 20 percent of the world's wheat production, and sugar, fats and oils represented about 30 percent. For the basic commodities (e.g.coffee) that account for a large amount of the export earnings of many developing countries, the proportion was much higher, ranging between 80

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and 90 percent. On the contrary, total meat exports represented only 6 percent of world meat production.

Over the past two decades, the volume and value of world agricultural trade increased significantly. However, the agricultural exports of the developed countries increased much faster than those of the developing countries. As a result, the latters' share fell from 45 percent in 1961-63 to 36 percent in 1971-75 while the share of the developed countries increased proportionately.

The developed countries' share of world grain exports has also become larger. Thus, during the 1960's, the developing and centrally planned economies have come to depend more on the developed countries for grain supplies. Among the developed countries, Europe and Japan also depend heavily upon the major grain exporting countries - Australia, Argentina, Canada and the United States.

About 80 percent of the world agricultural trade consists of competing products grown in both developed and developing countries. The developed countries already obtain about two-thirds of their imports from other developed countries, with this proportion increasing.

Food imports of the developed countries are far larger than those of the developing countries and have increased rapidly in recent years. A large part of the food imports of the developing countries consists of cereals, the staple food in most of these nations. Many former cereal exporters have gradually become net importers, while the United States and Canada have emerged as the main cereal exporters.

It should be noted that not all of the grain imports of the developing countries have been on commerical terms. Considerable amounts of the developing countries' food imports (especially cereals) have been shipped as food aid, and therefore, do not create an additional burden on their balance of payments. Food aid shipments were particularly high in the 1960's, when they ranged between 30 and 45 percent of the developing countries' total food imports. These started to go up again in 1975. Major donor countries are the United States, Canada, the European Economic Community (EEC) and Australia.

## World Market Instability

The instability of world agricultural markets is well known. During the last ten years, this instability seems to have increased for most of the agricultural products moving in world trade.

The most obvious natural factor of instability is year-to-year variation in weather, which causes considerable fluctuations in yields and thus in total output. When bad weather affects simultaneously several important grain producing areas, as

happened at the beginning of the seventies, considerable uncertainty and instability results all over the world.

In addition to natural causes, instability is also associated with changes in the world monetary system, inflation rates and the economic, agricultural and trade policies of the major countries, particularly the USSR, the United States, Japan and the EEC. Price variations for wheat, for example, were small up until 1972, largely because of Canada's and the United States' policies of holding large stocks. Also, the size of the USSR wheat crop in relation to world production can have a drastic impact on prices and stock levels, if it falls below trend and the USSR makes up part of the difference from international purchases.

The instability of markets recorded in recent years might be aggravated in the future because of the tendency towards increased self-sufficiency in several importing developed regions, and because of increases in production and export potential in the main exporting areas. Also, much of the expected rapid growth in demand for food in the developing countries is planned to be met by increased domestic food production. To achieve this, large transfers of resources are required. The United Nations Development Program (UNDP) and the Development Assistance Committee (DAC) of the Organization for Economic and Cooperation Development (OECD) estimate that total official development assistance (ODA) in 1974 rose to $3.6 billion, an increase of 44 percent over 1973. A major part of this aid was for the development of water resources, production imports (including credit) and physical infrastructure.

There are indications that total aid commitments to agriculture will continue to rise significantly in the next few years. This could lead to further instability, particularly for major exporting countries such as Canada. On the other hand, improved global information systems, medium-term contracts and multilateral commodity agreements will have a stabilizing effect on agricultural trade, prices and incomes.

## 2.2 CANADA'S POSITION IN WORLD AGRICULTURE

To assess Canada's position in world agriculture and Canada's role in feeding the world, it is necessary to first situate this country in the global context of population, arable land, agricultural production and trade.

### 2.2.1 Resource Base

Canada's present population of about 23 million represents 0.6 percent of the world population. The present rate of population growth in Canada is higher than in most developed countries, but lower than in the developing countries. Although Canada is the second largest country of the world with a total land area of 998 million hectares, its share of the

world's arable land is only about 3 percent. In addition, Canada has approximately 65 million hectares of potentially arable land that could be brought into cultivation only under a combination of most favourable conditions, and then could be used effectively only for pasture, in most cases. Thus, Canadian land resources for agricultural production are limited, and any further expansion would necessitate new technology and considerable investment.

### 2.2.2 Food Production

In recent years, Canada has grown about 3 percent of the total world grain production. Its contribution to world wheat production has oscillated between 4 and 6 percent; in the case of barley and oats, this was between 4 and 6 percent, and 8 and 12 percent respectively. In rapeseed and flaxseed, Canada's contribution amounted to 17 percent and in meat, milk and tobacco, it was about 2 percent.

Production of all fertilizers in Canada recently increased significantly to reach the level of 7 percent of world production. However, in potash, Canada occupies first place in the world, with over 20 percent of the total production.

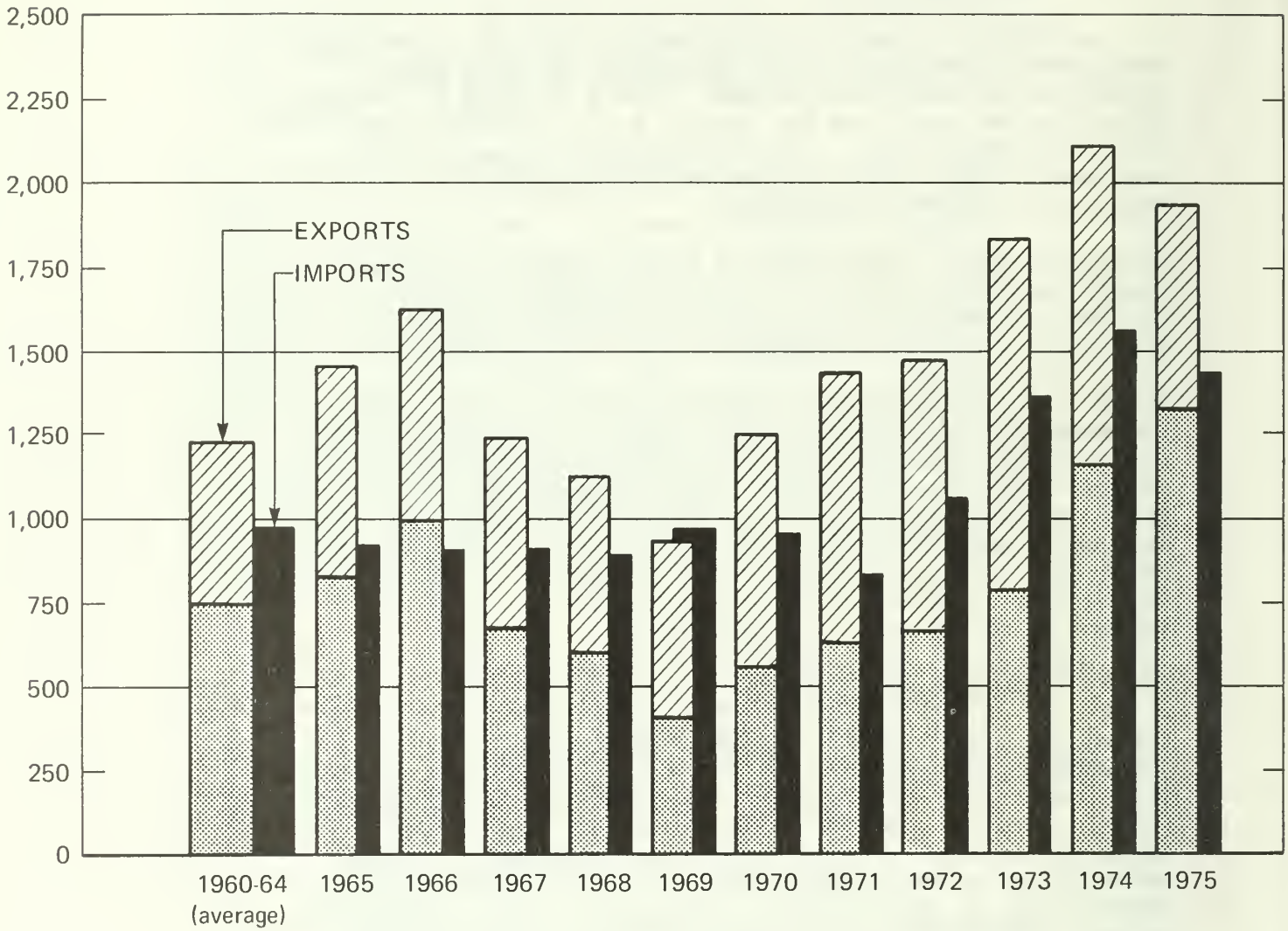
Canada has been helping to feed the world from the time that pioneers broke the sod and seeded crops. At the beginning, Canadian agricultural commodities were exported in small volumes and to few countries. Over the years, our exports have grown, and at present they reach millions of tonnes, and are shipped to almost all countries of the world. Between 30 and 35 percent of Canada's agricultural production is exported, and in the case of wheat - a basic food commodity - 70 to 75 percent of the production is exported.

### 2.2.3 International Trade

During the period 1965-74, Canada's agricultural exports increased by 140 percent from $1.6 to $3.8 billion, or close to 5 percent of the world's total (Figure 2.3). On a commodity basis, Canada's share of the world's wheat exports was close to 20 percent; for barley, rapeseed and flaxseed, this was about 20, 60 and 80 percent respectively. Canada's current wheat stocks of approximately 11.8 million tonnes (40 percent of world world wheat stocks) are the highest of all major exporters.

Whereas Canadian exports to the developed countries increased from $1.3 to $2.4 billion, or by 85 percent, exports to the developing countries including China, (both commercial sales and food aid), increased from $300 million to $1.4 billion, or by almost 370 percent. In 1965, Canada's agricultural exports to the developing countries represented 19 percent of total Canadian agricultural exports, and by 1974, had increased to 37 percent. Thus, the pattern of Canadian agricultural exports has been changing very noticeably, and even more so in the last few years.

FIGURE 2.3 **CANADA'S AGRICULTURAL TRADE, 1960 to 1975**




Source: Statistics Canada, Cat. 65–202 & 65–203.

Canada's main export commodities are: wheat and wheat flour, barley, flaxseed, rapeseed, live animals, meats and skim milk powder. Wheat is Canada's most important agricultural export, valued at about $2 billion yearly. Canada is the world's second largest wheat exporter, being surpassed only by the United States. Canada has barley as its second most important export commodity, and is the world's second largest barley exporter, with the EEC occupying first place. Canada is the world's largest rapeseed and flaxseed exporter, accounting for over 60 percent of world total exports. The leading buyers of Canadian commodities are Japan, the EEC, the United States, and Soviet Union and China.

Canada's main import commodities are: raw sugar, fruits, nuts, vegetables, plantation crops and dairy products. The leading suppliers of Canadian imports are the United States, Australia and the EEC.

Traditionally, Canadian agriculture has had a positive trade balance. This reached a high of over $1 billion in 1974 and 1975, boosted by expanded wheat exports. For the first time in Canada's history, the agricultural trade balance was negative (-$35 million) in 1969. This was due to a combination of lower grain exports and rising levels of agricultural imports, but since 1970 and to this date, the balance has again been positive.

## Canada's Competitive Position

Canada maintains a relatively stable absolute advantage in the production of wheat, barley, flaxseed and rapeseed over other major exporting countries. For the production of all feed grains, the United States enjoys a substantial cost advantage, due mainly to corn.

The situation for livestock and meat is very difficult to analyse because of short-run cycles and substantial changes in input costs in recent years. However, on the basis of averages, Canada appears to have a cost advantage in feeder cattle. Both Canada and the United States are at a comparative disadvantage in manufacturing beef production in relation to Australia and New Zealand. The United States presently appears to have a general competitive advantage over Canada in hog production, which follows in part from its more favorable climate, generally greater application of new technology and lower production costs.

In fruits and vegetables, the general advantage of the United States over Canada stems again from climate with numerous crops (e.g. citrus) unable to grow in Canada, an early and late season advantage and other regional location and production efficiencies. Canada has an overall advantage in cool-climate crops such as turnips, potatoes, blueberries and raspberries.

In the production of carrots, potatoes, apples and strawberries, Canada has certain regional and seasonal advantages.

### 2.2.4 Food Aid

Canada's food aid program started with the shipment of wheat to India under the Colombo Plan. Canadian International Food Aid comprises three sub-programs: bilateral, multilateral and emergency food aid. The major part is provided through bilateral food aid programs under which mainly wheat and wheat flour are supplied.

Canadian food aid is also provided on a multilateral basis through the World Food Program (WFP) and the United Nations Relief and Works Agency. This is composed of a variety of commodities besides wheat, and forms a balanced nutritional package destined for poor and malnourished populations in various parts of the world. In recent years, Canada has shipped food to about 50 countries for both emergency and development projects.

During the last decade, Canada's food aid program totalled more than $1.2 billion, and is still increasing significantly. Currently, Canada is the largest per-capita donor of food aid in the world.

In addition, Canada is supporting agricultural development assistance programs in many countries of the world, as well as the programs at several of the international agricultural research centers. Canadian activities include the provision of fertilizers, research in dryland farming, water resource evaluation, the development of wheat farming and of storage facilities. In total, over 200 projects are being undertaken in the field of agriculture.

## 3. THE AGRICULTURE AND FOOD RESOURCE BASE - HIGHLIGHTS

1975

1. Canada has 129 million hectares of land with some capability for agriculture, but only 49 million hectares of good land (CLI Classes 1 to 3).

2. Forty-four million hectares of Canadian land is considered improved farmland and, of this, 70 percent is located in the Prairie Provinces. Recent trends show a gradual expansion of land in farming in the western provinces and a gradual reduction in the east.

3. A wide range of climates exists over the agricultural regions of Canada but, because of the distribution and limited availability of moisture and heat, all Canadian climates are generally unfavourable for agricultural production in comparison with those of the world's major food producing areas.

4. Frost-free periods vary from 100-120 days in the prairies, to 160 days along the shores of Lake Ontario and Lake Erie, to a maximum of 220 days in the coastal areas of Southern British Columbia.

5. Growing season precipitation exceeds 500 mm in the Maritime Provinces, is slightly less in the warmer and humid areas of southern Ontario, but averages between 200 and 350 mm in the prairies and as low as 100 mm in the hot arid inter-mountain valleys of the interior southern British Columbia.

6. Supplemental irrigation is used on only about 10 percent of all improved agricultural land. An eventual potential of four to five times this amount appears feasible.

7. Total capital investment in Canadian agriculture increased from $9.2 billion in 1951 to $42.5 billion in 1971. Average capital per farm increased from $15,200 to $65,430 over the same period. The largest capital category is land and buildings which accounted for 70.8 percent of the total in 1971. In the same year, machinery and equipment accounted for 16.3 percent of total investment while livestock and poultry accounted for the remaining 12.8 percent.

8. Farm operators represent slightly more than 50 percent of total farm labour while the remainder is equally divided between hired and unpaid family labour. Between 1951 and 1971, the number of farm operators declined from 598,000 to 360,000 while labour productivity increased almost three-fold.

1975 (concluded)

9. The trend to fewer farmers is continuing as older farmers retire and relatively few are replaced. Only 13 percent of all farm operators are less than 35 years of age. However, a large proportion of today's farmers are trained to at least the high school level (17.1 percent in 1971 compared with 1.9 percent in 1951) and labour productivity in agriculture continues to increase faster than in other parts of the economy.

10. A large part of the hired labour requirements of the agricultural sector are seasonal in nature and farmers have encountered increasing difficulty in attracting qualified workers for short periods of what is often very demanding work.

# 3. RESOURCE BASE OF THE AGRICULTURE AND FOOD INDUSTRY

## 3.1 INTRODUCTION

The effectiveness and capacity of the primary agricultural sector of a nation at any point in time is determined, in large part, by its resource base. In Canada, natural resources for the production of crops and livestock are severely constrained. Because of soil and climatic limitations, much of Canada's land area is essentially unsuitable for the production of agricultural crops. Indeed, all Canadian climates are generally unfavourable to agricultural production relative to those of the world's major food producing areas. Thus, in those areas of Canada where farming is practised, the type of crops and livestock which can be raised are quite limited relative to what is possible in other parts of the world. Furthermore, the methods for raising crops and livestock must be geared directly to coping with the severity and variability of Canadian climate and soil conditions.

In the process of coping with these conditions, Canada has accumulated two other classes of resources which, because of their magnitude and character, have enabled this country to become self-sufficient in many farm products, as well as a major exporter of commodities such as wheat and feed grains. In both agricultural capital and human resources, Canada is relatively well-endowed. Capital, in the form of buildings, land improvements, livestock and machinery, embodies a high level of technology which enables Canadian farmers to achieve relatively good crop yields and especially high labour productivity despite constraining climate and soil conditions. Human resources used in farming in Canada are small in number but highly skilled in comparison with those employed in most parts of the world. The high level of technical skills and managerial competence found among Canada's commercial farmers plays a major role in effective utilization of available capital to maintain production under relatively severe and limiting natural conditions.

## 3.2 NATURAL RESOURCES

Natural resources for agriculture are typically referred to under the composite term 'land' which usually encompasses soil, climate, and water supply characteristics. Canada has 129 million hectares of land with some capability for the production of conventional agricultural crops. Because of soil and climatic limitations, the remaining 86 percent of Canada's total land area is unsuitable for even extensive farming or grazing during short periods of the year, although a significant part of such land can be (and is) used for forestry. Of the land with some agricultural capability, only 49 million hectares, or 5.3 percent of the country's total land area, can be defined as good land (Canada Land Inventory (CLI) classes 1, 2 & 3). At present, only 69 million hectares of Canadian land are used for farming purposes

as defined in the 1971 census (Table 3.1). Of this, 79 percent was located in the Prairie Provinces and 16 percent was located in Central Canada (Ontario and Quebec). A substantial share of farmland (36 percent, 1971 Census) was unimproved (i.e., being used as woodlot, rough pasture or idle land). The land classed as farmland by the CLI has some agricultural potential, and provides approximately 60 million hectares not now in farms for some agricultural purpose. However, for the most part, such land is not nearly as good as the land currently being farmed.

Of the land currently being farmed, only 15 percent does not have major climatic limitations relative to the most favourable climate in Canada. About two-thirds of the farmland in this category is found in southwestern Ontario, with the remainder located largely in Quebec and Manitoba. British Columbia also has a small area of good land with very favourable climatic conditions.

### 3.2.1 Potential Land for Crop Production

A review of the Canada Land Inventory classification of Canadian soils provides some idea of Canada's potential farm land base (Table 3.2). Of the 129 million hectares of land with some capability for agricultural production, 66 million are suitable only for forage production (primarily pasture or hay), and approximately 40 percent of this is not amenable to improvement.

Information on British Columbia is incomplete, but only a small area (less than 1 percent) of British Columbia soils suitable for agriculture are entirely free of limitations. Excessive soil moisture is a problem on roughly a quarter of the soils in the central area.

The impact of soil limiting factors varies considerably across the Prairie Provinces. For example, excessive wetness and unfavourable topography affect 50 percent of the second class soils in Manitoba, while insufficient rainfall and heat are the significant limitations on the same class in Saskatchewan and Alberta. Inadequate moisture holding capacity is a major limiting factor for class 2 soils in Saskatchewan, but not in Alberta and Manitoba.

Limitations affecting third class soils in Manitoba are due to the contrasting factors of either an excess or deficiency of soil moisture, which account for 1 and 0.8 million hectares respectively. In Alberta, predominant class 3 limitations are adverse topography (slopes of 6 to 9 percent) and poor soil structure, affecting 2.3 and 1.8 million hectares respectively, while in Saskatchewan insufficient moisture-holding capacity reduces productivity on fully three-quarters of the 10 million hectares of third class soils.

Table 3.1 BREAKDOWN OF FARMLAND, LAND WITH SOME CAPABILITY FOR AGRICULTURE, AND TOTAL LAND AREA, CANADA AND MAJOR REGIONS, 1971

| | Atlantic Provinces | | Ontario & Quebec | | Prairie Provinces | | British Columbia | | Canada | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No[a] | % | No | % | No | % | No | % | No | % |
| Improved farmland | 561 | 1.1 | 7,010 | 3.1 | 35,502 | 20.2 | 711 | .8 | 43,784 | 4.8 |
| Unimproved farmland | 858 | 1.7 | 3,826 | 1.7 | 18,576 | 10.6 | 1,647 | 1.8 | 24,907 | 2.7 |
| Total farmland | 1,419 | 2.8 | 10,836 | 4.8 | 54,078 | 30.8 | 2,358 | 2.6 | 68,691 | 7.5 |
| Other land with some agricultural capability | 9,552 | 19 | 9,902 | 4.4 | 28,021 | 16 | 12,738 | 14.3 | 60,213 | 6.5 |
| Total land with some agricultural capability | 10,971 | 21.9 | 20,738 | 9.1 | 82,099 | 46.8 | 15,096 | 16.9 | 128,904 | 14.0 |
| Non-agricultural land | 39,221 | 78.1 | 206,883 | 90.9 | 93,581 | 53.3 | 74,249 | 83.1 | 793,587[b] | 86.0 |
| Total land area | 50,192 | 100.0 | 227,621 | 100.0 | 175,680 | 100.0 | 89,345 | 100.0 | 922,491[b] | 100.0 |

[a] Thousand hectares.

[b] Includes Yukon and Northwest Territories.

Sources: (1) Statistics Canada, Cat. 96-701.
(2) Canada Land Inventory Soil Capability Analysis.

Table 3.2 POTENTIAL AGRICULTURAL LAND AREA BY SOIL CAPABILITY, CLASS AND PROVINCE, CANADA, 1971

| Soil Capability Class | B.C | Alta. | Sask. | Man. | Ont. | Que. | Atlantic Provinces | Canada |
|---|---|---|---|---|---|---|---|---|
| 1 | 70 | 813 | 1,072 | 184 | 2,249 | 14 | | 4,402 |
| 2 | 398 | 4,041 | 6,446 | 2,556 | 2,360 | 976 | 611 | 17,388 |
| 3 | 1,000 | 6,477 | 10,082 | 2,190 | 3,279 | 1,381 | 2,561 | 26,940 |
| 4 | 2,132 | 9,940 | 4,252 | 2,573 | 2.902 | 2,830 | 2,544 | 27,173 |
| 5 | 6,138a | 11,433 | 7,799 | 2,250 | 1,910 | 1,636 | 2,352 | 33,518 |
| 6 | 5,358a | 3,794 | 4,065 | 2,162 | 1,192 | 9 | 2,903 | 19,483 |
| TOTAL | 15,096 | 36,486 | 33,716 | 11,915 | 13,892 | 6,846 | 10,971 | 128,904 |

[a] Because studies on classes 5 and 6 in the provinces are incomplete, the figures shown in these classes are thought to be one-half the actual.

Sources: (1) Canada Land Inventory Soil Capability.
(2) British Columbia Environmental Land Use Commission, Victoria, B.C.

In down-rating soils to the marginal fourth class, low fertility is characteristic of nearly half of the 2.5 million hectares in Manitoba, while insufficient moisture-holding capacity accounts for over half of the 4.2 million hectares in Saskatchewan. Of the 9.9 million hectares of fourth class be relied upon to ripen grain. Adverse topography (slopes of soils in Alberta, 2.6 million are in a climate that cannot 10 to 15 percent) and low moisture-holding capacity account for 1.8 million hectares each, while poor soil structure affects nearly 5.0 million hectares partly in the poorest climatic zone.

In Eastern Canada, the suite of physical limitations for agriculture is quite different. Over one quarter of the soils in classes 1 to 4 in Ontario are limited by excess moisture, 18 percent by extremely low fertility, 15 percent by moisture deficiency and 12 percent by poor soil structure. Low fertility is the chief limitation in Quebec and in its extreme form affects 40 percent of the agricultural land

base. Excess moisture is a dominant limitation on almost one quarter of the soils in classes 1 to 4. A unique Quebec problem is land with an intricate pattern of wet and droughty soils, mostly in CLI class 4.

The Atlantic Provinces have no top quality land because soil infertility and a rather adverse climate for most crops prevails throughout the region. Furthermore, dense subsoil conditions limit one third of the possible arable area. One half of it is held back by excess stoniness, steep topography and wetness.

Productive Potential of Canadian Soils

The physical productivity relationships between the soils in Classes 2, 3 and 4 are roughly in the ratios of 0.8, 0.65 and 0.5, respectively to Class 1. These productivity indices provide a means of adjusting areas of soils in these classes to a common expression, 'Class 1 equivalent area'. The distribution of the soil resource in Class 1 equivalents (millions of hectares) is as follows:

| | | | |
|---|---|---|---|
| Saskatchewan | 15.4 | Quebec | 3.1 |
| Alberta | 13.7 | British Columbia | 2.7 (est) |
| Manitoba | 5.3 | Atlantic Provinces | 3.4 |
| Ontario | 7.8 | Canada | 51.4 (est) |

The area of the agricultural land resource, weighted in this way and with further adjustments to allow for summerfallowing, pasture requirements and land fragmentation, has been used to convey a rough idea of the untapped maximum potential in each region. It has been shown that if most Class 1 to 3 soils were managed to the level of performance found on our above-average farms, production would be boosted 43 percent above present levels for the Prairie Provinces, 88 percent in Ontario and Quebec and 150 percent in the Atlantic Provinces. Inclusion of Class 4 land raises these percentages.

While useful for an overview, these productivity indexes are rather crude. They tend to over-rate the value of soils in the lower classes, especially class 4 by failing to take into account differences in input costs per unit of output among classes. Fertilizer and tillage costs are frequently higher on lower class soils even though yields are lower.

The above estimates are based on the assumption that the mix of farming types remain the same as at present. Agricultural production ceilings expressed in this way are theoretical physical limits; socio-economic constraints ensure that only a fraction of such potential is actually attained.

While there is considerable potential for increased production through more intensive use of existing farm land, reserves of farmland also present an untapped resource for agricultural production. However, a simple comparison of the

129 million hectares that have some capability for agriculture (Classes 1 to 6) and of the 44 million hectares of improved farmland (Table 3.1), gives a totally false impression of these reserves. Most of the land not now improved is in classes 4, 5 and 6. As such, it has never been improved or, in some cases, is now reverting to its natural state because of its limited capability for farming. As most of this land can only be used for hay or pasture, and potential yields are low, there is usually no economic advantage in improving it at the present time.

An analysis of untapped land resources has actually identified five main land reserves in Canada: the Peace River area, Manitoba's Interlake region, the northern forest reserve of Saskatchewan, the northern Clay Belt of Ontario, and the Maritime Provinces. The total area is 14.1 million hectares. A large proportion of this land is too cool or has too short a frost-free season for many crops. Acid infertile soils are common. Input costs tend to be excessive for uncertain yields. This leaves only 4.6 million hectares of mainly Class 3 land with significant potential.

### 3.2.2 Climate

A wide range of climates exists over the agricultural regions of Canada. The distribution of moisture and heat as reflected in the frequency of occurrence of frost, flood, drought, extreme summer heat and winter cold, are the most important weather elements on a national scale, but other phenomena such as hail, storms and lack of sunshine also adversely affect crop development, yields and eventually the success of farming on a local or regional scale.

Growing season precipitation averages range from about 100 mm in the hot arid intermountain valleys of interior Southern British Columbia to 400-500 mm in the warm and much more humid areas of southern Ontario and exceeds 500 mm in the cooler Maritime Provinces. In addition to the constraints imposed by moisture deficit and surplus, temperature extremes, and particularly the untimely occurrence of frost during the growing season, affect Canadian agriculture in many ways. The frost-free period extends from 100-120 days on the prairies - or even as low as 80 days in exposed locations - to 160 days along the shores of Lake Ontario and Lake Erie, with a maximum of 220 days in the coastal areas of southern British Columbia.

Besides these variations of climate in space, the variability of weather over time has often had more effect on yields than all other crop-conditioning factors together. Adverse or unusual weather will cause losses to different crops in different areas at different times of the year mainly through its influence on (1) crop growth, development and yields, (2) field operations, and (3) pest development. Thus, any estimation of land worth depends on sound and

practical analysis of its climate and weather and their interpretation in relation of agricultural production. For example, climate limitations on Canada's land base result in Canadian farmland being only about half as productive on a per unit basis as United States farmland.

Recently, a preliminary Agroclimatic Resource Index (ACRI) was developed to rate the climate of Canada's agricultural land on a scale of 1 to 3, where 3 represented the climate of Essex and Kent Counties in southwestern Ontario, and 1 was typical of some of the northern fringes of agriculture or some of the driest prairie locations. The index itself takes into account frost-free season, heat accumulation and moisture deficiencies. Table 3.3 illustrates how poor are the climatic resources of the major part of our farmland. The data are expressed as percentages of the 1971 total for the ten provinces together.

Less than 15 percent of the farmland is in areas with ACRI values of 2 to 3, while 38 percent has values of only 1 to 1.5. A large part of Canada's farmland has agroclimatic resources less than half as good as those of Essex and Kent County. This is particularly evident in Saskatchewan, which has over a third of our farmland. Only 20 million hectares of farmland in the prairies can be considered free of major climatic limitations, a half of it being in Manitoba. The remainder is subject in varying degrees to insufficient heat or precipitation.

Table 3.4 shows the distribution of all Canadian land area with some climatic potential for agriculture. It totals approximately 187 million hectares and obviously includes substantial areas where soils are not suitable for farming. The general distribution is similar to that described in Table 3.3 for land actually being farmed.

While the yields of most crops have been gradually increasing over time because of improved cultural practises, introduction of high yielding and disease resistant varieties, and increased use of fertilizers, these increases are often overshadowed by year-to-year variations attributable to

Table 3.3 PERCENT OF TOTAL CENSUS FARMLAND BY PROVINCE AND AGROCLIMATIC RESOURCE INDEX (ACRI)[a], CANADA, 1971

| ACRI Class | ACRI Value | PERCENT OF 1971 Total Census Farmland (68.7 million ha) Atlantic | Que. | Ont. | Man. | Sask. | Alta. | B.C. | Total |
|---|---|---|---|---|---|---|---|---|---|
| A | 3.0 | 0 | 0 | 0.5 | 0 | 0 | 0 | 0 | 0.5 |
| B | 2.5-2.9 | 0 | 0.2 | 4.0 | 0 | 0 | 0 | 0 | 4.2 |
| C | 2.0-2.4 | 0 | 3.8 | 4.1 | 1.8 | 0 | 0 | 0.2 | 9.8 |
| D | 1.5-1.9 | 2.0 | 2.2 | 0.8 | 9.4 | 14.6 | 17.3 | 1.1 | 47.4 |
| E | 1.0-1.4 | 0 | 0.2 | 0 | 0 | 23.8 | 11.9 | 2.1 | 38.1 |

[a]The five climatic zones (A to E) in order of declining quality are based on Williams' Agroclimatic Resource Index, ACRI. This index was obtained basically by dividing the average frost-free season length by 60 to get a value which ranged from 3 in Essex and Kent Counties in Ontario to 1 in places like Fort Smith, N.W.T. or Anticosti Island, Quebec. The index was then adjusted downward in the drier parts of Western Canada to reflect lack of moisture, resulting in an index low as 1 in a small part of southwest Saskatchewan, for example. In coastal areas growing degree days, rather than the frost-free seasons, were used for deriving ACRI. A to E correspond to numerical values of ACRI. In general, B-type climates are more than twice as productive for agriculture as E-type climates.

Source: Williams, G.D.V., Population, Technology and Resources, Report 25, Science Council of Canada, 1976.

Table 3.4 AREA OF LAND[a] WITH SOME CLIMATIC POTENTIAL FOR AGRICULTURE BY PROVINCE AND CLIMATIC ZONE, CANADA, 1971

| ACRI | Alta. | Sask. | Man. | Ont. | Que. | Atlantic Provinces | Canada |
|---|---|---|---|---|---|---|---|
| | | | - 000 hectares - | | | | |
| A | - | - | - | 1,250 | - | - | 1,250 |
| B | - | - | - | 4,327 | 541 | - | 4,868 |
| C | 52 | - | 1,965 | 7,418 | 5,851 | - | 15,286 |
| D | 10,918 | 11,493 | 15,242 | 10,097 | 14,483 | 10,671 | 72,904 |
| E | 18,663 | 24,930 | 1,076 | 5,994 | 8,167 | 13,345 | 72,175 |
| F | 16,778 | 492 | - | - | 919 | - | 18,189 |
| TOTAL | 46,411 | 36,915 | 18,283 | 29,086 | 29,961 | 24,016 | 184,672 |

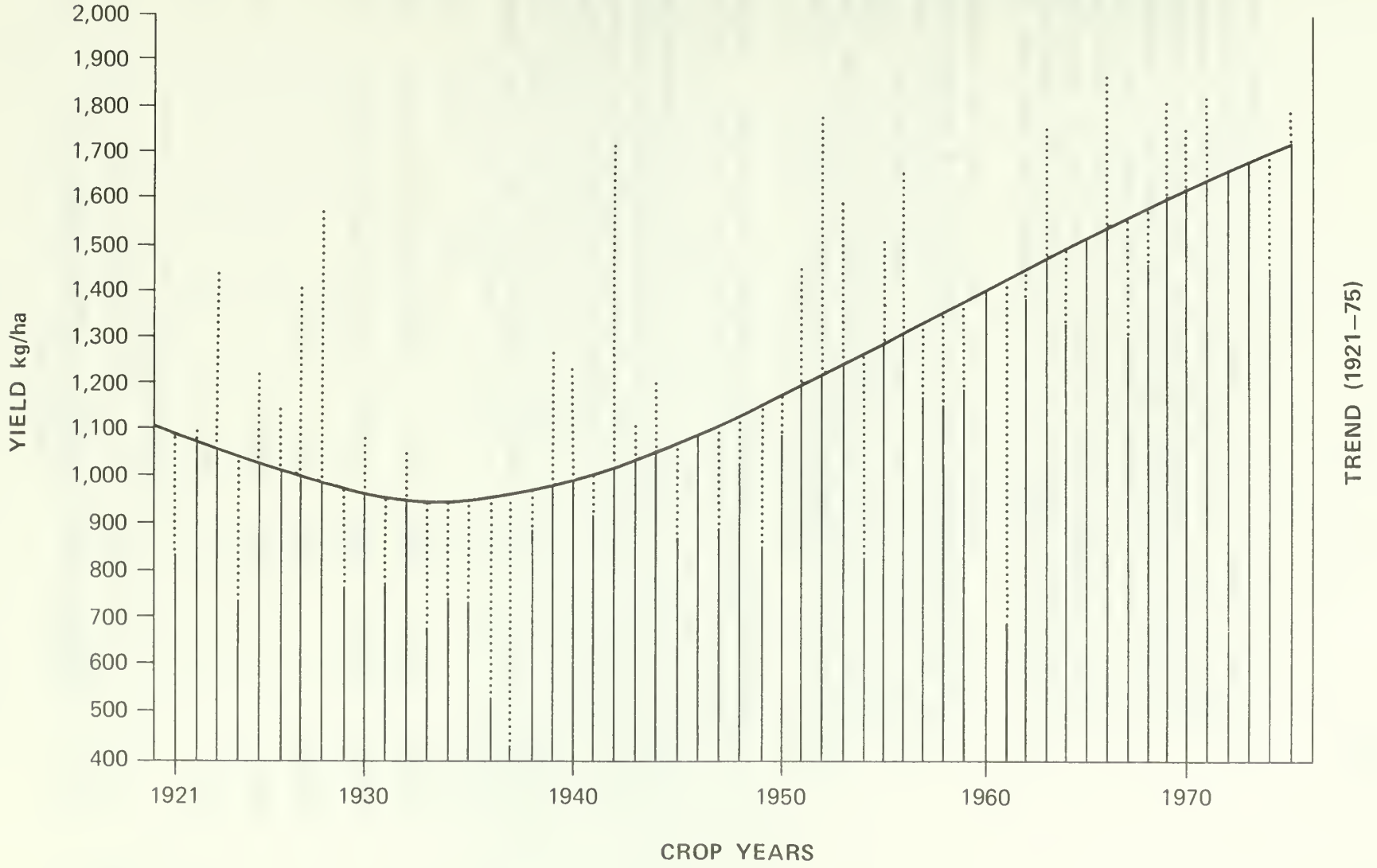
[a]Total land within the ARDA boundary (representing approximately 30 percent of Canada's total land area; land which is outside of the ARDA boundary has no capability for Agricultural production).

Source: Agricultural and Rural Development Administration.

changes in weather conditions. The effect of this on the annual production of many crops is often substantial. For example, in the case of wheat yields in the Prairie Provinces, yield variations around the trend line (Figure 3.1), indicate that actual average yields of 50 percent below or above the expected yield do occur and that deviations of up to 20 percent are more the rule than the exception.

By combining the information on Soil Capability Classes from the Canada Land Inventory with the climatic classification developed by Williams, a detailed cross classification of soils and climate has been developed to produce an agricultural land classification system. Table 3.5 shows the amounts of Canadian land with some agricultural potential falling in the various soil-climate classes. This provides dramatic evidence of the severe limitations which soil and climate combined place on Canada's natural resource base for crop production.

FIGURE 3.1 **PRAIRIE PROVINCES WHEAT YIELDS, 1921 to 1975**[a]




[a] Dotted portion of bars are deviations from trend due to weather.

The total of 114 million hectares is somewhat less than the total area of soils with some agricultural capability (129 million hectares) because some such soils are actually located in areas where climatic conditions are too severe for normal crop production.

Table 3.5 LAND WITH SOME CAPABILITY FOR AGRICULTURE CLASSIFIED BY SOIL CAPABILITY CLASS AND CLIMATIC ZONE, CANADA, 1971

| Soil Capability Class | Climatic Zone (ACRI) A | B | C | D | E | F | Total |
|---|---|---|---|---|---|---|---|
| | - 000 hectares - | | | | | | |
| 1 | 610 | 851 | 852 | 1,696 | 325 | 0 | 4,334 |
| 2 | 329 | 1,513 | 1,304 | 9,046 | 4,739 | 59 | 16,990 |
| 3 | 221 | 817 | 1,632 | 10,452 | 12,509 | 300 | 25,931 |
| 4 | 14 | 336 | 2,537 | 9,431 | 9,863 | 2,873 | 25,054 |
| 5 | 4 | 199 | 1,247 | 7,510 | 13,028 | 5,392 | 27,380 |
| 6 | 33 | 265 | 790 | 3,882 | 7,719 | 1,436 | 14,125 |
| Total | 1,211 | 3,981 | 8,362 | 42,017 | 48,183 | 10,060 | 113,814 |

Sources: (1) Canada Land Inventory Soil Capability
(2) Williams, G.D.V., Population, Technology and Resources, Report 25, Science Council of Canada, 1976.

### 3.2.3 Water

The irrigation of crops and the maintenance of livestock constitute the major demands for water supplies in agriculture. In areas where irrigation is practised, this demand is by far the greater of the two.

There are few areas in Canada where irrigation is essential for the production of crops or animal grazing. Supplemental irrigation is practiced to some extent in all provinces, but only about 1 percent of the 44.0 million hectares of improved agricultural land is being directly benefited from irrigation works now in operation. While existing irrigation water supplies will eventually limit the expansion of irrigation in areas where significant moisture shortages

occur frequently, the current annual rate of expansion in existing irrigation districts in Alberta, for example, is estimated to be about 16,000 hectares. This increase has resulted from the use of mechanical irrigation systems on land with topography not suitable for conventional irrigation systems. Present estimates based on expansion within, on the extension of irrigation district boundaries and on the expansion of irrigation water supplies suggest the following irrigation potential: 536,000 hectares in 1980; 590,000 hectares in 1985; 675,000 hectares in 1990; 800,000 hectares in 1995; and an eventual potential of 2.2 million hectares of irrigable land.

The limited area of irrigated land suggests that nearly all of it would be used to produce high value crops such as vegetables, canning crops and tree fruits. However, 35 percent of the irrigated land produces hay, 21 percent is in grain crops, 11 percent in improved pasture, and the remainder is used for assorted horticultural, oilseed and other specialty crops suited in each region. The high proportion of hay and grain crops using irrigation reflects the association of irrigated land to animal production. Large areas of irrigated land in Western Canada provide winter forage for animals which use extensive native grass ranges during the summer. In areas of intensive animal enterprises, the value of irrigated forage crops is comparable to alternatives that might otherwise be considered.

The supply of water for livestock is generally abundant in Eastern Canada, although wells and ponds are normally required to enable this to be accessed. In the Prairie Provinces, some areas have significant difficulties in maintaining good quality water supplies for livestock (and human consumption) on a year round basis. There is heavy reliance on sloughs and dugouts, while trucking of water is not uncommon in drought periods. As a result, farmers in some regions are reluctant to embark on livestock enterprises, thus providing an additional incentive to maintain a farming industry heavily oriented to cash crops.

### 3.2.4 Utilization of Land for Farming

About 15 million hectares of Canada's improved farmland is used for pasture and summerfallow. The latter use is a necessary one because of the limited moisture conditions in the Prairie Provinces. Another million hectares is devoted to farmsteads, lanes and miscellaneous uses. The remaining 28 million hectares is devoted to crop production.

Almost one quarter of Canada's crop land is in forage crops, chiefly hay. Wheat is grown on over one third of crop land and other grains occupy somewhat less than one third. All crops account for less than 40 percent of total farmland, a fact which partly reflects the soil and climatic limitations found even on land already used for farming purposes (Table 3.6).

British Columbia is heavily dependent upon forage crops but also has some significant areas devoted to grain production, especially in the Peace River region. The Prairie Provinces are heavily oriented to grains and oilseeds but also have substantial areas of forages largely for beef cattle. Quebec and Ontario are largely forage producers for the support of both dairy and beef cattle. Cropland in the Atlantic Provinces is largely devoted to hay and potatoes. While fruits, vegetables and tobacco are usually high value crops,

Table 3.6 AREA OF LAND UNDER CROPS BY PROVINCE, CANADA, 1971-1973 Average

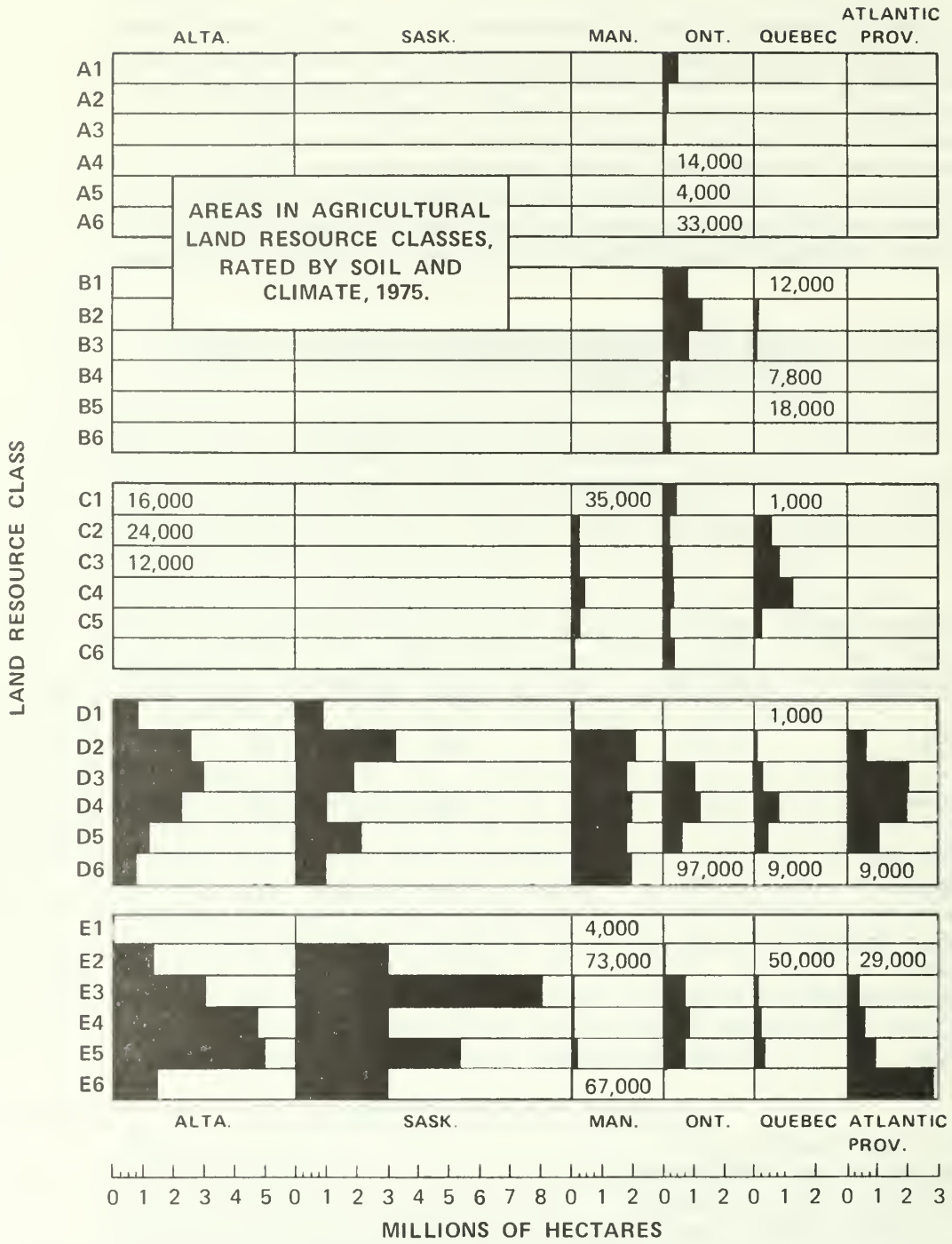
| Crops | Canada | Atlantic Provinces[a] | Que.: Ont. | Prairie Prov. | B.C. |
|---|---|---|---|---|---|
| | | | - 000 hectares - | | |
| Forage Crops[b] | 6,212 | 196 | 2,661 | 3,098 | 257 |
| Oilseeds | 2,548 | | 153 | 2,387 | 8 |
| Wheat | 9,479 | 7 | 168 | 9,253 | 51 |
| Barley | 5,191 | 17 | 168 | 4,936 | 70 |
| Oats for Grain | 2,651 | 46 | 512 | 2,063 | 30 |
| Other Grains[c] | 899 | 3 | 572 | 324 | 1 |
| Other Crops[d] | 439 | 60 | 264 | 86 | 30 |
| TOTAL | 27,420 | 329 | 4,498 | 22,147 | 447 |

[a]Includes Newfoundland.
[b]Includes corn for fodder.
[c]Includes corn for grain.
[d]Includes fruits, vegetables and tobacco.

Sources: (1) Statistics Canada, Cat. 21-003.
(2) Census of Agriculture, 1971.

they are not substantial users of Canada's land area. They are confined to the best soils and climates and only limited expansion onto other land areas is likely (Figure 3.2).

# FIGURE 3.2




The five climatic zones (A to E) in order of declining quality are based on William's agroclimatic resource index ACRI, which takes into account frost-free season, heat accummulation and moisture deficiencies. The soil capability classes rate soils as follows:

1. No limitations for general field crops.
2. Moderate limitations that restrict range of crops or require moderate conservation practices.
3. Moderetely severe limitations.
4. Severe limitations; suitable for only a few crops, or else the yield for a range of crops is low, or high risk of crop failure.
5. Perennial forage at best, but improvements feasible.
6. Perennial forage, improvements not feasible.

Data is not yet availeble for British Columbia; estimates for B.C. are 600,000 ha. in classes 1 and 2, 1.4 million ha. in class 3, and 2.6 million in class 4, in various climatic zones.

**Typifying areas**

- CLIMATE A Essex, Kent counties, Ontario only.
- CLIMATE B S.W. Ontario, shores of Lake Ontario and Georgian Bay. West part of Montreal Plain.
- CLIMATE C Immediate environs of Edmonton, Brandon, Morden. Manitoba Plain N. of Winnipeg and Portage. Central Ontario, Ottawa Valley, Manitoulin, Central St. Lawrence Lowlands of Quebec.
- CLIMATE D In Alta: part of Peace R., W. of Edmonton to Lloydminster, Camrose, Stettler, Drumheller, Calgary, Lethbridge, Medicine Hat and Cardston. In Sask. Pr. Albert, Melfort, Saskatoon, Wynyard, Weyburn and Estevan. Most of Manitoba Plain, Interlake area. Most of Eastern Ontario. Northern Clay Belt, Lac St. Jean, Appalachian Valleys, Riv. du Loup, Southern N.B., N.S. and P.E.I.
- CLIMATE E In Alta: Rocky Mt. House, Edson, Barrhead, rest of Peace R. W. Sask: Meadow L., Battleford, Rosetown, Maple Creek, S. Current, Moose J., Regina, Tisdale-Hudson Bay area. Manitoba: Riding and Duck Mtns. Algonquin Pk. in Ontario. Quebec: Abitibi, Laurentides, Gaspé, North N.B. Highlands and Nfld.

## Trends in Land Use

Trends in land use in Canada can be discussed usefully within two general categories: trends in the total area of land used for farming purposes, and trends in the proportion of farm land devoted to different crops. Between 1951 and 1971, there was a marked decline in total farmland in Eastern Canada (Table 3.7) which was largely offset by an expansion of land for farming in the prairies and British Columbia. The decrease in land used for farming in Eastern Canada was largely attributable to changing economic conditions which saw a disappearance of local markets and a consolidation of farms to take advantage of modern machinery. Marginal land in poorer climates was often abandoned. The decline in farmland in Ontario also reflects the increased use of land for urban expansion.

The expansion of farmland in the prairies and British Columbia represented a continuation of previous efforts to exploit Canada's untapped agricultural resources. Indications are that continual expansion in these regions will be slower than in the past. Indeed, because of soil and climate limitations on remaining resources, there may be little or no expansion in the near future.

Table 3.7 CHANGES IN TOTAL AND IMPROVED FARMLAND BY PROVINCE, CANADA, 1951 and 1971

| | Total Farmland | | | Improved Farmland | | |
|---|---|---|---|---|---|---|
| | 1951 | 1971 | Change | 1951 | 1971 | Change |
| | - 000 hectares- | | % | - 000 hectares - | | % |
| B.C. | 1,903 | 2,356 | 19.2+ | 465 | 710 | 34.5+ |
| Alta. | 17,992 | 20,034 | 10.2+ | 9,013 | 11,517 | 21.7+ |
| Sask. | 24,954 | 26,328 | 5.2+ | 15,705 | 18,788 | 16.4- |
| Man. | 7,175 | 7,692 | 6.7+ | 4,355 | 5,182 | 16.0+ |
| Ont. | 8,450 | 6,460 | 23.6- | 5,137 | 4,397 | 14.4- |
| Que. | 6,793 | 4,371 | 35.7- | 3,573 | 2,610 | 27.0- |
| N.B. | 1,404 | 542 | 61.4- | 407 | 197 | 51.6- |
| N.S. | 1,284 | 538 | 58.1- | 268 | 156 | 41.8- |
| P.E.I. | 443 | 314 | 29.1- | 261 | 200 | 23.4- |
| Nfld. | 70,434 | 25 | 26.5- | 12 | 8 | 33.3- |
| Canada | | 68,663 | 2.5- | 39,195 | 43,766 | 10.4+ |

Source: Agriculture Canada, Pub. 76/10.

Trends in the use of farmland are often unclear because of short-term shifts in area due to product price changes. Some of the more noticeable trends in the 1960's and early 1970's include:

- increase use of corn, in place of hay, for fodder in most of Eastern Canada
- increased use of corn for grain, partially in place of small grains, in Ontario.

- expansion of oilseeds in the Prairie Provinces, often at the expense of oats and wheat
- increased area of barley in all provinces, usually in place of oats or mixed grains
- decreased emphasis on wheat in the prairies in the late 1960's with a subsequent resurgence in the mid-1970's.

The shift from wheat to feed grains during the late 1960's was a reflection of changed grain-livestock price ratios. Recent reversals of these changes resulted in a revitalized interest in wheat.

### 3.2.5 Competing Uses for Agricultural Land

In the early part of the twentieth century, agricultural land was still a relatively plentiful commodity in Canada, especially in the Prairie Provinces. It was not until after World War II that traditional agriculture began to feel economic pressures on its land base from non-farm uses. These pressures mounted rapidly during the 1960's and 1970's, especially in agricultural areas close to the large population centres of Vancouver, the Toronto-Hamilton (or Golden Horseshoe) area, and Montreal.

Modern urbanized society requires substantial quantities of land for purposes unheard of less than half a century ago. Airports, railway yards, large factory complexes, residential suburbs, parks, highways, and many other uses are essential components of metropolitan areas. Thus, not only has the Canadian populations become concentrated in a few major urban centres, but the land requirement per thousand urban dwellers has been growing steadily. Accurate data on the rate of loss of farmland to urban use are not available, but estimates of the area of land absorbed for every increase of 1000 in urban population vary from about 10 to 400 hectares. The higher figure includes urban fringe land alienated from agriculture by land speculation and resulting high prices. If the value of 80 hectares per 1000 increase of urban population is used, the projected permanent conversion of land to urban development in Quebec and Ontario between now and the year 2000 are 300,000 hectares and 500,000 hectares respectively.

Canada's major urban areas are located in almost exactly the same areas as Canada's best agricultural land. This is not surprising for these centres have grown from the most prosperous settlements of our forefathers, and these, in turn, were located where the climate was most favourable and food supplies could be most readily obtained. Approximately two-thirds of Canada's urban population is located on land which has the most favourable climates for farming (classes 1 to 3 of Table 3.5). Some idea of the ability of non-farm uses to out-compete farming for land can be had by comparing land prices in British Columbia and Ontario with those for

Canada as a whole. In 1976, average farm land values in British Columbia and Ontario were $1,430 and $2,090 per hectare respectively, while average values in other provinces ranged from $395 to $713. Even traditionally rural areas are finding that hydro lines, highways, parks, gravel pits, and other non-farm uses of land are becoming more numerous and using larger areas than before. Thus, significant conflicts between farm and non-farm uses of land have developed in basically farming areas such as western Ontario and southern Alberta.

Much of the land with some potential for agriculture which is currently not farmed is either forested or idle land. While as such, it may have some value as forest, wilderness, or park land, this value is relatively low on a per hectare basis. However, the costs of clearing and breaking, together with a low economic return in agriculture (at current farm product prices) discourage incorporating it in the farmland base at the present time. Indeed, for parts of Eastern Canada, as noted earlier, returns to some land in agriculture have been so low in recent decades that revision to forestry has apparently been profitable.

### 3.2.6 Environmental Problems

Environmental concerns related to land and water used for agricultural purposes fall into three general categories: (1) problems originating in other areas or sectors in the economy but which influence agricultural production; (2) problems created within agriculture and also influencing agriculture; (3) problems originating within agriculture but influencing other areas or sectors.

Problems in the first category do not appear to be numerous or of major significance at present. Nevertheless, some land and water used for agricultural purposes has undoubtedly been adversely affected by wastes from mining and industrial production. This will undoubtedly become a more significant concern in the future. Some major environmental concerns are, however, largely unrelated to agriculture. For example, air pollution from major urban centres does not appear to have any significant effect on surrounding agricultural land or water.

Problems in the second category include erosion (wind and water), flooding, stream contamination by silt, and possible residues of chemicals in the soil. Erosion, flooding, and related problems have usually resulted from substantially changing the natural state of the land in converting it to farm use. Removal of forests in Eastern Canada and the ploughing up of prairie grassland severely affected the natural ability of the land to cope with precipitation. Resultant problems gave rise to the creation of Prairie Farm Rehabilitation Administration in Western Canada and a variety of other programs elsewhere. Ontario has a substantial

Conservation Authority program which allows municipalities to group together to deal with erosion, flooding and related problems on a watershed basis. The possibility of chemical residues in the soil eventually adversely affecting farm production is guarded against in the process of licensing such chemicals for farm use. Some such chemicals are used on specific crops (e.g., atrazine on corn) because their effects are short-term in nature. Salinization of soils in irrigation districts is another example of an environmental problem created for agriculture by attempting to harness natural land and water resources to farm production.

Flooding is an example of a problem created within agriculture and affecting other sectors. Lack of natural vegetation in some areas has permitted lakes and streams to rise substantially above their natural level during spring run-off. This in turn has created a problem for downstream towns and cities which often must build flood control canals or take other precautionary measures to cope with it.

## 3.3 CAPITAL RESOURCES

Capital employed in the primary production sector of Canadian agriculture is typically categorized into three classes - land and buildings, machinery and equipment, livestock and poultry. The first of these classes includes both the natural land base plus man-made improvements. It's value, therefore, includes elements of both the capitalized value of the land *per se* and the cost, less accumulated depreciation, of buildings and land improvements. Machinery and equipment is largely purchased by the farm sector from non-farm industries. Its value typically reflects cost less accumulated depreciation. Livestock and poultry, on the other hand, represent both inventories of products for sale and the basic herd required to produce them. Their values are largely determined by current market conditions for the corresponding products. Crop inventories and quota investments are two additional elements in farm capital structure but for which complete value statistics are not usually available. The latter, while perhaps not a productive investment from an industry point of view, is certainly a strong competitor for investment funds as far as the individual farmer is concerned.

As land represents a major component of farm capital, it is not surprising that the largest share of farm capital investment is found in the Prairie Provinces. However, because of the nature of farm production in the prairies, the ratio of capital to land is less than in Central Canada. Not only are land values *per se* typically lower in the prairies, but building values for a given land area are usually less, and greater emphasis on cash cropping implies lower livestock investments.

Table 3.8 TOTAL FARM CAPITAL VALUE, CANADA, SELECTED YEARS, 1951 to 1975

| Period | British Columbia | Prairie Region | Ontario | Quebec | Atlantic Region | Canada |
|---|---|---|---|---|---|---|
| | | | - million dollars - | | | |
| 1951 | 408 | 4,699 | 2,548 | 1,399 | 417 | 9,471 |
| 1961 | 657 | 6,737 | 3,742 | 1,625 | 411 | 13,171 |
| 1966 | 949 | 10,884 | 4,884 | 1,884 | 474 | 19,075 |
| 1971 | 1,594 | 12,780 | 6,897 | 2,200 | 538 | 24,068 |
| 1975 | 3,094 | 21,641 | 13,304 | 3,586 | 906 | 42,531 |

Source: Agriculture Division, Statistics Canada.

The total nominal value of farm capital in Canada between the years 1951 and 1971 increased from $9.5 to $42.5 billion (Table 3.8). The rate of capital accumulation was fairly rapid during the five-year period 1961-66 (Table 3.9), followed by a slowdown between 1966 and 1971. The slowdown was directly related to declining land values resulting from reduced profitability of grain farming. Between 1971 and 1975, the total farm capital value again increased rapidly in association with good grain crops and improved markets for grain stocks. The increase in total values in Quebec and the Atlantic regions between 1961 and 1971 was less than half the increase observed in other regions of Canada. Capital values in British Columbia almost tripled during this period.

Table 3.9 GROWTH IN TOTAL NOMINAL FARM CAPITAL VALUES, CANADA, SELECTED YEARS, 1951 to 1975

| Period | British Columbia | Prairie Region | Ontario | Quebec | Atlantic Region | Canada |
|---|---|---|---|---|---|---|
| | | | - percent - | | | |
| 1951-61 | 61.0 | 43.3 | 46.9 | 16.1 | -1.4 | 39.1 |
| 1961-66 | 44.4 | 61.6 | 30.5 | 15.9 | 15.3 | 44.8 |
| 1966-71 | 67.9 | 17.4 | 41.2 | 16.8 | 13.5 | 26.1 |
| 1971-75 | 94.1 | 70.2 | 93.6 | 65.4 | 68.4 | 78.0 |

Source: Agriculture Division, Statistics Canada.

As one would expect, there have also been marked changes in the composition of the capital stock in agriculture between 1951 and 1971. For example, land and buildings as a proportion of total farm capital increased from 58.4 percent in 1951 to 70.8 percent in 1971, subsequently declined to 68.8 percent in 1973, only to be followed by a substantial increase to 75.5 percent in 1975. The proportion of farm capital invested in implements and equipment has declined steadily from 20.4 percent in 1951 to 14.2 percent in 1974,

with a small increase to 15.0 percent in 1975. Thus, while substantial investments in implements and machinery have been made, these have not been sufficient to keep total capital in this category growing at the same rate as the land and buildings category.

There has also been a marked decline in the proportion of capital devoted to livestock and poultry during the period 1951-75. In 1951, 21.2 percent of the total capital was invested in livestock; in 1975, this was down to 9.5 percent. Such variability reflects the relationship between this investment category and farm product prices. As with machinery and equipment, growth in this investment category has not kept pace with growth in farm real estate capital. As a consequence, investment in livestock, which had been running between 12 and 16 percent of the total between 1961 and 1974, fell below 10 percent in 1975 (Table 3.10).

Table 3.10 DISTRIBUTION OF TOTAL PER FARM CAPITAL BY USE, CANADA, SELECTED YEARS, 1951 to 1975

| Year | Total | Land and Buildings | Implements and Machinery | Livestock and Poultry |
|---|---|---|---|---|
| | | - percent - | | |
| 1951 | 100.0 | 58.4 | 20.4 | 21.2 |
| 1961 | 100.0 | 65.5 | 19.5 | 15.0 |
| 1966 | 100.0 | 69.1 | 18.6 | 12.3 |
| 1971 | 100.0 | 70.8 | 16.3 | 12.8 |
| 1972 | 100.0 | 69.1 | 16.2 | 14.7 |
| 1973 | 100.0 | 68.8 | 14.6 | 16.6 |
| 1974 | 100.0 | 71.9 | 14.2 | 13.8 |
| 1975 | 100.0 | 75.5 | 15.0 | 9.5 |

Source: Agriculture Division, Statistics Canada.

### 3.3.1 Buildings and Land Improvements

Canadian farm buildings comprise a wide variety of structural types and range from new or well-maintained units to some that are obsolete and in very poor repair. These buildings serve a number of functions in livestock housing, storage, production and service activities (Table 3.11). Through the past 20 years, farm structures have been extensively upgraded to improve environmental control and provide mechanized and automated services to housed livestock or stored products. The greatest technological developments have occurred in intensive livestock housing, particularly with poultry and swine. Modern Canadian farm structures are highly specialized in function, although the basic form and exterior structures are becoming standardized for economy. Machinery storages are exceptions to this specialization in that they are used alternatively for grain storage, particularly in the Prairie Provinces.

Table 3.11 PRESENT VALUE OF FARM BUILDINGS, CANADA, 1976[a]

| | ($ million) |
|---|---|
| Livestock Housing | |
| Cattle | 1,589 |
| Pigs | 356 |
| Sheep | 23 |
| Horses | 320 |
| Poultry | 470 |
| Mink | 5 |
| TOTAL | 2,763 |
| Forage and Grain Storage | |
| On farm grain storage | 400 |
| Hay and haylage | 179 |
| Fodder corn (silos) | 157 |
| TOTAL | 736 |
| Fruits and Vegetables | |
| Potatoes | 21 |
| Carrots | 3 |
| Apples | 9 |
| Peaches | 1 |
| TOTAL | 34 |
| Greenhouses | |
| Glass | 53 |
| Plastic | 6 |
| TOTAL | 59 |
| Tobacco | |
| Kilns and heating | 25 |
| Pack barns | 18 |
| Tobacco greenhouses | 14 |
| TOTAL | 57 |
| Machinery Storage and Repair Shops | |
| Farm repair shops | 90 |
| Machine sheds | 280 |
| Maintenance tools | 200 |
| TOTAL | 570 |
| Honey and Maple Products | |
| Hires, evaporators, etc. | 44 |
| TOTAL | 44 |
| Total present value of farm buildings | 4,253 |

[a]Table constructed using 1971 Census statistics to obtain numbers of livestock. Estimates were then made to calculate the average square footage required to house the livestock. In the case of all other kinds of farm buildings, this footage was available. The averages were then multiplied by their respective present day construction costs, less depreciation costs accounting for average age of the buildings, to arrive at their present value unequipped.

Source: Engineering Research Service, Agriculture Canada.

Without environmental control and materials handling systems, the present high levels of production and labour efficiency with dairy cattle, laying chickens and growing swine, for example, could not be attained. Likewise, without properly designed storages, heavy losses would occur to stored grains and Canadian consumers would in winter and spring be totally dependant on fruits and vegetables imported from warmer climates.

Because of significant differences in livestock production between Eastern Canada and Western Canada, 70 percent of the capital invested in livestock buildings is found in Eastern Canada. This is due primarily to the high concentration of poultry, dairy and hog production in the east; these operations require better environmental control and automation with resulting higher building investments. On the other hand, beef production predominates in the west, and economic western housing for beef at most consists of relatively simple shelters and windbreak fencing.

Total investment in new farm residential construction for 1971 amounted to $298 million, while for non-residential construction it amounted to $216 million in the same period. Updating this to 1976 amounts to approximately $500 million for non-residential construction, which is equivalent to approximately one-half of the investment in the same year for new farm tractors, machinery and spare parts.

Although some capital resources are used for land improvements such as fencing, land clearing, and erosion control, the majority are used for drainage of imperfectly and poorly drained soils in the humid regions of Canada east of the Great Lakes and near the British Columbia coast. Drainage improvements are essential for crop production on an estimated 3.2 million hectares of these soils. For the most part, the major drainage outlet works have been constructed, but considerable subsurface drainage remains to be done. Although no single information source on the extent of past, current or future drainage work is available, it is estimated that prior to 1964, the extent of subsurface drainage was 825,000 hectares today, the total is estimated at 1.5 million hectares which indicates that less than one-half of the required drainage work has been accomplished. However, some land already drained undoubtedly requires additional subsurface drainage, and some older drainage systems will require re-construction. Over 90 percent of this drained area is in Ontario of which 30 percent has been developed in the past ten years. Drainage developments in Quebec have occurred at an even greater rate, namely, tenfold increase in ten years. The current annual capital expenditure for subsurface drainage installation in Canada is approximated at $40 million.

### 3.3.2 Machinery and Equipment

Nearly every farm operation and materials handling chore is (or can be) mechanized to some extent. Machinery may be used to perform the work entirely (e.g., combines for harvesting) or to reduce the physical effort and discomfort for the labourer (e.g., picking aids for fruit). The level of technology embodied in farm machinery has increased rapidly in the last two decades but, as farm machinery has little salvage value outside of the industry, many machines of five, ten, or even twenty-year vintage are still in use.

The total value of machinery on farms in Canada increased from $2,566 million in 1961 to $5,137 million in 1974. In real terms (i.e., adjusted for general inflation), this represented an increase of 23 percent. While this is reflective of the substitution of capital for labour which has been occurring in the industry, the total real increase for the industry is small relative to capital growth observed in some other sectors where total output has been growing at a more rapid rate.

The amount of equipment owned by the farmers varies substantially by type. Some types of equipment are found in virtually all farms and some farms will have several units (Table 3.12). Tractors, combines, automobiles, trucks and hay balers are the most numerous of all machines. Fruit picking and vegetable harvesting machinery is very specialized and found on relatively few farms.

Table 3.12 MACHINERY AND EQUIPMENT ON CENSUS FARMS, CANADA, 1971

| Item | Number | Farms Reporting |
|---|---|---|
| Automobiles | 324,397 | 276,857 |
| Motor Trucks | 369,849 | 247,871 |
| Tractors | 596,698 | 320,709 |
| Combines | 162,751 | 151,142 |
| Hay balers | 152,832 | 150,641 |

Source: Statistics Canada, Cat. 96-720.

In 1975, the wholesale value of machinery and equipment purchased by farmers amounted to nearly $1.0 billion (Table 3.13). Four categories of equipment accounted for over 75 percent of this expenditure - tractors, harvesting equipment, plows and tillage machinery, and haying machinery. Innovations in all categories have occurred frequently and annual modifications to improve the capability of specific machines are not unusual. However, the most noticeable trend is to larger sizes. The largest size of tractor available today, for example, is roughly twice as large as a decade ago.

Table 3.13 FARM MACHINERY SALES BY GROUPS AT WHOLESALE PRICES, CANADA, 1975

| Type | Million |
|---|---|
| Tractors | 373.3 |
| Harvesting machine | 181.8 |
| Plows & tillage machine | 103.9 |
| Haying machine | 65.0 |
| Pump & irrigation | 57.2 |
| Processing | 50.4 |
| Planting | 39.5 |
| Wagons, etc. | 35.6 |
| Barn equipment | 30.3 |
| Dairy equipment | 19.0 |
| Spraying & dusting | 10.3 |
| TOTAL | 966.3 |

Source: Statistics Canada, Cat. 63-203

The trend to larger machines is reflected in tractor sales (Table 3.14). Two-wheel drive tractors have shown only modest percentage sales increases in recent years, while four-wheel drive, and especially those of 200 HP and greater, have shown substantial percentage increases. The introduction of large bales (about 450 kg) represents an innovation in hay handling which requires a larger machine but is increasing labour productivity. The use of larger machines for planting and harvesting crops implies that the size of farm (in area) which one man can handle will increase correspondingly.

Table 3.14 SALES OF SELECTED EQUIPMENT BY NUMBER OF UNITS, CANADA, 1973, 1974 & 1975

| Equipment | 1973 | 1974 | 1975 |
|---|---|---|---|
| All Tractors | 28,758 | 29,995 | 32,665 |
| All two-wheel drive | 27,313 | 28,233 | 29,860 |
| All four-wheel drive | 1,445 | 1,762 | 2,805 |
| 4WD, 200 HP & over | 600 | 950 | 1,389 |
| ROPS Cabs | - | 7,615 | 11,231 |
| Hay Balers - Hand portable | 7,610 | 6,960 | 6,686 |
| - Large round | - | 214 | 2,254 |
| Hay Stacking Wagons | - | 1,026 | 700 |
| Forage Crop Harvesters (all types) | 2,382 | 3,175 | 3,206 |
| Combines - S.P. | 3,930 | 3,749 | 4,144 |
| - P.T.O. | 1,751 | 1,094 | 1,968 |

Source: Statistics Canada, Cat. 63-203

The level of mechanization possible varies substantially among production processes. Some processes can be, and already have been highly mechanized - grain production and poultry raising are examples. Other processes do not lend themselves as readily to mechanization. Fruit harvesting and some aspects of handling livestock either require special

skills or dexterity which is hard, or perhaps impossible, to duplicate with a machine. In order to facilitate mechanization of fruit and vegetable handling, research on new varieties and hybrids often gives specific attention to developing products more amenable to machine handling.

### 3.3.3 Livestock and Poultry

Capital invested in livestock and poultry by Canadian farmers has grown from about $2 billion 1951 to slightly more than $4 billion in 1976 (Table 3.15). In real terms, this represents an increase of less than 10 percent even though numbers in the major classes of livestock have trended upwards over time.

Annual value of livestock on hand tends to fluctuate over time because of variations in both price and quantity. Price fluctuations of inventories are closely related to variations in prices of livestock sold, while quantities reflect farmers' efforts to adjust to these same market conditions. For example, total livestock investment changed little between 1951 and 1961 while swine investment declined and cattle investment increased (Table 3.15). However, there has been a noticeable trend over the last 25 years for a greater share of livestock capital to be concentrated in cattle as opposed to other classes of livestock. Cattle currently account for about 90 percent of the value of livestock on hand in Canada.

Cattle, swine, and poultry have all shown increases in numbers on hand over time (Table 3.16), although both of the latter two categories show decreases between 1971 and 1976. This is largely attributable to changing grain-livestock price ratios during this period. Sheep and goats on farms have decreased both in values and numbers over time. This reflects the declining importance of these enterprises in Canadian farming.

Regionally, the largest share (56 percent) of Canadian cattle investment is concentrated in Ontario and Quebec (Table 3.17). Swine investment is divided roughly equally between Eastern and Western Canada. At any point in time, the geographic distributions of livestock investment and livestock numbers are essentially the same, although per unit values do vary slightly among regions depending on livestock quality and distance from markets. British Columbia and the Atlantic Provinces together account for less than 10 percent of the total investment in livestock in Canada.

Perhaps one of the most significant features of the capital investment in livestock and poultry in Canada is that, while the quality of the national herd has certainly increased significantly over the last 25 years, especially for the major classes of livestock, real per unit values have

actually fallen. For example, the real value of cattle per head fell by about 40 percent between 1951 and 1971 while the real value of swine per head fell by about 70 percent in the same period. This, of course, simply reflects increased production efficiency within the agricultural sector.

Table 3.15 VALUE OF LIVESTOCK ON HAND, CANADA, SELECTED YEARS, 1951 to 1976

| | 1951 | | 1961 | | 1971 | | 1976[a] |
|---|---|---|---|---|---|---|---|
| | $ million | % | $ million | % | $ million | % | $ million |
| Cattle | 1,596 | 79 | 1,646 | 83 | 2,755 | 87 | 3,659 |
| Poultry | 91 | 5 | 97 | 5 | 150 | 5 | 193 |
| Swine | 186 | 9 | 144 | 7 | 176 | 6 | 381 |
| Sheep & Goats | 40 | 2 | 25 | 1 | 20 | .6 | 12[b] |
| Horses | 95 | 5 | 68 | 4 | 56 | 1.8 | NA |
| Total | 2,008 | 100 | 1,980 | 100 | 3,157 | 100 | NA |

[a]Excludes Newfoundland.
[b]Excludes goats.
Source: Statistics Canada, Cat. 96-701.

Table 3.16 NUMBERS OF LIVESTOCK ON HAND, CANADA, SELECTED YEARS, 1951 to 1976

| | 1951 | 1961 | 1971 | 1976[a] |
|---|---|---|---|---|
| Cattle | 8,371 | 11,941 | 13,278 | 14,676 |
| Swine | 4,916 | 5,333 | 8,107 | 5,504 |
| Poultry | 67,934 | 77,995 | 98,050 | 94,240 |
| Sheep & Goats | 1,496 | 1,587 | 878 | 343[b] |
| Horses | 1,306 | 512 | 354 | NA |

[a]Excludes Newfoundland.
[b]Excludes goats.
Source: Statistics Canada, Cat. 96-701.

## 3.4 HUMAN RESOURCES

Canadian agriculture has traditionally been dominated by family farm businesses, both in terms of numbers of farm units and the share of total output of virtually all commodities produced by such units. The labour and management of these farms has, to a very substantial extent, been supplied by the farm operator and his family. However, for several decades the total labour utilized on Canadian farms has declined steadily as capital, in the form of modern field machinery and materials handling equipment, has been introduced into the industry at a rapid rate.

During the period 1961-71, total employment (operator and hired labour) in Canadian agriculture declined from 744 thousand to 612 thousand, a decrease of 18 percent (Table

Table 3.17 VALUE OF LIVESTOCK ON HAND BY REGION, CANADA, 1971

| | Atlantic | | Quebec | | Ontario | | Prairies | | B.C. | | Canada | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $ mil. | % | $ mil. | % | $ mil. | % | $ mil. | % | $ mil. | % | $ mil. | % |
| Cattle | 64.2 | 2.3 | 357.4 | 13 | 663.8 | 24.1 | 1,551.7 | 56.3 | 117.3 | 4.3 | 2,754.5 | 100 |
| Poultry | 8.4 | 5.6 | 35 | 23.4 | 57.3 | 38.3 | 34.4 | 23 | 14.3 | 9.6 | 149.4 | 100 |
| Swine | 6.3 | 3.6 | 33.7 | 19.1 | 52.1 | 29.5 | 82.3 | 46.7 | 1.9 | 1.1 | 176.4 | 100 |
| Sheep & Goats | 1.4 | 7 | 1.9 | 9.5 | 6.1 | 30.5 | 9.1 | 45.5 | 1.5 | 7.5 | 20 | 100 |
| Horses | 2.3 | 4.1 | 9.2 | 16.3 | 16.2 | 28.9 | 23.1 | 41.2 | 5.3 | 9.4 | 56.1 | 100 |
| Total | 82.6 | 2.6 | 437.4 | 13.9 | 795.6 | 25.2 | 1,700.8 | 53.9 | 140.4 | 4.4 | 3,156.8 | 100 |

Source: Statistics Canada, Cat. 96-701.

3.18). The largest reductions occurred in Ontario and the prairie region which traditionally account for over 70 percent of total farm employment. The downward trend was reversed slightly and temporarily in 1974 and 1975 due primarily to increased employment of hired labour in some regions. During the period 1951-71, the total farm population declined from 2.9 million to 1.5 million, representing from 20.8 to 6.9 percent of the total population. These decreases have had a significant impact on the character of many rural communities.

The decreased utilization of human resources within the farm sector has been associated with rapid increases in labour productivity in farming. Labour productivity in agriculture is higher than the average of other sectors (Table 3.19) on both a per person and per man-hour basis. Real Domestic Product per person in agriculture increased from $1,805 in 1951 to $2,323 in 1961 and $4,235 in 1974. Such increases in labour productivity have exceeded those experienced in the non-farm sector.

Increases in labour productivity and the associated overall decline in agricultural employment have been possible, not only because of the increased use of capital, but also because of the upgrading of technical and managerial skills of farm workers, especially owner-operators. This is, in part, reflected in the level of education of the agricultural labour force. In 1971, more than 34 percent of the agricultural labour force had some secondary schooling compared with only 21 percent in 1951.

While the total agricultural labour force has declined in numbers, there has been a gradual shift towards greater reliance on hired labour. In 1951, farm operators represented 46 percent of all those persons employed in farming. By 1971, this had declined to 42 percent. Unpaid family workers accounted for 38 percent and 30 percent respectively in these same years. The residual (16 percent and 28 percent) was supplied by hired workers.

Perhaps one of the most significant characteristics of farm operators as a group is their wide variability in applied and managerial skills. In terms of formal education, this varies from less than completion of public school to completion of diploma, degree, and even post-degree courses in agriculture. While statistical information is not available on this topic, it is believed that the proportion of Canadian farmers with some formal technical agricultural training is steadily increasing. Manpower training programs have also provided short course training to a significant number of farmers during the last ten years. In terms of the type

Table 3.18 EMPLOYMENT IN AGRICULTURE, CANADA, 1951, 1961 & 1971

| | 1951 | 1961 | 1971 |
|---|---|---|---|
| Farm Operators[a] | | | |
| Full-time | 449,258 | 327,228 | 236,841 |
| Part-time[b] | 135,558 | 112,352 | 87,175 |
| Other full-time[c] | 36,534 | 41,323 | 42,112 |
| Total | 621,350 | 480,903 | 366,128 |
| Hired Labour[d] | | | |
| Full-time[e] | 89 | 101 | 95 |
| Seasonal[f] | 129 | 162 | 161 |
| Total | 218 | 263 | 246 |
| Unpaid Family Workers[d] | | | |
| Full-time[e] | 199 | 118 | 107 |
| Seasonal[f] | 307 | 188 | 151 |
| Total | 506 | 306 | 258 |

[a]Includes Yukon and Northwest Territories.
[b]1 to 228 days of off-farm work.
[c]229 to 365 days of off-farm work.
[d]Excludes Yukon and Northwest Territories.
[e]Generally, December figures are used to determine a full-time occupation. For purposes of consistency though, November figures were used here because December ones were not available for 1951.
[f]Seasonal is defined as those being employed in August (peak month) and may be considered as part-time labour.

Source: Statistics Canada, Cat. 71-001.

Table 3.19 INDEXES OF LABOUR PRODUCTIVITY, COMMERCIAL NON-AGRICULTURAL INDUSTRIES AND AGRICULTURE, CANADA, SELECTED YEARS, 1951 to 1975

| | Commercial Non-agricultural | | Agricultural | |
|---|---|---|---|---|
| | Output per person | Output per man-hour | Output per person | Output per man-hour |
| | 1961 = 100 | | | |
| 1951 | 73.6 | 69.9 | 77.7 | 77.4 |
| 1954 | 81.0 | 78.6 | 71.5 | 68.4 |
| 1961 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1964 | 110.2 | 110.4 | 133.9 | 138.6 |
| 1971 | 135.1 | 143.0 | 203.9 | 217.0 |
| 1974 | 140.7 | 150.1 | 182.3 | 190.5 |

Source: Statistics Canada, Cat. 14-201.

of farm business operated, it is clear that large feedlots (5-10,000 head), laying operations (50,000 birds), dairy enterprises (200 cows), and cash crop farms (up to 8,000 hectares) require substantially different managerial skills than those required for the 50-hectare farm with a few cows, pigs and sheep. And yet both of these extremes and many farms lying in between are still found in Canadian agriculture, even though the very small mixed operation is rapidly disappearing. While management capacity seems to be closely correlated with the educational level of the farm operator, a high level of education neither assures managerial success nor is an absolute prerequisite for it.

### 3.4.1 Farm Operators

The decline in the number of farm operators observed over the period 1951-1971 - from 621 thousand to 366 thousand has occurred largely as a result of reduced entry into the industry as older operators have retired. During the period 1961-1971, there was a net exit of 173,360 farmers over the age of 45 and a net entry of only 58,585 farmers younger than 45. This accounts for the skewed age distribution of

farmers (Table 3.20) which has been the topic of much public concern in recent years.

Farmers who have not been aggressive in expanding their operations and utilizing the latest available technology have faced declining farm incomes due to changed input-output price ratios, commonly referred to as the cost-price squeeze. However, their ability to move off the farm into other industries is limited by their levels of education and the fact that skills acquired on the farm are not in wide demand in non-farm industries. Off-farm migration is also affected by external forces such as regional levels of industrial development and unemployment rates in job categories to which farm workers can feasibly transfer. Age is a major determinant of mobility between farm and non-farm occupations. As farmers become older, there is less psychological incentive to move and the financial costs associated with the move are often substantially increased, especially if re-training must be undertaken. Movement of some workers off the farm with a later return to agriculture is not uncommon and the utilization of full-time or part-time non-farm employment while retaining the farm as either a place of residence, or a modest business enterprise, or both has been increasingly popular. Indeed, the latter solution has also appealed to some urbanites who are dissatisfied with their urban life-style. Thus, current statistics on farm operators include significant numbers of part-time and hobby farmers with quite satisfactory earnings in non-farm activities. In 1974, estimates based on farm taxfiler data show the following:

| | | |
|---|---|---|
| Commercial farmers with adequate incomes | 136,011 | 34.8 |
| Hobby and part-time farmers with adequate incomes | 111,730 | 28.6 |
| Small farmers with inadequate incomes | 79,367 | 20.3 |
| Rural residents (who filed taxes) with inadequate incomes | 63,408 | 16.2 |
| TOTAL | 390,516 | 100.0% |

Note: 'Adequate Income' is considered to be an income above Statistics Canada poverty levels (taking into account family size). Both 'commercial' and 'small' farmers include persons deriving more than 50 percent of their income from farming.

Immigrants have made a significant contribution to the resource base of farm operators now existent in Canada. During the early part of this century, large numbers of agriculturally-oriented immigrants from Scandinavia and the Ukraine flooded into Western Canada to add to the Canadian farm population which was at that time dominated by recently-arrived English, Irish and Scottish settlers in Ontario, the French of Quebec, and the Scottish and English of the Atlantic Provinces. In more recent years, following World War II,

another flow of immigrants from Western Europe brought new ideas and skills to the Canadian farm scene. While all of these groups have now been integrated into the Canadian scene, the attitudes and skills which these people brought with them have a been significant force in moulding the present farm operator resource base. An example of this is the thrifty character and sound technical farming skills of many Dutch immigrants who arrived in Ontario shortly after World War II and who now comprise (either themselves or their sons and daughters) a significant share of that province's dairy farmers. For many farm families, this pattern has been thwarted in recent years because of the trend to larger and more capital-intensive units. Instead of the son taking over the father's farm, he has often turned to non-farm work on a full or part-time basis. Nevertheless, it still appears that the large majority of young farmers who do enter the industry come from a farm family background and many take over a family farm. Their sound practical experience has, in part, compensated for the low level of formal technical training in agriculture among farm operators. However, it has also often limited the scope of many young farmers to farming in the ways of their father who did not have available to him all of the farming technology of the 1960's and 1970's.

Table 3.20 AGE AND EDUCATION CHARACTERISTICS OF FARM OPERATORS, CANADA, 1951, 1961 and 1971

| Average Age | 1951 | 1961 | 1971 |
|---|---|---|---|
| | | - percent - | |
| Under 25 | 3.5 | 2.6 | 2.4 |
| 25-34 | 18.2 | 14.2 | 12.8 |
| 35-59 | 58.7 | 62.7 | 64.5 |
| Over 60 | 19.6 | 20.5 | 20.4 |
| Education | | | |
| Less than Gr. 9 | 75.9 | 68.1 | 48.2 |
| Grade 9 to 11 | 22.2 | 28.6 | 34.8 |
| Grade 12 or more | 1.9 | 3.3 | 17.1 |

Source: Statistics Canada, Census of Agriculture, 1951, 1961 and 1971.

### 3.4.2 Hired Farm Workers

While commercialization of agriculture has increased, the demand for hired labour among certain types and sizes of farms, the substitution of capital for labour and the reduction in the number of farms has had the opposite effect for the industry as a whole. Since 1951, employment of hired farm labour has been relatively constant. However, hired labour has been the only component of total employment to register any net growth, increasing from 99 thousand in 1951 to 109 thousand in 1975. Many hired workers are employed on a seasonal basis creating large monthly fluctuations in

employment. These fluctuations have been consistent in magnitude over the years indicating that the ratio of seasonal to permanent farm labour has remained constant (Table 3.21).

Hired labour requirements for the farm sector can be divided into two categories, unskilled and skilled or semi-skilled. Requirements in the first category are largely seasonal although there are also seasonal demands for foremen and large machine (e.g., combine) operators at planting and harvest time. The first of these categories has traditionally dominated the farm labour scene. In recent years, the need for skilled herdsmen, mechanics, machine operators, and, in some instances, farm managers, has increased.

As unskilled labour is not, to any great extent, industry-specific, the human resource base for it depends, to a very substantial extent, on the alternative opportunities available to unskilled workers in other sectors. Traditionally, students and unemployed workers from industry (often recent immigrants) together with native or Metis workers provided the bulk of the seasonal work force.

Another source of seasonal labour within agriculture has been from families themselves. It has not been uncommon for young Ontario farm lads and some of their fathers as well to seek employment in the harvest season in Western Canada, this; however, this seems to be on the decline.

Table 3.21 MINIMUM AND MAXIMUM MONTHS OF HIRED FARM LABOUR, CANADA, SELECTED YEARS, 1953 to 1974

| | Minimum monthly employment | Maximum monthly employment |
|---|---|---|
| | - thousand - | |
| 1953 | 75 | 166 |
| 1954 | 79 | 179 |
| 1963 | 67 | 165 |
| 1964 | 70 | 142 |
| 1973 | 67 | 147 |
| 1974 | 71 | 144 |

Source: Statistics Canada, Cat. 71-001.

Recent data on students, who supply much of the seasonal labour, indicate that fewer students have offered their services to agriculture each year (Table 3.22). However, students continue to provide 12 to 20 percent of seasonal farm employment. Another diminishing source of hired labour, both on a part-time and permanent basis, has been the new immigrants to Canada. In 1975, less than 1.9 percent of all immigrants cited agriculture as their occupation compared to 7.2 percent in 1957 (Table 3.23).

There are a number of government agricultural employment programs (Table 3.24). The Agriculture for Young Canadians Program (AYC), administered under the terms of the Federal-Provincial Agricultural Manpower Agreements, promotes agriculture to young Canadians as both a means of summer employment and a possible future career. In 1975, over 7,500 students obtained summer employment in Ontario, Manitoba, Alberta, and British Columbia through AYC.

With a growing demand, on the part of larger farm businesses, for skilled farm workers for permanent jobs, many farmers and industry officials have expressed concern over the apparent shortage of workers in this category. The apparent shortage appears to be attributable to a combination of factors including willingness of some farm employers to provide the wages, job security and fringe benefits available to workers with similar skill levels in industry, the tendency for workers with such skills to embark on a farming enterprise of their own, and the lack of training programs specifically-oriented to training workers in these areas.

Table 3.22 STUDENT EMPLOYMENT IN AGRICULTURE, CANADA, 1971 to 1975

| | May | June | July | August |
|---|---|---|---|---|
| | Total students in agriculture (000) | | | |
| 1971 | 70 | 80 | 121 | 124 |
| 1972 | 68 | 74 | 109 | 106 |
| 1973 | 66 | 74 | 107 | 107 |
| 1974 | 65 | 70 | 104 | 98 |
| 1975 | 62 | 78 | 102 | 105 |
| | percent of total agricultural employment | | | |
| 1971 | 12.7 | 14.7 | 19.8 | 19.8 |
| 1972 | 13.0 | 13.8 | 19.1 | 18.6 |
| 1973 | 12.9 | 14.4 | 19.2 | 19.3 |
| 1974 | 13.0 | 13.1 | 18.4 | 18.1 |
| 1975 | 12.1 | 14.6 | 17.9 | 18.1 |
| | percent of total student employment | | | |
| 1971 | 14.7 | 13.4 | 14.9 | 15.5 |
| 1972 | 14.0 | 12.2 | 12.3 | 12.4 |
| 1973 | 12.8 | 10.4 | 11.5 | 11.8 |
| 1974 | 11.6 | 10.2 | 10.4 | 9.7 |
| 1975 | 11.2 | 10.6 | 10.4 | 10.9 |

Source: Dept. of Manpower and Immigration, Employment in Agriculture, 1975.

Table 3.23 IMMIGRANTS INTENDING TO WORK IN AGRICULTURE, CANADA, SELECTED YEARS, 1957 to 1975

| | Number of immigrants | Immigrants Stating Agriculture as Intended Occupation | |
|---|---|---|---|
| | | number | percent |
| 1957 | 151,511 | 10,838 | 7.2 |
| 1960 | 53,573 | 5,321 | 9.9 |
| 1963 | 45,866 | 2,398 | 5.2 |
| 1966 | 99,210 | 3,153 | 3.2 |
| 1969 | 84,349 | 2,283 | 2.7 |
| 1972 | 59,432 | 2,127 | 3.6 |
| 1975[a] | 64,877 | 1,255 | 1.9 |

[a]First three quarters only.
Source: Department of Manpower and Immigration.

Table 3.24 GOVERNMENT AGRICULTURAL EMPLOYMENT PROGRAMS, CANADA, 1974 and 1975

| | 1974 | 1975 |
|---|---|---|
| Placements by Canada Manpower Centres | 75,031 | 56,352 |
| Placements by Canada Farm Labour Pools | 16,826 | 39,172 |
| Workers supplied by Caribbean Program | 5,342 | 5,584 |
| Workers supplied by Mexican Program | 195 | 382 |
| European Student Tobacco Workers (Ontario) | 1,332 | 1,172 |
| Workers supplied by International Youth Employment Exchange Program | 381 | 575 |

Source: Department of Manpower and Immigration.

In the past, few farm labourers have participated in agricultural training programs.

While some persons who like farm work may wish to avoid managerial responsibilities, there would appear to be a strong tendency for the person with good technical farming skills to prefer operating his own business as opposed to working for others. As farms increase in size and equity and capital requirements increase, more skilled workers may choose to remain in the employee, as opposed to operator, role. In the past, a phenomenon known as the agricultural ladder was not uncommon. It described a succession of activities of a young man in accumulating the skills and equity required to run his own farm business. It typically

involved some casual or part-time work as a young boy in school, a full-time job on a neighbour's or father's farm, the renting of a farm on his own, followed by the purchase of his own farm. The agricultural ladder still exists for many young farm people but the step involving employment with another farmer is often missing and the renting or purchase of additional land is often done in close association with the father's operation. Thus, this source of skilled farm workers is not as common as it once was.

### 3.4.3 Family Workers

Unpaid family workers have played a major role in agricultural production, outnumbering hired workers up until 1975 when slightly more hired workers were hired. The substantial reduction in the number of unpaid family workers between 1951 and 1975 (from 243 thousand to 100 thousand) was associated with an extension of the formal education of farm youth, the growth of non-farm employment opportunities for females, a decrease in the average size of farm families, and changed employment preferences of rural young people.

Most unpaid family workers were traditionally either the farmer's wife or a son serving an apprentice period with his father. Many of today's farmers learned their trade in this manner. Not only did the apprentice period provide them with the basic knowledge necessary to take up their father's vocation but their period of work without cash payment was frequently rewarded with a favourable transfer of the family farm business. However, this practise has been diminishing with today's farm youth either leaving the farm or preferring a more formal arrangement to phase into their father's business. The need for technical agricultural training has often meant that farmers' sons who wish to farm are available for work at home only during the summer season. This often fits in well with seasonal demands and provides the son with funds necessary for his advanced schooling. While statistical information on this aspect of farming is not readily available, it is generally believed that a large proportion of farmers will come from farm families. Thus, a significant number of unpaid family workers may still represent young people in training for a possible career in agriculture.

An increasingly large proportion of unpaid family labour is female. This, presumably, is composed primarily of farm wives who help out during busy seasons and/or take over some of the administrative functions of the farm business. Many farm wives look after bookkeeping and related chores thereby freeing their husbands for more physically demanding tasks. While some farm wives are undoubtedly still heavily involved in the drudgery of traditional farmwork, the wife of the modern commercial farmer will likely find her role as an unpaid family worker hectic but not unpleasant.

## 4. THE CANADIAN FARM INDUSTRY STRUCTURE - HIGHLIGHTS

1975

1. Ninety-two percent of farms in Canada are operated by private individuals and organized as single proprietorships. Six percent are organized as partnerships and two percent as corporations. A large share of the corporations are family farm corporations.

2. Many of the largest and most progressive farms are organized as either partnerships of family farm corporations and indications are that these forms of organization are expanding in numbers as well as in average size.

3. Most farms in Canada are operated by their owners but there is a downward trend in this area. Between 1951 and 1971, the proportion of farmers who owned all of the land they operated declined from 77 to 69 percent. However, only 5 percent of operators rent all of their land with the remaining 26 percent using some combination of ownership and rental.

4. Measured in terms of improved land area, sales and capital investment, the average size of farms in Canada has been increasing steadily for several decades. Average improved hectares per farm increased from 80 to 118 between 1951 and 1971. In 1951 only, 4 percent of all farmers reported sales of over $10,000, whereas in 1971, 31 percent reported sales of more than $10,000.

5. An increasing proportion of farms are operated on a part-time basis and a decreasing proportion of farmers cite farming as their principal source of income. While only 18 percent of census farmers reported something other than farming as their principal occupation in 1951, this had risen to 31 percent in 1971.

6. Farmers traditionally have maintained a high equity in their businesses (81.8 percent on average in 1972); borrowings per farm and the proportion of farmers using credit have increased steadily in the last two decades.

7. In 1973, net farm income was only 17 percent greater than the aggregate of the net income of farmers from all other sources. Commodities such as dairy products, hogs and poultry tend to be produced by farmers who rely heavily on farm income. Producers of grain and cattle tend to rely more heavily on off-farm income sources.

## 4. THE CANADIAN FARM INDUSTRY STRUCTURE - HIGHLIGHTS

1975 (concluded)

8. The average net income of farm taxfilers reached $10,018 in 1974. In that year, only 10.6 percent of farm taxfilers showed total net incomes of more than $25,000 while 36.1 percent showed total net incomes of less than $5,000.

9. There has been a tendancy to increased specialization of farm firms in the last two decades. This is particularly evident among such commodities as poultry meat and eggs, potatoes and hogs. While these commodities were traditionally produced as secondary enterprises on farms which often focused on cattle and dairy products, they are now usually produced on specialty operations.

## 4. THE CANADIAN FARM INDUSTRY STRUCTURE

This section, dealing with farm industry structure, is particularly concerned with the characteristics of the individual units of production, the farm firms, and with how the use of inputs, the production of outputs, and the agricultural income are distributed among those farm firms. In particular, changes in the pattern of distribution of Canadian farm businesses, by numbers and sizes, in the period since 1950, are considered.

Several criteria may be used to measure and illustrate farm size. Historically, the size of the land input has been the commonest. However, the value of total farm capital and of total farm sales are others which can be used and for which there are comprehensive data. Each has its advantages and disadvantages as a measure of size. Because of the way in which inflation confuses inter-temporal comparisons using monetary measures, the illustration of time trends given here is mainly in terms of numbers of farms by land area, class and labour size class. Values of total farm sales and total farm capital are presented as further indicators of the distribution of farms by size of unit in 1971.

In sections 4.1 and 4.2 heavy reliance has been placed on the Agricultural Census Reports, as a source of data. In section 4.3 is presented information on the composition, variability, level, trend and sources of farmers' incomes, on the relationship of farm to off-farm incomes, and the distribution of income by type of farm and income class. The basic series covers the period 1951 to 1975, but the more detailed classifications are available only for some years in the seventies.

The information has been obtained from three different sources of data: (1) the conventional, aggregate farm income series prepared annually by Statistics Canada; (2) the 1958 Farm Expenditure Survey; and (3) farm taxfiler records. These sources cannot be considered comparable in all respects and some care is therefore required in the interpretation of the statistics.

For data from Statistics Canada and from the Farm Expenditure Survey, net farm income is the difference between cash receipts and operating expenses including depreciation, adjusted to take account of changes in farm inventories; it also includes income-in-kind in the form of house rent and food and other produce produced and consumed on the farm. Interfarm sales are excluded. Total net farm income represents the income to farm operators and their unpaid family help for the management and labour provided in operating the farm and the return on their equity in the farm capital.

In the case of data from taxfiler records, net farm income is derived somewhat differently. Income-in-kind and house

rent are not included as income items; inventory change is not considered; and capital cost allowances are used instead of depreciation.

Section 4.4 concentrates mainly on illuminating the extent of relationship between structural change in the farming industry and levels of population and employment in rural communities. Again, heavy dependence is placed on the quinquennial censuses, of population and agriculture, as sources of information.

## 4.1 CHARACTERISTICS OF FARMING OPERATIONS

### 4.1.1 Numbers and Geographical Distribution of Farms

Between the census years of 1951 and 1971, there was 41 percent decline in the number of census farms and a 54 percent decline in the number of people reporting farmer or farm manager as their principal occupation (Table 4.1). A decline in census farm numbers occurred in all provinces, but was greatest in the Atlantic Provinces (73 percent) and least in the Prairie Provinces and British Columbia (30 percent) (Table 4.2).

The proportion of all Canadian census farms located in the Prairie Provinces and British Columbia rose from 44.1 percent in 1951 to 52.7 percent in 1971. The corresponding decline in Quebec and the Atlantic provinces was from 31.8 to 21.4 percent.

Table 4.1 NUMBERS OF CENSUS FARMS, AND OF PERSONS REPORTING 'FARMER' OR 'FARM MANAGER' AS PRINCIPAL OCCUPATION, CANADA, 1951 and 1971

| | 1951 | 1971 | Percent Change 1951 to 1971 |
|---|---|---|---|
| (a) Number of census farms | 623,091 | 366,123 | -41% |
| (b) Number of persons reporting 'farmer' or 'farm manager' as principal occupation | 548,927 | 253,705 | -54% |
| (c) (b) as a percent of (a) | 88% | 69% | |

Source: Statistics Canada, Census of Agriculture and Census of Population, 1951 and 1971.

Table 4.2 NUMBERS AND PROPORTIONS OF CENSUS FARMS BY PROVINCE AND REGION, 1951 and 1971

| | 1951 | | 1971 | | |
|---|---|---|---|---|---|
| | Number of Census farms | Percent of Canada total | Number of Census farms | Percent of Canada total | Percent change in numbers of farms 1951 to 1971 |
| | | % | | % | % |
| Newfoundland | 3,626 | 0.6 | 1,042 | 0.3 | -71 |
| Prince Edward Is. | 10,137 | 1.6 | 4,543 | 1.3 | -55 |
| Nova Scotia | 23,515 | 3.8 | 6,008 | 1.6 | -74 |
| New Brunswick | 26,431 | 4.2 | 5,485 | 1.5 | -79 |
| Atlantic Provinces | 63,709 | 10.2 | 17,078 | 4.7 | -73 |
| Quebec | 134,336 | 21.6 | 61,257 | 16.7 | -54 |
| Ontario | 149,920 | 24.1 | 94,722 | 25.9 | -37 |
| Manitoba | 52,383 | 8.4 | 34,981 | 9.6 | -33 |
| Saskatchewan | 112,018 | 18.0 | 76,970 | 21.0 | -31 |
| Alberta | 84,315 | 13.5 | 62,702 | 17.1 | -26 |
| Prairie Provinces | 248,716 | 39.9 | 174,653 | 47.7 | -30 |
| British Columbia | 24,406 | 4.2 | 18,400 | 5.0 | -30 |
| CANADA | 623,091 | 100.0 | 366,128 | 100.0 | -41 |

Source: Statistics Canada, Census of Agriculture, 1951 and 1971.

### 4.1.2 Utilization of Inputs

#### Land

Between 1951 and 1971, the average area of improved land per farm increased in all provinces, and the average total area per farm increased in all provinces except Nova Scotia, New Brunswick and Ontario. The change in average area was much more significant in the Prairie Provinces and British Columbia (Table 4.3).

#### Labour

In terms of the labour input, the evidence is far less conclusive. If anything, it suggests a decline in the average level of labour input per farm. Sufficient data were not published from the 1951 census to form the basis of a comparison, but changes from 1961 to 1971 have been summarized in Table 4.4. The figures therein should be regarded as only approximate, in that they neglect unpaid family labour and

assume that operators working more than 96 days off the farm and operators hiring one or more year-round workers are mutually exclusive groups.

The proportion of '½ man' or 'part-time' farms in the 1961-71 period showed a decline in the Atlantic Provinces (except P.E.I.) and a significant increase in Ontario and the west. On the other hand, '3-plus-man' farms showed a more significant proportionate increase in the Atlantic Provinces than in the west. The pattern in Quebec over the ten-year period appeared to be relatively stable. The proportionate importance of '2-man' farms declined slightly in Ontario and the west. At least in terms of numbers of farms and numbers of persons occupied in agriculture, farms larger than '1-man' remain relatively insignificant.

There appears to be an increasing incidence of labor units which are employed in agriculture being jointly employed in other sectors. In other words, the phenomenon of 'part-time' farming is on the increase. This is stated without implying an assumption that all 'off-farm' work implies employment outside agriculture. The proportion of census farm operators reporting more than 96 days of off-farm work in the previous year rose from 15 percent in 1951 to 23 percent in 1971 (Table 4.4).

Further evidence comes from a comparison of the number of census farm operators and the number of people citing their principal occupation as farmer or farm manager. It is assumed that the excess of the former over the latter represents part-time operations as a percentage of the total number of census farms; this excess rose from 18 percent in 1951 to 31 percent in 1971 (Table 4.1). Section 4.3.4 of this report, dealing with the level of dependence of farmers on off-farm income sources, is also relevant to this point.

Table 4.3 AVERAGE SIZE OF CENSUS FARM BY TOTAL FARM AREA AND IMPROVED FARM AREA BY PROVINCES, CANADA, 1951 and 1971

| | Average total hectares per farm | | Average improved hectares per farm | |
|---|---|---|---|---|
| | 1951 | 1971 | 1951 | 1971 |
| Newfoundland | 19 | 24 | 7 | 7 |
| Prince Edward Island | 60 | 68 | 35 | 44 |
| Nova Scotia | 102 | 88 | 21 | 26 |
| New Brunswick | 118 | 98 | 34 | 36 |
| Québec | 70 | 70 | 37 | 42 |
| Ontario | 69 | 68 | 42 | 46 |
| Manitoba | 164 | 217 | 100 | 146 |
| Saskatchewan | 263 | 338 | 165 | 241 |
| Alberta | 243 | 316 | 122 | 182 |
| British Columbia | 94 | 126 | 23 | 38 |
| CANADA | 145 | 185 | 80 | 118 |

Source: Statistics Canada, Census of Agriculture, 1951 and 1971.

## Capital (Physical)

'Physical capital' means here buildings, plant, machinery, equipment and livestock (including poultry). A problem arises because we are forced to use money value as a unit for quantifying these inputs in any collective way. Hence, in looking at changes over time, it is important to allow for the effects of inflation on nominal money values. The usual aggregation of 'value of farm buildings' with 'value of farm land' in published statistics makes this analysis more difficult.

Table 4.5 presents estimates of the change in real terms, during the period 1961-1971, in the average value per farm of selected categories of physical capital. This ten-year period saw a roughly 40 percent increase in the real value of buildings per census farm, with proportionately higher increases in the corresponding figures for machinery and equipment (50 percent) and livestock and poultry (60 percent).

Table 4.4 ESTIMATED PERCENTAGES OF ALL CENSUS FARMS WHICH ARE ½-MAN FARMS, 2-MAN FARMS, AND 3-PLUS-MAN FARMS, BY PROVINCE, CANADA, 1961 AND 1971

| | ½-man farms (reporting more than 96 days of off-farm work) | | | 1-man farms (residual) | | 2-man farms (employing one worker year-round) | | 3-plus-man farms (employing two or more workers year-round) | |
|---|---|---|---|---|---|---|---|---|---|
| | 1951 | 1961 | 1971 | 1961 | 1971 | 1961 | 1971 | 1961 | 1971 |
| Nfld. | 42 | 42 | 27 | 51 | 64 | 4 | 5 | 3 | 5 |
| P.E.I. | 13 | 21 | 23 | 73 | 71 | 5 | 4 | 1 | 2 |
| N.S. | 31 | 36 | 32 | 57 | 58 | 6 | 6 | 2 | 4 |
| N.B. | 33 | 33 | 29 | 61 | 64 | 5 | 5 | 1 | 2 |
| Que. | 20 | 22 | 20 | 72 | 74 | 5 | 5 | 1 | 1 |
| Ont. | 15 | 24 | 30 | 66 | 63 | 8 | 5 | 2 | 2 |
| Man. | 8 | 14 | 19 | 81 | 78 | 4 | 3 | 1 | 1 |
| Sask. | 5 | 11 | 14 | 85 | 83 | 3 | 2 | - | 1 |
| Alta. | 8 | 15 | 21 | 78 | 74 | 5 | 3 | 1 | 1 |
| B.C. | 29 | 38 | 40 | 54 | 53 | 6 | 5 | 3 | 3 |
| CANADA | 15 | 20 | 23 | 73 | 72 | 5 | 4 | 1 | 1 |

Source: Statistics Canada, Census of Agriculture, 1951, 1961 and 1971.

Table 4.6 presents some information on the distribution of farms in 1971 by capital size class. It should be noted that in this table the value of land is included with the value of physical capital.

Table 4.5 ESTIMATED AVERAGE INVESTMENT IN BUILDINGS, MACHINERY AND EQUIPMENT, LIVESTOCK AND POULTRY PER CENSUS FARM, CANADA, 1961 and 1971, (1971 dollars)

| | 1961 | 1971 | Percent change 1961-71 |
|---|---|---|---|
| Av. value of buildings per census farm | 12,747 | 17,705 | +39% |
| Av. value of machinery and equipment per census farm | 7,125 | 10,680 | +50% |
| Av. value of livestock and poultry per census farm | 5,491 | 8,801 | +60% |

Sources: (1) Statistics Canada, Census of Agriculture, 1961 and 1971.
(2) Statistics Canada, Post-censal Agricultural Sample Survey, 1971.
(3) Statistics Canada, Consumer Price Index, 1961 and 1971.

Table 4.6 RANGE OF VALUE OF TOTAL FARM CAPITAL INCLUDING LAND, CANADA AND PROVINCES, 1971

| | Value of total farm capital range | | | | All Farms |
|---|---|---|---|---|---|
| | $0-19,949 | $19,950-74,949 | $74,950-149,949 | $149,950+ | |
| Newfoundland | 62.8 | 28.7 | 5.6 | 3.0 | 100.0 |
| Prince Edward Is. | 38.3 | 53.4 | 6.7 | 1.7 | 100.0 |
| Nova Scotia | 50.0 | 40.3 | 7.4 | 2.3 | 100.0 |
| New Brunswick | 51.1 | 42.0 | 5.5 | 1.4 | 100.0 |
| Quebec | 31.2 | 62.2 | 5.7 | 1.0 | 100.0 |
| Ontario | 11.4 | 58.4 | 21.4 | 8.9 | 100.0 |
| Manitoba | 19.1 | 56.1 | 20.5 | 4.4 | 100.0 |
| Saskatchewan | 12.7 | 51.8 | 27.9 | 7.6 | 100.0 |
| Alberta | 13.6 | 49.0 | 25.3 | 12.0 | 100.0 |
| British Columbia | 9.7 | 55.1 | 21.7 | 13.4 | 100.0 |
| CANADA | 17.8 | 54.9 | 20.0 | 7.3 | 100.0 |

Source: Statistics Canada, Census of Agriculture, 1971.

### 4.1.3 Levels of Output

Table 4.7 shows the distribution of census farms in 1971 by 'total farm sales' class. Increases in the average volume of output per farm over time have been well recognized and are documented elsewhere.

In 1951, 78 percent of total farm sales were contributed by 38 percent (the larger ones) of total census farms. In 1971, 31 percent of the farms contributed 78 percent of total sales (Table 4.8).

This observation might be interpreted as indicating that the 'small farm problem' is worsening. However, this is not necessarily the case. Those figures are consistent with the observation of an increasing proportion of part-time farm units. To the extent that such part-time operations are viable, then a dichotomisation of the industry into large (high-volume) farms and part-time (low-volume) farms may be quite natural, efficient and desirable, and not indicative of associated economic problems.

Table 4.7 PERCENT OF CENSUS FARMS IN EACH OF FOUR SELECTED SIZE CLASSES OF TOTAL FARM SALES, CANADA AND BY PROVINCE, 1971

| | Value of total farm sales range | | | | |
|---|---|---|---|---|---|
| | Less than $2,500 | $2,500 - 4,999 | $5,000 - 9,999 | $10,000 and more | All Farms |
| Newfoundland | 73 | 8 | 5 | 14 | 100 |
| Prince Edward Island | 39 | 19 | 20 | 22 | 100 |
| Nova Scotia | 57 | 12 | 10 | 20 | 100 |
| New Brunswick | 53 | 14 | 12 | 21 | 100 |
| Québec | 33 | 18 | 23 | 25 | 100 |
| Ontario | 31 | 14 | 17 | 38 | 100 |
| Manitoba | 28 | 20 | 26 | 27 | 100 |
| Saskatchewan | 18 | 21 | 31 | 29 | 100 |
| Alberta | 26 | 16 | 23 | 35 | 100 |
| British Columbia | 53 | 12 | 11 | 24 | 100 |
| CANADA | 29 | 17 | 22 | 31 | 100 |

Source: Statistics Canada, Census of Agriculture, 1971.

Table 4.8 DISTRIBUTION OF CENSUS FARMS AND OF TOTAL FARM SALES BY FOUR TOTAL SALES SIZE CLASSES OF FARM, CANADA, 1951 and 1971

| | 1951 | | 1971 | |
|---|---|---|---|---|
| Total farm sales class range | Percent of all census farms | Percent of total farm sales | Percent of all census farms | Percent of total farm sales |
| $0 - 2,499 | 62 | 22 | 29 | 2 |
| $2,500-4,999 | 23 | 29 | 17 | 6 |
| $5,000-9,999 | 11 | 27 | 22 | 14 |
| $10,000 & over | 4 | 22 | 31 | 78 |
| All farms | 100% | 100% | 100% | 100% |

Source: Statistics Canada, Census of Agriculture, 1951 and 1971.

### 4.1.4 Degree of Specialization in Production

There has been a clear tendency for Canadian farms to become more specialized over the past two decades. This tendency has been much more significant in animal production than in any crop production. Table 4.9 illustrates the incidence of reporting of nine major crop and animal types by census farmers in 1951 and 1971. The typical farmer had three of the four major animal types in 1951 and two in 1971.

Different evidence for the same tendency is presented in Table 4.10 which deals with a wider range of crops and animal types, but only considers 'commercial' farms, as defined for the 1961 and 1971 censuses of agriculture respectively. The percentage decline over ten years in the number of commercial farms reporting all of the main animal types exceeded the percentage decline in the total number of commercial farms, - again indicating a tendency towards specialization. Using this indicator, the tendency has been highest with sheep and turkeys, and at a somewhat more moderate level for dairy, hens/chickens, and pigs. The crops picture is complicated, with the tendencies for some farmers to go out of production for some crops (wheat, oats, tame hay) being nullified by their increased reporting of other crops (barley, rye, corn, soybeans, rapeseed).

A shallow analysis of the relationship between farm size and specialization in 1971 is presented in Table 4.11. Because of a lack of a breakdown of the sales class '$10,000 and over', the table should be interpreted as revealing more about the difference between part-time and full-time farming operations than between large and small full-time farms.

Clearly the smallest farming operations, which were probably mostly part-time operations, were involved in less of a variety of both animal and crop production. There is no evidence here that the larger farms tended to be more specialized in a cropping sense. The sales class '$10,000 and over' were, however, slightly more specialized in animal production than the sales class '$5,000 - 9,999'.

The above discussion looks at 'specialization' from the point of view of the farmer, and in terms of the number of different productive activities in which he is simultaneously involved. It may be thought of as the 'structuralist' approach. An alternative approach, less appropriate to this section, would be to consider the total volume of production of a given commodity, and the proportion of that total which is produced on specialized units. The conclusions of that approach are likely to be that, for certain products, such as poultry meat and eggs, potatoes, and hogs, the major

Table 4.9 AVERAGE NUMBERS OF SELECTED MAJOR CROP AND ANIMAL TYPES REPORTED PER CENSUS FARM, CANADA, 1951 and 1971

| | 1951 | 1971 | Change 1951-71 |
|---|---|---|---|
| Number of census farms | 623,091 | 366,128 | - 256,963 |
| Average number of major crops reported per census farms | 2.1 | 2.0 | - 0.1 |
| Average number of major animal types reported per census farm | 2.8 | 1.7 | - 1.1 |
| Average number of all major products reported per census farm | 4.9 | 3.7 | - 1.2 |

a'Major crops' included are wheat, oats, barley, tame hay, and flaxseed/rapeseed.

b'Major animal types' includes are beef cattle, dairy cows, pigs, and hens/chickens.

Source: Statistics Canada, Census of Agriculture, 1951 and 1971.

Table 4.10 NUMBERS OF COMMERCIAL FARMS REPORTING SELECTED CROPS AND ANIMAL TYPES, CANADA, 1961 and 1971

| | 1961[a] | 1971[b] | Percent Change 1961-71 |
|---|---|---|---|
| Number of Commercial Farms | 353,293 | 258,259 | -26.9% |
| Commercial farms reporting: - | | | |
| Cattle | 291,193 | 189,676 | -34.9% |
| Cows and heifers for milk | 242,059 | 115,973 | -52.1% |
| Pigs | 184,024 | 95,752 | -48.0% |
| Hens and chickens | 207,301 | 88,538 | -51.6% |
| Sheep | 25,573 | 8,290 | -67.6% |
| Turkeys | 33,165 | 11,104 | -66.5% |
| Ducks | 18,561 | 13,475 | -27.4% |
| Geese | 18,406 | 9,714 | -47.2% |
| Wheat | 182,746 | 115,630 | -36.7% |
| Oats for grain | 244,519 | 126,887 | -48.1% |
| Barley | 86,520 | 120,032 | +38.7% |
| Mixed grains | 44,220 | 41,793 | - 5.5% |
| Rye | 11,006 | 12,594 | +14.4% |
| Buckwheat | 4,709 | 2,897 | -38.5% |
| Dry field peas | 22,046 | 1,745 | -14.7% |
| Dry field beans | 3,200 | 2,552 | -20.2% |
| Corn for grain | 18,609 | 25,284 | +35.9% |
| Tame hay | 227,136 | 153,850 | -32.3% |
| Sugar beets for sugar | 3,855 | 1,820 | -52.8% |
| Corn for silage or fodder | 39,000 | 34,959 | -10.4% |
| Flaxseed | 31,834 | 22,183 | -30.3% |
| Soybeans | 6,431 | 6,627 | + 3.0% |
| Tobacco | 7,129 | 4,616 | -35.3% |

[a]In 1961, a 'commercial' farm had $1,200 or more of total sales.
[b]In 1971, a 'commercial' farm had $2,500 or more of total sales.

Sources: Statistics Canada, Cat. 96-701 and 96-530.

Table 4.11 AVERAGE NUMBER OF REPORTED CROPS AND ANIMAL TYPES PER CENSUS FARM BY ECONOMIC CLASS OF FARM, CANADA, 1971

| | Economic Sales Class | | | |
|---|---|---|---|---|
| | $0-2,499 | $2,500 -4,999 | $5,000 -9,999 | $10,000 & |
| Total number of farms | 107,689 | 62,954 | 82,113 | 113,192 |
| Average number of crops reported per farma | 1.8 | 2.7 | 3.8 | 3.9 |
| Average number of animal types reported per farmb | 1.6 | 2.0 | 2.2 | 2.1 |

aCrops includes are wheat, oats for grain, barley, mixed grain, rye, corn for grain, tame hay, oats for fodder, corn for silage or fodder, other fodder crops, buckwheat, field peas, field beans, flaxseed, soybeans, sunflowerseed, rapeseed, mustardseed, potatoes for sale, tobacco, sugar beets, other field crops, vegetables, greenhouse, nursery, mushroom house, cut flowers & bulbs, tree fruits, strawberries, raspberries, grapes, other small fruit.

bAnimal types includes are cattle, cows and heifers for milk, pigs, sheep, hens and chickens, turkeys, geese, ducks, mink, rabbits, goats.

Source: Statistics Canada, Cat. 96-701.

production source has changed signficantly from being mixed farms to being relatively quite specialized farms. While these commodities were traditionally produced as secondary enterprises on farms which often focused on cattle and dairy production, they are now mainly produced on specialty operations.

## 4.2 BUSINESS ARRANGEMENTS

### 4.2.1 Business Organization

The 1971 agricultural census indicated that about 92 percent of all farms were operated by private individuals (Table 4.12). Partnerships accounted for about six percent of the total farms. Large corporate farms accounted for less than one percent of all census farms in 1971. Family corporate farms accounted for almost two percent of all farms. A cooperative farm is one type of corporation but there were only 21 of these active in Canada in 1975, 16 being in Saskatchewan. These data were collected for the first time in 1971, hence there is no easy way of describing trends in farm organization over the period from 1951 to 1971.

### 4.2.2 Land Tenure

Most farms in Canada are operated by the owners of the land. The 1971 census revealed that approximately 69 percent of the farm operators in Canada owned all their farms (Table 4.13), compared to 77 percent in 1951. About 26 percent of

Table 4.12 PROPORTION OF FARMS BY TYPE OF ORGANIZATION FOR CENSUS FARMS, CANADA AND PROVINCES, 1971

| | Private Individual | Partnership | Institution or Community pasture | Incorporated Business | |
|---|---|---|---|---|---|
| | | | | Family | Other |
| | | | - percent - | | |
| Newfoundland | 91.5 | 3.7 | 2.4 | 2.1 | 0.3 |
| Prince Edward Island | 91.8 | 5.8 | 0.2 | 1.9 | 0.3 |
| Nova Scotia | 93.0 | 4.7 | 0.3 | 1.7 | 0.3 |
| New Brunswick | 93.4 | 3.8 | 0.3 | 2.2 | 0.4 |
| Quebec | 94.7 | 2.3 | 0.2 | 2.7 | 0.1 |
| Ontario | 90.3 | 7.6 | 0.1 | 1.7 | 0.3 |
| Manitoba | 92.0 | 6.0 | 0.1 | 1.6 | 0.2 |
| Saskatchewan | 92.9 | 5.0 | 0.3 | 1.5 | 0.2 |
| Alberta | 90.3 | 7.1 | 0.2 | 2.0 | 0.3 |
| British Columbia | 89.3 | 7.1 | 0.2 | 2.8 | 0.5 |
| Canada | 91.8 | 5.7 | 0.2 | 1.9 | 0.3 |

Source: Statistics Canada, Census of Agriculture, 1971.

Table 4.13 PROPORTION OF CENSUS FARMS BY TENURE OF FARM OPERATORS, CANADA AND PROVINCES, 1951 and 1971

| | 1951 | | | 1971 | | |
|---|---|---|---|---|---|---|
| | Owner | Tenant | Part owner/ Part tenant | Owner | Tenant | Part owner/ Part tenant |
| | - percent - | | | - percent - | | |
| Newfoundland | 89.6 | 1.6 | 8.8 | 89.6 | 2.9 | 7.5 |
| Prince Edward Island | 91.4 | 0.4 | 7.8 | 76.4 | 1.8 | 21.8 |
| Nova Scotia | 91.7 | 1.3 | 7.0 | 79.9 | 2.3 | 17.8 |
| New Brunswick | 93.0 | 1.2 | 5.8 | 81.5 | 2.3 | 16.2 |
| Quebec | 94.3 | 1.9 | 3.8 | 86.2 | 1.9 | 11.9 |
| Ontario | 81.7 | 5.9 | 12.4 | 73.7 | 5.3 | 21.0 |
| Manitoba | 71.0 | 9.7 | 19.3 | 61.8 | 6.2 | 32.0 |
| Saskatchewan | 54.6 | 14.7 | 30.7 | 53.9 | 7.0 | 39.1 |
| Alberta | 62.7 | 11.5 | 25.8 | 59.3 | 5.7 | 34.0 |
| British Columbia | 84.6 | 5.8 | 9.6 | 78.2 | 4.6 | 17.0 |
| Canada | 77.3 | 7.2 | 15.5 | 68.6 | 5.2 | 26.2 |

Source: Statistics Canada, Census of Agriculture, 1951 and 1971.

the farm operators were part owner and part tenant in 1971, and the remaining five percent of operators were tenant farmers. The percentage of part-owner/part-tenant farm operators in Canada increased from 14.3 percent of the total in 1951 to 26.2 percent in 1971 (this represents a seven percent increase in the actual number of operators in this category). In aggregate, in 1971, farm operators in Canada owned about 72 percent of the land they farmed and rented the remainder.

Patterns of tenure of farm operators differ greatly by region. In the prairies, a larger number of farm operators (26.0 percent in 1951 and 35.8 percent in 1971) were part-owner and part-tenant than in the rest of the country (6.6 percent in 1951 and 17.4 percent in 1971). There is a significant regional difference in the amount of rented land farmed. In Eastern Canada, farm operators rented less than 10 percent of the land they farmed in 1971. In the Prairie Provinces and British Columbia, rented land accounted for at least one-third of the area farmed.

In recent years, some provinces have introduced programs that influence, quite directely, the pattern of land tenure. In Saskatchewan, the Land Bank Commission will buy land from farmers at competitive market prices determined by experienced appraisers and will lease land to successful applicants on a cash rent basis giving them an opportunity to purchase the land after five years. Similarly, the Manitoba government may purchase farm land under its Land Lease Program. The land is leased to eligible farm operators who do not have the necessary security to establish or maintain a viable farm unit under other arrangements.

### 4.2.3 Capital Structure

The average capital value (in nominal dollars) per farm in Canada increased from $15,200 in 1951 to $135,411 in 1975, an increase in nominal terms of 790 percent (Table 4.14).

The proportion of census farm operators reporting a mortgage or agreement for sale in 1971 showed a significant increase over the corresponding figure for 1951 in all provinces (Table 4.15). A considerable variation in the extent of use of farm credit between provinces is also apparent in both years.

Recent estimates, drawing on a number of data sources, have established the average level of three types of debt per Canadian farm as well as making some adjustment to the estimates of total per farm assets. These figures are presented in Table 4.16.

Table 4.14 AVERAGE CAPITAL VALUE PER FARM, CANADA, SELECTED YEARS, 1951 to 1975

| Year | Total | Land and Buildings | Implements and Machinery | Livestock and Poultry |
|---|---|---|---|---|
| | | - dollars - | | |
| 1951 | 15,200 | 8,871 | 3,103 | 3,226 |
| 1961 | 27,389 | 17,930 | 5,341 | 4,117 |
| 1966 | 44,307 | 30,600 | 8,251 | 5,456 |
| 1971 | 65,430 | 46,326 | 10,696 | 8,408 |
| 1972 | 71,462 | 49,349 | 11,559 | 10,554 |
| 1973 | 86,829 | 59,755 | 12,687 | 14,387 |
| 1974 | 110,397 | 79,406 | 15,816 | 15,175 |
| 1975 | 135,411 | 102,282 | 20,319 | 12,810 |

Source: Economic Branch, Agriculture Canada.

There was a gradually increasing proportionate use of borrowed capital (declining equity ratio) from 1961 up until 1972. An apparent reversal of this trend in the 1972-74 period is not supported by a decrease in total outstanding debt, and probably reflects the heavy inflation in land value (and, therefore, equity) which is occurring at this time.

Over the decade of the 1960's, short-term debt remained at about one-third of total debt, but there appears to have been a certain amount of substitution of long-term for intermediate-term borrowing.

Table 4.15 PERCENTAGE OF CENSUS FARM OPERATORS REPORTING A MORTGAGE OR AGREEMENT FOR SALE, CANADA AND PROVINCES, 1951 and 1971

| | 1951 | 1971 |
|---|---|---|
| Newfoundland | n.a. | 7% |
| Prince Edward Island | 33% | 35% |
| Nova Scotia | 10% | 25% |
| New Brunswick | 12% | 23% |
| Quebec | 36% | 53% |
| Ontario | 33% | 41% |
| Manitoba | 25% | 37% |
| Saskatchewan | 25% | 40% |
| Alberta | 25% | 43% |
| British Columbia | 28% | 64% |
| CANADA | 28% | 43% |

Source: Statistics Canada, Census of Agriculture, 1951 and 1971.

Table 4.16 BALANCE SHEET SUMMARY FOR THE AVERAGE CANADIAN FARM, SELECTED YEARS, 1961 to 1974

| | 1961 | 1970 | 1972 | 1974 |
|---|---|---|---|---|
| | | - dollars - | | |
| Total Assests per farm | 30,435 | 69,996 | 79,402 | 122,554 |
| Debts Outstanding: | | | | |
| Long-term | 1,169 | 4,910 | 5,441 | 7,528 |
| Intermediate-term | 1,297 | 3,119 | 4,070 | 6,023 |
| Short-term | 1,227 | 3,830 | 4,922 | 7,076 |
| Total Debt per farm | 3,693 | 11,859 | 14,433 | 20,626 |
| | | - percent - | | |
| Ratio of owner equity to total assets (percent) | 87.9% | 83.1% | 81.8% | 83.2% |
| Percent of total debt: | | | | |
| Long-term | 31.6% | 41.4% | 37.7% | 36.5% |
| Intermediate-term | 35.1% | 26.3% | 28.2% | 29.2% |
| Short-term | 33.2% | 32.3% | 34.1% | 34.3% |

Source: Lee, W.F., Long-term Financing for Canadian Agriculture: Problems and Policy Recommendations, Paper prepared for Economics Branch, 1976.

### 4.2.4 Vertical Integration: Product and Input Contracts

At the present time, objective quantitative data about the extent of vertical integration in agricultural production in Canada is fragmentary. However, it appears that the evidence available is sufficient to make certain broad conclusions:

(1) There are examples in Canada both of the producer moving to gain more control of processing/marketing or input supplies, and of the processor or input (usually feed) supplier moving to gain more control of production. In the first case, producers may act individually - for examples, some apple growers in Ontario who undertake their own (and other growers') packing and shipping, and some feedlot operators in Alberta who have expanded into their own slaughter facilities, - or collectively, - for example, the range of producer cooperatives involved in farm supplies or processing. The second type, probably more widely identified with the term 'vertical integration', involves processors of, particularly, meat and vegetables, attempting to achieve more security of supply, and suppliers of, particularly, feeds, attempting to achieve a more secure outlet for their product. Sometimes the distinction between the vertical movement of farmers outward from production and the vertical movement of agribusiness into production is unclear, - as in the case of the mixed farmers with outside interests in vegetable processing companies in Alberta. The remainder of this section will deal only with the control exercised by processors and feed manufacturers on production.

(2) The degree of control exercised by agribusiness on production ranges from outright ownership of the production facilities, through a variety of contracts which may or may not specify price, quantities of product, area seeded, management details (of planting, fertilization, weed/pest control, harvesting, feeding, etc.), terms of repayment on credit advanced, etc., to a more minor and/or more subtle influence such as when farmers depend on the veterinary and nutritional advisory services offered by the feed firms because they are by far the best available.

(3) In recent years, Canada has seen a significant increase in the number of marketing boards which exercise some control over supply by having the power to issue quotas. Typically producer controlled, these boards have usually not been favourably disposed towards allowing quota expansions on farms owned or controlled by agribusiness. Mainly because of this, but also partly because of the direction of public sympathy, it seems to be generally agreed that, with certain notable exceptions (see below), the aggregate level of control exercised by agribusiness firms over farm production, particularly by outright farm ownership, has been declining in recent years.

(4) The notable exceptions to the above observation would appear to be in the areas of vegetable (including potato and sugar beet) processing in the Maritimes, Quebec, Ontario, and Alberta; hog finishing operations in Quebec; and broiler (including hatchery) production in Quebec and elsewhere.

Vegetable processors are faced with a major problem of security of supply, and find it necessary to become involved in a certain proportion of their own production, either on owned or rented land, as well as in supply contracts with farmers. This situation becomes of greater public concern when one firm appears to hold a monopolistic position of dominance, as in the case of McCains in New Brunswick, who are estimated to control 40 percent of New Brunswick potato production through their own operations and contracts. However, past problems, arising from instances of both processors and farmers reneging on contracts and from unfair treatment of individual farmers through the use of monopolistic powers, appear to be declining with the use of much tighter contracts protecting both parties and with increasing incidence of collective bargaining of contracts on the part of producers.

The 1977 Sibbald Group Report prepared for the Economics Branch of Agriculture Canada estimated that 80 percent of Quebec poultry farms are subject to some kind of control from the processors. The same report stated that most hog farms in Quebec are integrated to packers and feed firms through production contracts.

(5) In an attempt to complete the picture, some minor remaining instances of input purchase and output sales

contracts being entered into by Canadian producers can be noted. Many egg producers throughout the country may be involved in purchase contracts with feed manufacturers as part of financing arrangements. The impact of these on the level of output has not been researched, but could conceivably result in over-quota production even when price received is greatly reduced. In the beef industry, a few feedlots are owned by the large meat-packing firms. The Canadian Wheat Board is becoming increasingly involved in contracting directly with farmers, especially in the area of utility wheats. In the dairy industry, and in some provinces (e.g., Alberta), some milk processing firms, both fluid and manufacturing, enter into marketing contracts with milk producers. In turkey production, the level of vertical integration has been high, and largely precipitated by unfavourable economic conditions in the past, but is expected to decline.

## 4.3 FARMERS' INCOMES

### 4.3.1 Distribution of Farmers' Incomes

This section refers to the distribution of incomes of farm taxfilers in 1974, the latest year for which information is available. Unfortunately, no data are available to permit a trend analysis covering the period 1950 to 1975. It should be borne in mind that 1974 was a record year for farm incomes and thus not an altogether typical one.
On a regional basis, average income per taxfiler ranged from a low of $6,466 in Prince Edward Island to a high of $11,607 in Saskatchewan. On average, incomes were lowest in Quebec and the Atlantic Provinces and highest in Saskatchewan, Alberta and British Columbia. Manitoba and Ontario occupy a middle position.

Information on the distribution of incomes is presented in Table 4.17. For Canada as a whole, 142,714 farm taxfilers (36 percent of the total) reported total net incomes of less than $5,000. These people may be considered to be living under low-income conditions. At the other extreme, less than 20 percent of the taxfilers reported incomes of $15,000 or more; nearly all of these relatively high income farm taxfilers were in Ontario and the Prairie Provinces.

The highest incidence of low-income farmers in Canada is in the Atlantic Provinces where 51 percent of farm taxfilers reported total incomes of less than $5,000 in 1974. The figure was near 60 percent in Newfoundland and Prince Edward Island. By contrast, the incidence of low-income farmers was only about 30 percent in Saskatchewan and British Columbia. However, this gives a misleading picture of the magnitude of the low-income farming problem in Canada since it takes no account of the number of people involved. The highest incidence may be in Eastern Canada, but it affects only 6,000 taxfilers (and their families). By contrast Saskatchewan, with the lowest incidence of low incomes, had 28,000 farm taxfilers with total incomes of less than $5,000 in 1974.

Table 4.17 FARM TAXFILERS REPORTING AND TOTAL NET INCOME BY INCOME CLASS, CANADA AND PROVINCES, 1974

| Province | Total Net Income Class (dollars) 0 | 1 to 2,499 | 2,500 to 4,999 | 5,000 to 7,499 | 7,500 to 9,999 | 10,000 to 14,999 | 15,000 to 24,999 | 25,000 to 34,999 | 35,000 to 49,999 | 50,000 and over | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | - number of taxfilers reporting - | | | | | | | | | | |
| Newfoundland | 16 | 114 | 162 | 71 | 38 | 54 | 10a | 12b | 9c | - | 436 |
| Prince Edward Island | 148 | 735 | 979 | 526 | 270 | 247 | 162 | 59 | 33 | 34 | 3,193 |
| Nova Scotia | 163 | 340 | 1,262 | 846 | 603 | 510 | 275 | 62 | 39 | 24 | 4,624 |
| New Brunswick | 151 | 587 | 888 | 665 | 401 | 355 | 236 | 60 | 49 | 37 | 3,439 |
| Quebec | 726 | 4,204 | 11,577 | 12,616 | 4,620 | 3,731 | 1,652 | 421 | 230 | 311 | 40,138 |
| Ontario | 4,159 | 12,898 | 21,482 | 16,204 | 13,119 | 17,908 | 12,158 | 3,412 | 1,640 | 1,432 | 104,412 |
| Manitoba | 1,493 | 6,053 | 8,994 | 6,840 | 4,895 | 6,177 | 4,266 | 1,224 | 578 | 344 | 40,374 |
| Saskatchewan | 2,312 | 9,258 | 16,599 | 14,350 | 11,447 | 16,342 | 14,914 | 5,184 | 2,597 | 1,387 | 94,390 |
| Alberta | 3,939 | 10,337 | 15,808 | 12,028 | 9,464 | 13,184 | 10,906 | 3,407 | 1,795 | 1,365 | 82,233 |
| British Columbia | 1,093 | 2,156 | 3,352 | 2,829 | 2,633 | 4,299 | 2,362 | 833 | 487 | 362 | 21,086 |
| Canada[d] | 14,294 | 47,258 | 81,162 | 64,020 | 47,539 | 62,868 | 47,626 | 14,698 | 7,511 | 5,303 | 395,279 |
| | - average net income per taxfiler (dollars) - | | | | | | | | | | |
| Newfoundland | -3,737 | 1,494 | 3,721 | 6,066 | 8,454 | 11,835 | 17,062a | 29,109b | 59,507c | - | 6,502 |
| Prince Edward Island | -8,045 | 1,497 | 3,707 | 6,133 | 8,615 | 12,186 | 19,492 | 29,444 | 40,251 | 68,283 | 6,466 |
| Nova Scotia | -3,281 | 1,503 | 3,784 | 6,143 | 8,664 | 11,989 | 18,844 | 28,934 | 40,967 | 70,179 | 6,985 |
| New Brunswick | -3,636 | 1,464 | 3,764 | 6,113 | 8,646 | 12,097 | 18,820 | 29,068 | 40,775 | 73,755 | 7,697 |
| Quebec | -3,521 | 1,611 | 3,889 | 5,896 | 8,627 | 11,962 | 18,540 | 29,099 | 41,400 | 85,106 | 7,231 |
| Ontario | -4,403 | 1,480 | 3,781 | 6,180 | 8,704 | 12,223 | 18,760 | 29,210 | 41,151 | 87,743 | 9,923 |
| Manitoba | -3,533 | 1,467 | 3,766 | 6,174 | 8,668 | 12,196 | 18,882 | 29,919 | 40,773 | 70,567 | 8,838 |
| Saskatchewan | -5,046 | 1,521 | 3,783 | 6,210 | 8,704 | 12,293 | 19,087 | 29,160 | 40,917 | 71,121 | 11,687 |
| Alberta | -5,512 | 1,456 | 3,779 | 6,178 | 8,706 | 12,262 | 18,928 | 29,249 | 41,102 | 77,058 | 10,416 |
| British Columbia | -5,682 | 1,420 | 3,777 | 6,207 | 8,733 | 12,283 | 18,683 | 29,241 | 41,181 | 88,938 | 11,169 |
| Canada[d] | -4,826 | 1,491 | 3,793 | 6,131 | 8,693 | 12,233 | 18,904 | 29,176 | 41,034 | 79,179 | 10,018 |

[a] 15,000 to 19,999.
[b] 20,000 to 34,999.
[c] 35,000 and over.
[d] Includes Yukon, Northwest Territories and foreigners and taxfilers who could not be classified.

Sources: (1) Statistics Canada.
(2) Farm Taxfilers Record.

Ontario had over 38,000, Alberta 30,000 and Quebec and Manitoba 16,500 apiece. One may conclude that the problem of low incomes in Canadian agriculture is not confined to particular provinces or regions, but is a problem common to all parts of the country.

### 4.3.2 Sources of Incomes from Farming Activities

After a period of relative stability through the 1950's and 1960's, aggregate net farm income increased dramatically in the 1970's from an average of $1,668 million in 1966-1970 to $2,968 million in 1971-75. Between 1972 and 1975, total net income more than doubled as cash receipts increased by $4,456 million compared with an increase in operating expenses of $2,378 million. However, this rate of increase will not be maintained, as aggregate net farm income declined in 1976 and is forecast to decline again in 1977. Nor has the increase in aggregate income been shared equally by the various subsectors of the industry. As shown in Table 4.18, much of the benefit of increased farm income has accrued to grain farmers; livestock producers have not been so fortunate, in general terms at least.

In 1975, the major gross revenue items as percentages of total cash receipts were (Table 4.19):

| Crops: | | Livestock: | |
|---|---|---|---|
| Wheat | - 25.6% | Cattle | - 18.4% |
| Barley | - 6.3% | Dairy | - 13.6% |
| Oilseeds | - 3.9% | Hogs | - 8.9% |
| Fruits & Vegetables | - 3.1% | | |

On the expenditure side, the major items are depreciation (16.2 percent), machinery expenses (17.8 percent), feed (16.9 percent), interest (8.8 percent), and wages (7.6 percent).

### 4.3.3 Stability of Income from Farming Activities

An important feature of the farm income situation in Canada is the extreme variation that may occur in aggregate net farm income from one year to the next, partly as a consequence of fluctuations in crop output and hence in cash receipts from sales of crops, but also reflecting changes in commodity prices in international markets. For example, the annual changes in net farm income in the last ten years have varied from minus 22 percent in 1966 to plus 74 percent in 1972 (Table 4.20).

It is important to note the difference between measures of the variation of average or total net farm income (as above,

Table 4.18 AGGREGATE NET FARM INCOME BY TYPE[a] OF FARM, CANADA, 1971 to 1975

| | Dairy | Cattle | Hogs | Poultry | Livestock Combination | Grain | Other Crops | Fruits and Vegetables | Crop Combination | Misc.[b] Specialty | Mixed[c] | Total[d] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | - $000,000 - | | | | | | |
| 1971 | 244.4 | 126.2 | 28.3 | 160.0 | 52.7 | 215.5 | -16.4 | 70.5 | 38.6 | -9.4 | 21.3 | 931.7 |
| 1972 | 309.4 | 220.7 | 105.3 | 190.6 | 101.5 | 357.2 | 32.3 | 93.6 | 78.6 | 20.5 | 53.4 | 1,563.1 |
| 1973 | 272.3 | 267.2 | 174.6 | 300.2 | 160.1 | 398.7 | 114.8 | 127.4 | 123.1 | 50.8 | 69.7 | 2,052.9 |
| 1974 | 406.4 | 317.3 | 92.0 | 315.6 | 158.1 | 1,039.1 | 216.2 | 130.8 | 236.9 | 16.7 | 108.1 | 3,037.2 |
| 1975 | 644.9 | 293.3 | 127.1 | 223.5 | 143.0 | 1,305.0 | 62.2 | 134.0 | 210.7 | -8.5 | 118.6 | 3,253.6 |

[a] Based on sales of major (51 percent) commodity.

[b] Based on 51 percent from sum of breeding fees, fur animals and pelts, bees, honey and maple products, wood, sand and gravel, custom work and machine rental, subsidies, insurance proceeds, other farm income.

[c] Farms which are classified into the first ten types are classed as mixed.

[d] As in Table 4.20, Column 5.

Sources: Statistics Canada and Special Tabulation by Economics Branch from farm taxfiler records.

Table 4.19 AGRICULTURAL RECEIPTS AND EXPENSES BY INDIVIDUAL ITEMS, CANADA, 1975

| Cash Receipts | | Expenses | |
|---|---|---|---|
| | - millions of dollars - | | |
| Wheat and C.W.B. payments | 2,538.0 | Taxes | 206.2 |
| Oats and C.W.B. payments | 88.5 | Rent | 207.2 |
| Barley and C.W.B. payments | 620.8 | Wages | 506.1 |
| Advances and deferments | 83.5 | Interest | 584.8 |
| Rye | 26.7 | Fuel and Oil | 463.7 |
| Flaxseed | 80.2 | Machinery repairs | 550.6 |
| Rapeseed | 259.5 | Other machinery expenses | 166.7 |
| Soybeans | 44.9 | Fertilizer | 490.0 |
| Corn | 153.0 | Lime | 7.0 |
| Sugar beets | 39.9 | Pesticides | 133.2 |
| Potatoes | 164.8 | Seeds and plants | 205.8 |
| Fruit | 126.8 | Containers | 14.4 |
| Vegetables | 183.5 | Twine and wire | 84.5 |
| Tobacco | 198.2 | Nursery stock | 13.9 |
| Other Crops | 247.3 | Irrigation | 5.1 |
| Total Crops | 4,688.6 | Feed | 1,126.2 |
| | | Feeder cattle and calves | 73.6 |
| Cattle and calves | 1,818.0 | Artificial Insemination | 11.2 |
| Hogs | 886.5 | Breed associations | 3.4 |
| Sheep and lambs | 13.5 | Veterinary | 57.8 |
| Dairy products | 1,348.4 | Building repairs | 275.2 |
| Poultry | 412.5 | Telephone and electricity | 59.5 |
| Eggs | 258.3 | Custom Work | 104.6 |
| Other livestock and products | 76.7 | Fencing | 74.7 |
| Total livestock and products | 4,813.9 | Miscellaneous | 153.8 |
| | | Depreciation - building | 329.5 |
| Other cash receipts | 374.5 | Depreciation - machinery | 745.0 |
| Total cash receipts from farming operations | 9,877.0 | Total | 6,652.9 |
| | | Net cash income after depreciation charges | 3,254.4 |
| Supplementary payments | 30.3 | | |
| Total Cash Receipts | 9,907.3 | | |

Source: Agriculture Division, Statistics Canada.

Table 4.20 COMPONENTS OF TOTAL NET FARM INCOME, CANADA, 1951 to 1975

| | Total Cash Receiptsa | Total Operating Expenses | Total Cash Income | Total Depreci-ation | Cash Income After Depreci-ation | Income in Kind: Food and Other | Income in Kind: House Rent | Inven-tory Changes | Total Net Farm Income |
|---|---|---|---|---|---|---|---|---|---|
| | | | | - million dollars - | | | | | |
| 1951 | 2,736 | 1,219 | 1,517 | 247 | 1,270 | 220 | 114 | 327 | 1,931 |
| 52 | 2,804 | 1,277 | 1,527 | 265 | 1,262 | 216 | 120 | 282 | 1,880 |
| 53 | 2,710 | 1,261 | 1,449 | 293 | 1,156 | 194 | 136 | 74 | 1,560 |
| 54 | 2,295 | 1,251 | 1,044 | 307 | 737 | 181 | 139 | - 77 | 980 |
| 55 | 2,272 | 1,313 | 959 | 309 | 650 | 172 | 149 | 203 | 1,174 |
| 1956 | 2,534 | 1,426 | 1,108 | 313 | 795 | 164 | 162 | 195 | 1,316 |
| 57 | 2,518 | 1,407 | 1,111 | 329 | 782 | 160 | 170 | -110 | 994 |
| 58 | 2,814 | 1,504 | 1,310 | 346 | 964 | 161 | 185 | - 47 | 1,263 |
| 59 | 2,776 | 1,601 | 1,175 | 360 | 815 | 151 | 196 | - 64 | 1,098 |
| 60 | 2,812 | 1,663 | 1,149 | 373 | 776 | 147 | 205 | 68 | 1,196 |
| 1961 | 2,924 | 1,698 | 1,226 | 380 | 846 | 140 | 214 | -274 | 926 |
| 62 | 3,182 | 1,814 | 1,368 | 394 | 974 | 134 | 222 | 194 | 1,524 |
| 63 | 3,215 | 1,950 | 1,265 | 417 | 848 | 131 | 235 | 302 | 1,516 |
| 64 | 3,504 | 2,068 | 1,436 | 451 | 985 | 127 | 256 | - 86 | 1,282 |
| 65 | 3,831 | 2,234 | 1,597 | 493 | 1,104 | 129 | 283 | 48 | 1,564 |
| 1966 | 4,314 | 2,472 | 1,842 | 542 | 1,300 | 126 | 317 | 173 | 1,916 |
| 67 | 4,402 | 2,628 | 1,774 | 590 | 1,184 | 122 | 364 | -169 | 1,501 |
| 68 | 4,377 | 2,697 | 1,680 | 633 | 1,047 | 121 | 413 | 232 | 1,813 |
| 69 | 4,243 | 2,760 | 1,483 | 648 | 835 | 127 | 453 | 286 | 1,701 |
| 70 | 4,251 | 2,812 | 1,439 | 657 | 782 | 119 | 444 | 63 | 1,408 |
| 1971 | 4,564 | 2,979 | 1,585 | 654 | 931 | 114 | 424 | 146 | 1,615 |
| 72 | 5,451 | 3,205 | 2,246 | 683 | 1,563 | 128 | 431 | -248 | 1,874 |
| 73 | 6,840 | 4,023 | 2,817 | 758 | 2,059 | 167 | 511 | 515 | 3,252 |
| 74 | 8,879 | 4,950 | 3,929 | 892 | 3,037 | 157 | 670 | - 91 | 3,773 |
| 75 | 9,907 | 5,578 | 4,329 | 1,074 | 5,255 | 160 | 762 | 151 | 4,328 |

[a]Includes supplementary payments.

Source: Agriculture Division, Statistics Canada.

for example) and measures of the average variation of individual incomes. As yet, little information is available, but it seems likely that the farming income of most individual farmers shows a greater level of variation than does the net income of the industry as a whole.

### 4.3.4 Dependence of Farmers on Non-Farm Income Sources

In all provinces but two (Manitoba and Saskatchewan), off-farm income exceeded farm income as the major source of income for the average taxfiler with some farm income in 1974.

Total net income per farm taxfiler averaged $10,018 in 1974, made up of $4,452 of farm income and $5,565 of off-farm income (Table 4.21). The major sources of off-farm income were wages and salaries ($3,241) and rental and investment income ($1,122). Off-farm self-employment income, family allowances and miscellaneous sources of income made up the balance.

It is clear that off-farm incomes contribute significantly to the economic welfare of farmers (Table 4.22). In 1958, for Canada as a whole, farm income formed a major source (65 percent) of farmers' income from all sources. By 1971, a year of low farm incomes, farm income had declined to 28 percent of total income. In 1974, with much higher prices for farm products, the ratio of farm to total income was 44 percent. The overall trend from 1958 to 1974 has been, however, a decline in the importance of farm to total income. (Some caution must be exercised in interpreting the trend from 1958 to 1974 because of different data sources for the two years. The figures may not be strictly comparable therefore.) Generally speaking, off-farm income is a less important source of income to farmers in the Prairie Provinces than elsewhere in Canada.

Information on ratios of farm to off-farm income by type of farm, and on sources of off-farm incomes, are shown in Table 4.23, which is based on Statistics Canada and farm taxfiler data. The highest proportions of farm to total income are on poultry, dairy, hog and fruit and vegetable farms where the ratios are 90, 75, 71 and 64 percent respectively. Wages and salaries are highest in miscellaneous specialty, cattle, other crops and grain farms, forming 43, 39, 37 and 31 percent of total incomes. Investment and rental income on these farms is also higher than on other farm types, forming 8-10 percent of total income.

Table 4.21 SOURCES OF TOTAL NET INCOME OF FARM TAXFILERS, CANADA AND PROVINCES, 1974

| Province | Farm | Wages and Salaries | Off-Farm Self-Employment | Rental and Investment | Family Allowances | Others[a] | Total Off-Farm | Total Net Income |
|---|---|---|---|---|---|---|---|---|
| | - average net income per taxfiler (dollars) - | | | | | | | |
| Newfoundland | 1,065 | 3,369 | 565 | 565 | 282 | 656 | 5,437 | 6,502 |
| Prince Edward Is. | 2,859 | 1,995 | 440 | 526 | 238 | 408 | 3,607 | 6,466 |
| Nova Scotia | 941 | 3,789 | 628 | 805 | 242 | 580 | 6,044 | 6,995 |
| New Brunswick | 2,166 | 3,307 | 604 | 810 | 258 | 551 | 5,530 | 7,697 |
| Quebec | 2,419 | 2,739 | 487 | 838 | 283 | 435 | 4,782 | 7,201 |
| Ontario | 2,910 | 4,225 | 704 | 1,377 | 232 | 476 | 7,014 | 9,923 |
| Manitoba | 4,752 | 2,376 | 326 | 801 | 228 | 355 | 4,086 | 8,838 |
| Saskatchewan | 8,062 | 1,669 | 267 | 1,020 | 209 | 380 | 3,545 | 11,607 |
| Alberta | 4,299 | 3,739 | 660 | 1,115 | 217 | 386 | 6,117 | 10,416 |
| British Columbia | 1,286 | 6,151 | 1,069 | 1,752 | 263 | 648 | 9,883 | 11,169 |
| Canada | 4,452 | 3,241 | 544 | 1,122 | 230 | 428 | 5,565 | 10,018 |

[a]Includes alimony, unemployment insurance, pensions, income from roomers and boarders, and miscellaneous income.

Source: Farm taxfiler records.

Table 4.22 PERCENT FARM TO TOTAL NET INCOME FROM ALL SOURCES, CANADA AND PROVINCES, 1958, 1971 and 1974

| Area | 1958 | | 1971 | | 1974 | |
|---|---|---|---|---|---|---|
| | Total Income From all Sources | % Farm | Total Income From all Sources | % Farm | Total Income From all Sources | % Farm |
| | $ per farm | | $ per taxfiler | | $ per taxfiler | |
| Canada | 3,606 | 65.0 | 4,384 | 28.2 | 10,018 | 44.0 |
| Atlantic Provinces | 2,507 | 40.9 | 3,416 | 17.4 | 7,032 | 26.0 |
| Quebec | 3,097 | 58.2 | 4,093 | 38.9 | 7,201 | 33.6 |
| Ontario | 4,229 | 59.9 | 5,278 | 19.0 | 9,923 | 29.3 |
| Manitoba | 3,538 | 75.1 | 3,154 | 28.9 | 8,838 | 53.4 |
| Saskatchewan | 3,270 | 77.1 | 3,811 | 50.9 | 11,607 | 69.5 |
| Alberta | 4,252 | 77.1 | 4,289 | 24.6 | 10,416 | 41.3 |
| British Columbia | 4,165 | 48.4 | 6,275 | 4.2 | 11,169 | 11.5 |

Sources: (1) Statistics Canada, Farm Expenditure Survey, 1958.
(2) Farm taxfiler records.

## 4.4 ROLE OF FARMING IN RURAL COMMUNITIES

### 4.4.1 Rural Population and Employment Relationships

Emphasis in this section is on the question: "To what extent has farm consolidation and a decline in the population on farms been accompanied by a decline in the rural population in general and to what extent has it caused the latter?" 'Rural population' is used here to include as well as people living on farms, people living in the countryside or in villages of up to 1,000 population (hereafter 'rural-non-farm'), and people living in towns of between 1,000 and 10,000 in population (hereafter 'rural towns').

Table 4.23 INCOME SOURCES BY TYPE OF FARM, CANADA, 1973

| Income Source | Dairy | Cattle | Hogs | Poultry | Livestock Combination | Grain | Other Crops | Fruits and Vegetables | Crop Combination | Miscellaneous Specialty | Mixed | Total All Types |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | - million dollars - | | | | | | |
| Wages and Salaries | 43.3 | 275.2 | 47.3 | 24.1 | 83.6 | 257.6 | 107.0 | 48.0 | 42.7 | 98.0 | 24.8 | 1,051.6 |
| Non-Farm Self-Employment | 8.1 | 59.4 | 6.8 | 4.2 | 17.8 | 34.0 | 23.4 | 6.9 | 10.2 | 17.4 | 4.0 | 192.2 |
| Investment and Rental | 19.2 | 58.4 | 6.3 | 3.0 | 17.1 | 75.5 | 24.9 | 8.8 | 13.9 | 22.2 | 7.0 | 256.3 |
| Other Income | 20.2 | 50.4 | 9.4 | 3.5 | 15.7 | 64.4 | 19.7 | 6.9 | 20.1 | 37.8 | 15.9 | 264.0 |
| Total Net Non-Farm Income | 90.8 | 443.4 | 69.8 | 34.8 | 134.2 | 431.5 | 175.0 | 70.6 | 86.9 | 175.4 | 51.7 | 1,764.1 |
| Net Farm Income | 272.2 | 267.2 | 174.6 | 300.2 | 160.1 | 398.9 | 114.8 | 127.4 | 123.1 | 50.8 | 69.7 | 2,059.0 |
| Total Net Income | 363.0 | 710.6 | 244.4 | 335.0 | 294.3 | 830.4 | 289.8 | 198.0 | 210.0 | 226.2 | 121.4 | 3,823.1 |

Sources: (1) Statistics Canada.
(2) Farm taxfiler records.

It is assumed that we are interested in 'rural population change' as an indicator for two reasons: firstly, in its own right as a measure of success with a policy of rural population maintenance; secondly, as a crude proxy for the well-being of rural residents relative to the rest of the country, and based on the assumption that, if the level of personal well-being deteriorates, people will move out of an area and the total population will decline, and vice versa.

An examination of rural population changes between the 1961 and 1971 censuses for 157 census divisions (those containing a significant agricultural sector component and whose boundaries were comparable over this period) revealed a rise in about 45 percent of cases and a fall in the other 55 percent. Farm numbers and farm population declined in all but one of these census divisions, with the rate of decline being generally greater in Eastern Canada (excluding Southern Ontario) than in Southern Ontario and the prairies (data for British Columbia are not comparable over the period). The incidence of a total rural population decline appears to have borne little or no relationship to the rate of decline of farm numbers in the same period (Table 4.24, part D). Similarly, there is no clear-cut relationship between rural population decline and either the importance of agriculture in the rural economy of the census division, or with the existence of a city of over 10,000 people within the same census division, or with both of these two classifying characteristics in combination (Table 4.24, parts A, B and C). A certain amount of consistency in the pattern of rural population decline is, however, shown within some (but not all) geographic regions (Table 4.24, part E).

Some aggregated data are presented for ten selected regions in Canada (Tables 4.25, 4.26 and 4.27). These regions are defined and illustrated in Figures 4.1 and 4.2. Total rural population fell in five of the ten cases. However, in three regions the fall was considerable, in three regions there was an appreciable rise in rural population, while in the other four regions the change was only marginal (Table 4.25).

Table 4.24 COMPARISON BETWEEN ALTERNATIVE METHODS OF CLASSIFYING CENSUS DIVISIONS, AND THEIR CORRELATION WITH RURAL POPULATION a/ DECLINE, 1961-71

| Characteristics of CD (see footnotes) | | Movement of total rural population 1961-71 | | |
|---|---|---|---|---|
| | | Number of CDs showing a rise in rural population | Number of CDs showing a fall in rural population | % |
| A | Metropolitanb | 32 | 29 | (48) |
| | Micropolitanb | 39 | 58 | (59) |
| B | Agriculturalc | 14 | 42 | (75) |
| | Mixedc | 24 | 19 | (44) |
| | Non-Agriculturalc | 33 | 25 | (43) |
| C | Metro./Agric. | 9 | 11 | (55) |
| | Micro./Agric. | 5 | 31 | (86) |
| | Metro./Mixed | 10 | 7 | (41) |
| | Micro./Mixed | 14 | 12 | (46) |
| | Metro./Non-Agric. | 13 | 11 | (46) |
| | Micro./Non-Agric. | 20 | 14 | (41) |
| D | Farmer decline 30% plusd | 27 | 34 | (56) |
| | Farmer decline 20-29.9%d | 29 | 19 | (40) |
| | Farmer decline 0-19.9%d | 15 | 33 | (69) |
| E | Calgary/Edmonton corridor regione | 3 | - | ( 0) |
| | Prairie regione | - | 36 | (100) |
| | Winnipeg fringe regione | 2 | 3 | (60) |
| | S.W. Ontario regionf | 13 | 1 | ( 7) |
| | N.E. Ontario regionf | - | 4 | (100) |
| | E. Townships/Côte-sud regionf | 5 | 7 | (58) |
| | Gaspé/Côte-sud regionf | - | 7 | (100) |
| | Prince Edward Islandf | 3 | - | ( 0) |
| | W. Nova Scotia region | 8 | 2 | ( 0) |

a'Rural Population' includes people living outside towns or in towns which in 1961 had less than 10,000 inhabitants.

b'Metropolitan' CDs contained an urban centre with more than 10,000 people; 'Micropolitan' CDs did not.

cClassification B is based on a measure of the importance of agriculture in the total rural economy. In 'Agricultural' CDs the ratio of farm cash receipts to total rural disposable income (1970-71, two-year average) is greater than 50 percent; in 'Mixed' CDs it is between 25.0 and 49.9 percent; and in 'Non-agricultural' CDs is is between 5.0 and 24.9 percent. CDs where this ratio was less than 5.0 percent were excluded from the analysis.

dClassification D is based on the percentage decline in farm numbers within each CD from 1961-71.

eSee Figure 4.1.

fSee Figure 4.2.

Source: Calculated from data published in the Statistics Canada 1961 and 1971 population censuses.

Table 4.25 RURAL POPULATION 1961 and 1971, AND RURAL POPULATION CHANGE 1961-71, TEN SELECTED REGIONS OF CANADA

| Region[a] | Rural Population[b] 1961 | Rural Population 1971 | Change 1961-1971 | Percent Change 1961-1971 |
|---|---|---|---|---|
| Calgary-Edmonton Corridor | 180,247 | 199,425 | + 19,178 | + 11% |
| S.W. Ontario | 601,809 | 663,200 | + 61,391 | + 10% |
| S.E. Ontario | 342,092 | 375,950 | + 33,858 | + 10% |
| Prince Edward Island | 82,996 | 86,385 | + 3,389 | + 4% |
| W. Nova Scotia | 252,513 | 260,840 | + 8,327 | + 3% |
| E. Townships/Côte-sud | 339,368 | 336,455 | - 2,913 | - 1% |
| Winnipeg fringe | 126,614 | 125,330 | - 1,284 | - 1% |
| Prairies | 1,106,240 | 992,830 | -113,410 | - 10% |
| N.E. Ontario | 153,484 | 134,540 | - 18,944 | - 12% |
| Inner Gaspé/Côte-sud | 242,081 | 210,280 | - 31,801 | - 13% |

[a]For definition of boundaries of each region, see Figures 4.1 and 4.2.

[b]'Rural population', as used here, includes all people not living in towns and cities which , in 1961, had a population of 10,000 or over.

Source: Statistics Canada, Population Census, 1961 and 1971.

Table 4.26 PERCENT CHANGE IN RURAL POPULATION COMPONENTS 1961-71, RURAL POPULATION AS PERCENT OF TOTAL POPULATION, AND PERCENT CHANGE IN URBAN POPULATION 1961-71, TEN SELECTED REGIONS OF CANADA[a]

| Region | Rural Population % Change 1961-71 | | | | Rural population as % total population 1971 | % Change in Urban population 1961-71 |
|---|---|---|---|---|---|---|
| | Farm | Rural non-farm | Towns | Total | | |
| Calgary/Edmonton Corridor | - 15 | + 12 | + 58 | + 11 | 19 | + 58 |
| S.W. Ontario | - 19 | + 27 | + 26 | + 10 | 48 | + 31 |
| S.E. Ontario | - 19 | + 24 | + 14 | + 10 | 64 | + 14 |
| Prince Edward Island | - 39 | + 32 | + 43 | + 4 | 82 | + 4 |
| W. Nova Scotia | - 51 | + 12 | + 17 | + 3 | 95 | + 5 |
| E. Townships/Côte-sud | - 42 | + 28 | + 19 | - 1 | 73 | + 12 |
| Winnipeg fringe | - 24 | + 19 | + 24 | - 1 | 69 | + 13 |
| Prairies | - 22 | - 10 | + 20 | - 10 | 69 | + 20 |
| N.E. Ontario | - 38 | - 11 | - 2 | - 12 | 63 | + 39 |
| Inner Gaspé/Côte-sud | - 53 | + 8 | + 9 | - 13 | 84 | + 39 |

[a]'Rural population', as used here, includes all 'non-urban population'. 'Urban population' includes all residents of towns and cities which, in 1961, had more than 10,000 people. 'Rural towns' are defined as all those with between 1,000 and 9,999 people. 'Rural non-farm population' included people living in the country or in towns and villages of less than 1,000 people, but not resident on a farm.

Source: Calculated from data published by Statistics Canada for the 1961 and 1971 population censuses.

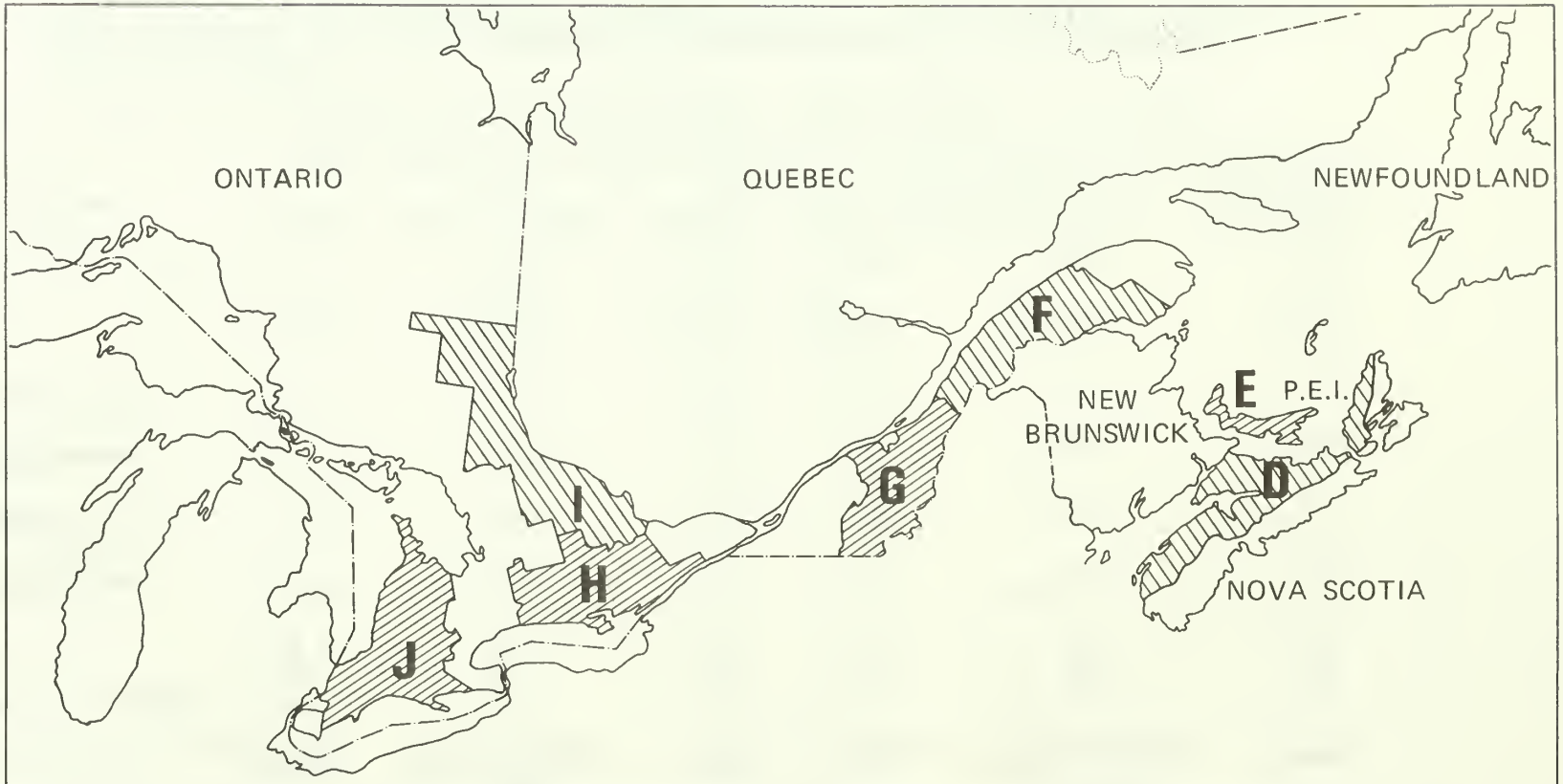
Table 4.27 PERCENT COMPOSITION OF RURAL POPULATION, TEN SELECTED REGIONS OF CANADA[a] 1961 and 1971

| Region | Percent of total rural population 1961 | | | Percent of total rural population 1971 | | |
|---|---|---|---|---|---|---|
| | Farm | Rural non-farm | Towns | Farm | Rural non-farm | Towns |
| Calgary-Edmonton Corridor | 45 | 31 | 26 | 35 | 32 | 34 |
| S.W. Ontario | 36 | 35 | 29 | 27 | 40 | 33 |
| S.E. Ontario | 26 | 45 | 29 | 19 | 51 | 30 |
| Prince Edward Island | 42 | 44 | 15 | 24 | 55 | 20 |
| W. Nova Scotia | 16 | 53 | 31 | 8 | 57 | 35 |
| E. Townships/Côte-sud | 38 | 33 | 30 | 22 | 42 | 36 |
| Winnipeg fringe | 48 | 31 | 21 | 37 | 37 | 26 |
| Prairies | 49 | 32 | 19 | 42 | 33 | 25 |
| N.E. Ontario | 17 | 47 | 37 | 12 | 48 | 41 |
| Inner Gaspé/Côte-sud | 35 | 39 | 26 | 19 | 49 | 33 |

[a]See footnote to Table 4.26 for definitions of 'rural towns', 'rural non-farm' and 'urban'.

Source: Calculated from data published by Statistics Canada for the 1961 and 1971 population censuses.

Figure 4.1 **BOUNDARIES OF SIX SELECTED REGIONS IN EASTERN CANADA, 1976**




Key to Census Divisions Included by Region

D Western Nova Scotia: Annapolis, Antigonish, Colchester, Cumberland, Digby, Hants, Inverness, Kings, Pictou, Victoria.
E Prince Edward Island: Kings, Prince, Queens.
F Inner Gaspe/Côte Sud (Quebec): Bonaventure, Kamouraska, Matane, Matapedia, Rimouski, Rivière-du-loup, Témiscouata.
G Eastern Townships/Côte Sud (Quebec): Beauce, Bellechasse, Dorchester, Frontenac, L'Islet, Lotbiniere, Mégantic, Montmagny, Richmond, Sherbrooke, Stanstead, Wolfe.
H South-Eastern Ontario: Dundas, Durham, Frontenac, Grenville, Hastings, Lanark, Leeds, Lennox & Addington, Northumberland, Peterborough, Prince Edward, Victoria.
I North-Eastern Ontario: Manitoulin, Nipissing, Renfrew, Temiskaming.
J South-Western Ontario: Brant, Bruce, Elgin, Grey, Haldimand, Huron, Kent, Lambton, Middlesex, Norfolk, Oxford, Perth, Waterloo, Wellington.

Figure 4.2 **BOUNDARIES OF THREE SELECTED REGIONS IN WESTERN CANADA, 1976**


Key to Census Divisions Included by Region

A Prairies: Alberta-numbers 1, 2, 3, 4, 5, 7, 10 and 13.
Saskatchewan-all census divisions except 18.
Manitoba-numbers 3, 4, 7, 8, 10, 11, 13, 14, 15, 17 and 18.

B Winnipeg & Fringe: Manitoba-numbers 1, 2, 5, 6 and 9.

C Calgary-Edmonton Corridor: Alberta-numbers 6, 8 and 11.

By far the largest absolute rural population decline, among the regions examined, occurred in the Prairie region. It is noteworthy that in this region the impact is spread very unevenly between the larger rural towns (1,000 to 10,000 people in 1961) and the smaller rural towns and villages (less than 1,000). The former showed a population increase of 20 percent over the decade, while the latter rural population component decreased by 10 percent (Table 4.26). This degree of difference between the changes shown by these two components is not typical of the other regions.

It would appear that, of the regions examined, three were 'problem areas' in the sense of having a significantly declining rural population. These are the regions we have called 'Prairies', 'N.E. Ontario' and 'Inner Gaspé/Côte-sud'. These three regions, together with the agriculturally very important 'S.W. Ontario' region, are the subject of more detailed scrutiny in the remainder of this section. Focus is on the question of to what extent farm consolidation affected rural population and employment in the 1961-71 period.

In what follows, it is assumed that the size of the rural labour force, as measured in the population census, is a sufficiently good indicator of the employment available to rural people. This assumption is a cause for concern on two counts. Firstly, it means that unemployment is neglected. Secondly, the concern is with changes in the employment of people who reside in rural areas, and not with changes in the number of rurally located jobs; since the feasible commuting distance rose for many people over this period, it is expected that an increasing percentage of the employment available to rural people is located in urban areas.

### 4.4.2 The Prairie Region

The number of jobs for rural residents of this region rose by 19,776 (5 percent) during the decade 1961-1971. (Table 4.28) This increase was concurrent with a decline in agricultural employment of 33,924; i.e., increases in employment in some other sectors more than off-set the large decline in employment in 'Agriculture' as well as a smaller decline (5,583) in 'Transportation, Communication and other Utilities'.

A rural population decline of ten percent, in the Prairie region, in the face of a five percent increase in rural employment, is largely explained by an increased work-force participation rate (ratio of labor force to all persons 15 years of age and over). This rate rose from 46 percent in 1961 to 57 percent in 1971 in the Prairie region. The increased work force participation rate in total is explained

Table 4.28 RURAL LABOUR FORCE BY SEX AND MAJOR INDUSTRY DIVISION, PRAIRIE REGION, CANADA, 1961 AND 1971

| INDUSTRY | 1961 | | | 1971 | | | Change 1961-1971 | | |
|---|---|---|---|---|---|---|---|---|---|
| | M | F | TOTAL | M | F | TOTAL | M | F | TOTAL |
| Agriculture | 181,910 | 23,024 | 204,934 | 134,975 | 36,035 | 171,010 | -46,935 | 13,011 | -33,924 |
| Other primary | 5,797 | 128 | 5,925 | 8,500 | 325 | 8,825 | 2,703 | 197 | 2,900 |
| Manufacturing | 7,069 | 1,411 | 8,480 | 11,240 | 2,605 | 13,845 | 4,171 | 1,194 | 5,365 |
| Construction | 15,484 | 263 | 15,747 | 17,050 | 570 | 17,620 | 1,566 | 307 | 1,873 |
| Transportation, communication & utilities | 25,160 | 3,938 | 29,098 | 20,040 | 3,475 | 23,515 | - 5,120 | - 463 | - 5,583 |
| Trade | 28,890 | 8,701 | 37,591 | 29,975 | 12,930 | 42,905 | 1,085 | 4,229 | 5,314 |
| Finance, insurance & real estate | 2,484 | 1,690 | 4,174 | 2,727 | 3,710 | 6,435 | 241 | 2,020 | 2,261 |
| Services | 19,342 | 31,052 | 50,394 | 22,940 | 42,350 | 65,290 | 3,598 | 11,298 | 14,896 |
| Public admin./defence | 12,171 | 1,471 | 13,642 | 14,470 | 4,700 | 19,170 | 2,299 | 3,229 | 5,528 |
| Other/unspecified | 5,414 | 2,147 | 7,561 | 15,910 | 12,955 | 28,865 | 10,496 | 10,808 | 21,304 |
| TOTAL | 303,731 | 73,823 | 377,554 | 277,750 | 119,580 | 397,330 | -25,981 | 45,757 | 19,776 |

Sources: Compiled from Statistics Canada, 1971 Census of Canada, Industries, Cat. 94-741, 94-744 & 94-745; and D.B.S., 1961 Census of Canada, Labour Force, Cat. 94-520, 94-521 & 94-522.

wholly by an increased work force participation by rural women from 22 percent in 1961 to 36 percent in 1971, - the participation of the rural male population actually declined somewhat over the same period (Table 4.29). It is assumed here that the dramatic increase in the number of rural women reporting work partly reflects gradually changing social attitudes with regard to women working. It is believed that certain types of unpaid labour were more frequently reported as 'employment' in 1971 than in 1961. However, there seems little doubt that a considerable rise in paid employment among women also occured in this period.

In 1961, 378,000 jobs supported a population of 1,106,000 in the Prairie region. It might be suggested that, if the work force participation rate, and particularly the desire among women to work, had remained unchanged, 397,000 jobs in 1971 could have supported a regional rural population of 1,162,000. Therefore, since the actual 1971 population was 993,000, the change in the number of jobs required per family caused a population decline over the decade of 169,000 (equal to 1,162,000 minus 993,000), or considerably more than the net loss of farm population of 121,000 which may be directly attributable to the consolidation of farms. This analysis is overly simplistic in that it neglects changes in work reporting behavior (as mentioned above), the problem of the classification of partial employment, multiplier effects on job creation due to added income (and spending) per family with higher work force participation rates, multiplier effects on closely associated businesses of a reduction in aggregate spending by farmers, and changes in the population age structure. However, it does serve to illustrate that farm consolidation is not the only significant force affecting rural population change in the prairie region. It appears that an increasing desire for both spouses to work has had an impact on the rural population of this region of at least the same rough order of magnitude as the impact of farm consolidation. This conclusion must be tentative pending more information on the extent to which reported employment by women is part-time work and on the extent to which the ability of a married woman to obtain work may prevent or delay a rural family having to migrate to an urban area when the husband loses his job.

The impacts of other phenomena which have also been cited in the past as causes of rural population decline in the prairies are even more difficult to isolate. Examples of these other forces are school consolidation, hospital consolidation, railway branch line abandonment, and an increasing mobility of the rural population due to more affluence (cars, etc.), better roads and more time to travel further afield (to a bigger range of choice) for shopping and recreation.

Despite a 17 percent decline of 34,000 jobs between 1961 and 1971, the 'Agriculture' sector remained the region's biggest

Table 4.29 RURAL LABOUR FORCE PARTICIPATION RATE, SELECTED REGIONS, CANADA, 1961 AND 1971.

| REGION | MALES | | FEMALES | | TOTAL | |
|---|---|---|---|---|---|---|
| | 1961 | 1971 | 1961 | 1971 | 1961 | 1971 |
| Prairies | 78.0 | 76.7 | 21.9 | 36.2 | 46.5 | 57.4 |
| S.W. Ontario | 80.8 | 78.9 | 27.0 | 40.3 | 54.4 | 59.8 |
| N.E. Ontario | 85.1 | 71.6 | 24.3 | 33.2 | 56.8 | 52.8 |
| Inner Gaspé/Côte-Sud | 68.0 | 58.6 | 19.6 | 23.4 | 44.8 | 41.2 |

Source: Based on figures from Statistics Canada, 1971 Census of Canada, Population, and D.B.S. 1961 Census of Canada, Population.

employer with 43 percent of the total rural work force in 1971. Also, 6,000 jobs were lost from the 'Transportation, Communications and Other Utilities' sector.

Fortunately, the total adverse effect on rural population of all these negative forces has been largely counteracted, in the Prairie region, by a growth in employment available in all other sectors and particularly in the 'Services' sector (Table 4.28). The net growth in employment in these other sectors was of the order of 59,000 jobs, - approaching twice the number lost from agriculture.

Examination of changes in employment by industry and by sex (Table 4.28) suggests that the increse in employment among women, may be overestimated due to changed reporting habits by as much as 30 to 40 percent, or 15,000 to 20,000 jobs. This in turn would lead to a conclusion that, after this adjustment, overall rural employment in the Prairie region remained roughly static between 1961 and 1971. Major increases in female employment are seen in the 'Agriculture' and 'Other/Unspecified' categories. It is believed that, in large part, these particular increases reflect many instances of 'unpaid farm help' being reported as 'employment' in 1971 but not in 1961. This conclusion also implies that the real decline in agricultural employment over the period is underestimated.

Agricultural employment of males fell by 47,000 jobs or 26 percent. On the other hand, a significant expansion of employment in the 'Services' sector, which employs predominantly women (Table 4.30), has facilitated an increased participation in the work force by women, and has helped to counteract the impact of jobs lost in agriculture due to farm consolidation.

### 4.4.3 The South-Western Ontario Region

The other major agricultural region to be studied here, S.W. Ontario, differs from the Prairie region in that it did not experience a rural population decline between 1961 and 1971, and in that the rural economy was and is not dominated by agriculture to the same extent. In 1971, for instance, the 'Manufacturing sector contributed as much, and the 'Services' sector almost as much to rural employment in the region as did 'Agriculture'. The loss of 15,000 agricultural jobs (perhaps 19,000 to 20,000 after adjustment for changed reporting habits) was well nullified by the gain of 69,000 jobs (perhaps 60,000 after adjustment) in other sectors. All sectors except 'Agriculture' showed a growth in employment of rural people over the decade. This may reflect to a large extent the fact that rural residents in S.W. Ontario in many cases are within

4.30 COMPOSITION OF THE RURAL LABOUR FORCE BY SEX FOR MAJOR INDUSTRY DIVISIONS, PRAIRIE REGION, CANADA, 1961 AND 1971

| INDUSTRY | 1961 | | 1971 | |
|---|---|---|---|---|
| | M | F | M | F |
| | % | % | % | % |
| Agriculture | 89 | 11 | 79 | 21 |
| Other primary | 98 | 2 | 96 | 4 |
| Manufacturing | 83 | 17 | 81 | 19 |
| Construction | 98 | 2 | 97 | 3 |
| Transportation, communication & utilities | 86 | 14 | 85 | 15 |
| Trade | 77 | 23 | 70 | 30 |
| Finance, insurance & real estate | 60 | 40 | 42 | 58 |
| Services | 38 | 62 | 35 | 65 |
| Public administration & defence | 89 | 11 | 75 | 25 |
| Other/unspecified | 72 | 28 | 55 | 45 |
| TOTAL | 80 | 20 | 70 | 30 |

Source: As per Table 4.28.

commuting distance of employment located in cities such as London, Kitchener-Waterloo, and Guelph.

The labor force participation rate in rural S.W. Ontario was significantly higher than in the rural Prairies in 1961 (54 percent as opposed to 46 percent; Table 4.29) but again rose significantly to 60 percent in 1971. Once again, also, the increased overall participation in the work force was completely attributable to an increase in the proportions of women working; the labour force participation rate of males declined slightly over the same period.

In contrast to the other three study regions, which all experienced significant rural population declines, the major difference exhibited by the S.W. Ontario region appears to be in the extent of the contribution to rural employment provided by the 'Manufacturing' sector (Table

4.31). It also showed the highest proportion of women in the total rural work force, and in both the 'Agriculture' and 'Manufacturing' sectors' work forces. Conversely, the rural women of this region are much les dependent on the 'Services' sector for employment than their counterparts in N.E. Ontario and Inner-Gaspé/Côte-sud (particularly), and in the Prairies. In S.W. Ontario, all sectors except 'Agriculture' grew between 1961 and 1971, in terms of the employment of rural people.

Table 4.31 COMPOSITION OF THE TOTAL RURAL LABOUR FORCE BY MAJOR INDUSTRY DIVISION, FOUR SELECTED REGIONS, CANADA, 1961 AND 1971

| INDUSTRY | Inner Gaspé/Côte-Sud | | N.E. Ontario | | S.W. Ontario | | Prairies | |
|---|---|---|---|---|---|---|---|---|
| | 1961 | 1971 | 1961 | 1971 | 1961 | 1971 | 1961 | 1971 |
| | % | % | % | % | % | % | % | % |
| Agriculture | 24 | 12 | 9 | 6 | 34 | 22 | 54 | 43 |
| Other primary | 17 | 10 | 11 | 7 | 1 | 1 | 2 | 2 |
| Manufacturing | 8 | 13 | 14 | 13 | 20 | 22 | 2 | 3 |
| Construction | 6 | 8 | 7 | 7 | 6 | 7 | 4 | 4 |
| Transportation, communication & utilities | 8 | 7 | 10 | 8 | 6 | 5 | 8 | 6 |
| Trade | 11 | 11 | 13 | 12 | 12 | 13 | 10 | 11 |
| Finance, insurance & real estate | 1 | 2 | 2 | 2 | 2 | 5 | 1 | 2 |
| Services | 18 | 23 | 18 | 23 | 13 | 17 | 13 | 16 |
| Public admin./defence | 2 | 4 | 15 | 12 | 5 | 4 | 4 | 5 |
| Other/Unspecified | 5 | 9 | 3 | 10 | 2 | 6 | 1 | 7 |
| TOTAL | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Source: As per table 4.28.

### 4.4.4 The North-Eastern Ontario Region

The loss of employment in 'Agriculture' between 1961 and 1971 in this region (2,400 jobs) represented less than 20 percent of the total loss (12,500 jobs) among those sectors to show a net employment decline. This decline in job opportunities in some sectors was partially offset by increases in employment in a few others, notably the 'Services' sector. However, in this region the net overall effect was an 11 percent decline in rural employment. Changed work reporting habits probably exerted a downward bias on this figure, and probably accounts for much of a 140 percent increase over the decade in employment in the 'Other/Unspecified' sector.

The decline in rural employment in N.E. Ontario, - in reality probably more than 11 percent, - is reflected in a rural population decline of 12 percent over the decade. However, here the work force participation rate did not rise but rather declined from 57 percent to 53 percent (Table 4.29). Rural women increased their rate of participation from 24 percent to 33 percent, but the rate for men decreased from 85 percent (by far the highest figure for all regions in 1961) to 72 percent. It would appear that, after allowing for changed reporting habits, a significant increase in job-holding among women occurred (absolute employment increases in nearly all sectors were reported for women Table 4.32).

The N.E. Ontario region contrasts with both the Prairie and the S.W. Ontario regions in that overall employment decline occurred in nearly all sectors.

### 4.4.5 The Inner Gaspé/Côte-sud Region

This region had the highest rate of attrition and consolidation of farms, and hence the highest rate of decline of farm population (53 percent) between 1961 and 1971 of all the regions studied (Table 4.26). Consequently the 'Agriculture' sector fell from being the most important source of employment for rural people in the region with 24 percent of the jobs in 1961, to providing only 12 percent of the jobs in 1971.

The loss of roughly 8,000 jobs in 'Agriculture', 5,500 jobs in 'Other Primary' (forestry, mining, etc.), and 1,000 jobs in 'Transportation, Communication and Utilities' was not compensated for by the modest growth in other sectors, so that total employment of rural people in the region declined by 5,000 or 8 percent (Table 4.33).

The work force participation rate in this region began by being the lowest of the four regions in 1961, at 45 percent, and fell further to 41 percent in 1971 (Table 4.29). Again, this overall participation rate decline conceals a rise in the participation of rural women in the work force from 20 percent in 1961 to 23 percent in 1971. This latter figure is considerably lower than

Table 4.32 CHANGE IN RURAL EMPLOYMENT BY SEX AND MAJOR INDUSTRY DIVISION, FOUR SELECTED REGIONS, CANADA, 1961-71

| INDUSTRY | PRAIRIES | | | S.W. ONTARIO | | |
|---|---|---|---|---|---|---|
| | M | F | TOTAL | M | F | TOTAL |
| Agriculture | -46,935 | 13,011 | -33,924 | -19,523 | 4,455 | -15,068 |
| Other Primary | 2,703 | 197 | 2,900 | 114 | 104 | 218 |
| Manufacturing | 4,171 | 1,194 | 5,365 | 11,207 | 5,655 | 19,862 |
| Construction | 1,5661 | 307 | 1,873 | 5,009 | 655 | 5,665 |
| Transportation, etc. | - 5,120 | - 463 | - 5,583 | 1,405 | 119 | 1,524 |
| Trade | 1,085 | 4,229 | 5,314 | 3,607 | 4,624 | 8,231 |
| Finance, insurance, etc. | 241 | 2,020 | 2,261 | 721 | 1,864 | 10,500 |
| Services | 3,598 | 11,298 | 14,896 | 6,500 | 12,185 | 18,685 |
| Public admin./defence | 2,299 | 3,229 | 5,528 | - 881 | 1,289 | 408 |
| Other/unspecified | 10,496 | 10,808 | 21,304 | 6,990 | 7,597 | 14,587 |
| TOTAL | -25,981 | 45,757 | 19,776 | 15,164 | 38,517 | 53,681 |

| INDUSTRY | N.E. ONTARIO | | | INNER GASPE/COTE-SUD | | |
|---|---|---|---|---|---|---|
| | M | F | TOTAL | M | F | TOTAL |
| Manufacturing | - 2,483 | 94 | - 2,389 | - 7,904 | - 169 | - 8,073 |
| Agriculture | - 2,944 | 41 | - 2,903 | - 5,456 | - 3 | - 5,459 |
| Other Primary | - 2,049 | 280 | - 1,769 | 2,203 | 525 | 2,728 |
| Construction | - 335 | 21 | - 314 | 484 | 54 | 538 |
| Transportation, etc. | - 1,832 | - 8 | - 1,840 | - 887 | - 88 | - 975 |
| Trade | - 1,309 | 328 | - 981 | - 281 | 124 | - 157 |
| Finance, insurance, etc. | - 149 | 252 | 103 | 209 | 134 | 343 |
| Services | 1,006 | 581 | 1,587 | 1,868 | 399 | 2,267 |
| Public admin./defence | - 2,629 | 362 | - 2,267 | 893 | 276 | 1,169 |
| Other /unspecified | 2,011 | 1,952 | 3,963 | 683 | 1,721 | 2,404 |
| TOTAL | -10,723 | 3,877 | - 6,846 | - 8,158 | 2,963 | - 5,195 |

Source: As per Table 4.28.

Table 4.33 RURAL LABOUR FORCE BY SEX AND MAJOR INDUSTRY DIVISION, INNER GASPE/COTE-SUD REGION, CANADA, 1961 AND 1971

| INDUSTRY | 1961 | | | 1971 | | | 1961-1971 | | |
|---|---|---|---|---|---|---|---|---|---|
| | M | F | TOTAL | M | F | TOTAL | M | F | TOTAL |
| Agriculture | 13,769 | 1,504 | 15,273 | 5,865 | 1,335 | 7,200 | -7,904 | - 169 | -8,073 |
| Other Primary | 10,901 | 83 | 10,984 | 5,445 | 80 | 5,525 | -5,456 | - 3 | -5,459 |
| Manufacturing | 4,562 | 420 | 4,982 | 6,765 | 945 | 7,710 | 2,203 | 525 | 2,728 |
| Construction | 3,846 | 26 | 3,872 | 4,330 | 80 | 4,410 | 484 | 54 | 538 |
| Transportation, communication & utilities | 4,477 | 583 | 5,060 | 3,590 | 495 | 4,085 | - 887 | - 88 | - 975 |
| Trade | 5,111 | 1,576 | 6,687 | 4,830 | 1,700 | 6,530 | - 281 | 124 | - 157 |
| Finance, Insurance & Real Estate | 401 | 351 | 752 | 610 | 485 | 1,095 | 209 | 134 | 343 |
| Services | 3,267 | 7,931 | 11,198 | 5,135 | 8,330 | 13,465 | 1,868 | 399 | 2,267 |
| Public Admin./ Defence | 1,202 | 169 | 1,371 | 2,095 | 445 | 2,540 | 893 | 276 | 1,169 |
| Other/Unspecified | 2,392 | 624 | 3,016 | 3,075 | 2,345 | 5,420 | 683 | 1,721 | 2,404 |
| TOTAL | 49,928 | 13,267 | 63,195 | 41,770 | 16,230 | 58,800 | -8,158 | +2,963 | -5,195 |

Source: As per Table 4.28.

the corresponding rate in other regions. Here too, the rise in the reported work of rural women may reflect a change in reporting behavior, and, to that extent will have resulted in an underestimation of the rate of decline in the rural work force participation rate.

### 4.4.6 Summary and Conclusions

Of ten regions chosen for study, three appeared to have had serious problems of declining rural population between 1961 and 1971. While the rates of rural population decline in these three regions were comparable, the main causes show considerable variation between regions. One of these three regions, the Prairie region, is of major importance from the point of view of aggregate agricultural productivity. Another important agricultural region, S.W. Ontario, did not experience rural population decline, but was also examined in some detail for comparative purposes.

It appears that, in all regions, two phenomena, - a decreasing number of jobs in the 'Agriculture' sector and an increasing desire among rural women to participate in the work force, have put a downward pressure on both the total employment of males and the total rural population. In addition, in the N.E. Ontario and Inner Gaspé/Côte-sud regions, the impact of these two phenomena has been reinforced by a significant contraction of employment in other, non-agricultural sectors.

In the S.W. Ontario region, it appears that the effects of the two phenomena just mentioned were more than nullified by the expansion of all other sectors in the rural economy, with the result that total rural population and total employment of rural males both increased significantly, and the participation rate of rural males in the work force declined only marginally to remain at 79 percent in 1971.

In the Prairie region, the sheer dominance of the agricultural sector as an employer meant that an expansion in most other sectors was not enough to prevent a decline in rural population and in male employment, between 1961 and 1971. Again, however, the decline in the work force participation rate for rural males was only marginal, - to 77 percent in 1971. 'Agriculture', in 1971, provided 43 percent of Prairie rural employment. If, in the current decade, 1961-71 rates of change in employment in 'Agriculture' and other sectors were to prevail again, it is improbable that total rural population would again decline, - because of the diminished importance of agriculture and the fact that the absolute rise in total rural employment would be considerably higher than in the 1961-71 period. The probability of further significant increases in the per-family demand for paid employment appears more difficult to predict. It is suggested that considerable further increases in the desire of rural women to work and/or a considerably reduced rate of growth in the non-agricultural sectors would be needed for the Prairie

region to register another decline in rural population in the current decade.

In the N.E. Ontario and Inner Gaspé/Côte-sud regions the relative importance of agriculture in the rural economy has already declined to a point where further farm consolidation cannot have a large impact on total rural population changes (Table 4.31). If there is a tendency for work force participation rates in the Inner Gaspé/Côte-sud region to move up more in line with those in the other three regions, then further rural population decline could occur here even in the absence of further economic contraction.

The simple regional breakdown adopted for this analysis would require refinement. The mixed results, in terms of some CDs showing a rise and others a fall in rural population, obtained for the Winnipeg fringe and Eastern Townships/Côte-sud regions attests to this (Table 4.24, part E). It may be that a purely geographical breakdown, at this level of aggregation, is insufficient for some parts of the country. Certainly more work needs to be done to isolate the underlying forces determining rural community growth and decline. A considerable amount of objective analysis is required yet before conclusions about the magnitude of relationships between farm consolidation and rural population can be made with a desirable degree of confidence.

## 5. THE CANADIAN FARM INPUT SUPPLY SYSTEM - HIGHLIGHTS

1975

1. Canadian farmers have $6.4 billion invested in farm machinery today, or 15 percent of total farm investment. Current annual sales are over $1.0 billion but sales tend to be cyclical depending on the strength of Canadian farm incomes. Over 80 percent of the farm machinery sold in Canada is imported, largely from the United States. The industry is dominated by a few, big multi-national firms but small firms have been successful in producing specialized products or supplying components to the large firms. With most of the North American market for farm machinery in the United States, Canadian production, principally combines, amounts to only 10 percent of North American output. Retail distribution is largely through franchised dealers of whom there are about 2,000 in Canada.

2. Canadian farmers use over 1.2 million tonnes annually of the three primary fertilizer nutrients. The effect of commercial fertilizers on crop production has been estimated to be as much as an increase of 50 percent. Total expenditures by farmers for fertilizers and limestone amounted to over $485 million in 1975. Sales, however, tend to be cyclical depending on the strength of world grain markets. Most of the fertilizers sold in Canada are manufactured here but large imports of phosphate rock are necessary. However, these imports are more than offset in Canada's fertilizer trade balance since more than 80 percent of the total volume of the three primary nutrients produced in Canada is exported, largely to the United States. The manufacturing sector consists of a few large firms, mostly U.S.-owned, and several farmer-owned cooperatives. The retail distribution system includes about 230 bulk blending plants, mostly located in Eastern Canada. In Western Canada, distribution is largely through local representatives of the manufacturers and the cooperatives, (i.e. the wheat pools and farmer supply cooperatives.)

3. Consumption of agricultural chemicals increased rapidly in the years 1950 to 1975 and now represents an annual expenditure by farmers of over $155 million. This is still, however, a small percentage of total farm operating expenses. The Canadian pesticide industry is mostly a formulation one since a large part of the basic ingredients are imported. Imports of agricultural chemicals in 1975 totalled over $110 million, while exports were less than $17 million. Imports enter Canada duty-free at present. The companies which serve the Canadian market are, for the most part, U.S.-owned.

1975 (continued)

Research and development expenditures are high, and increasingly so. Hence, a large market is essential. While a few formulators dominate the industry, it is still highly competitive because different company products compete for the same use. Retail distribution is carried out by many of the same agencies which also handle fertilizers, feeds and other farm supplies. It has been suggested that pesticides offer the best short-run solution for increasing world agricultural output because of their high benefit-cost ratio, provided that they are used in a manner not detrimental to the environment.

4. Canadian farmers use seed obtained both from their own production and purchased from specialized seed producers. The trend, however, is toward more purchased seed and this expenditure by farmers now accounts for $200 million a year. Canada produces seeds of most cool-climate crops for domestic use and export, especially cereals, corn, oilseeds and forages, but there is only limited vegetable seed production. Total seed exports in recent years have been worth about $20 million. This country has a relatively large seed breeding program, mostly publicly financed, but private plant breeders are becoming more important. Distribution of commercial seed (pedigreed and non-pedigreed) in the domestic market is largely through private seed companies, integrated seed grower-processors, and farmer's cooperatives.

5. Canadian farmers spend over $1.0 billion annually on commercial feeds purchased from non-farmers. The purchases represent one-fifth of the total operating expenses of all Canadian farmers but feed costs account for 80 percent or more of the operating costs of specialized livestock and poultry producers. The feed industry is a relatively large one in terms of annual sales and it employs around 15,000 people. The industry is highly competitive with an average profit level estimated to be about 3 percent of total sales.

6. Canadian farmers spent about $464 million on petroleum products in 1975 but agriculture is still a relatively minor user of fossil fuels in the economy as a whole, both directly and indirectly. Total direct and indirect use in agriculture accounts for only about 4.5 percent of total Canadian consumption for all purposes. But farm use accounts for about one-fifth of the total energy required to put food on the table. In the short-run it will be difficult to effect any significant fuel conservation measures in farming but, in the longer-run, some savings may be possible. Alternative viable sources of energy are also limited. Should any fuel allocation plan become necessary, agriculture rates as a high priority user.

1975 (concluded)

7. Canadian agriculture has been assuming an increasing debt load in the review period. In 1975, debts as a percentage of total farm assets amounted to 19 percent compared with 9 percent in 1951. Relative costs of debt servicing have increased from five percent of total farm operating expenses to 10.5 percent between the same years. The banks have traditionally been the main source of short and intermediate-term credit for farmers but the federal government, through the Farm Credit Corporation, is the major source of long-term credit, with 70 percent of the total long-term credit extended.

8. Farming provided employment in 1975 for less than 500,000 persons, or five percent of the total employment in Canada. In 1950, agriculture accounted for 18 percent. The hired farm labor wage bill in 1975 amounted to $506 million, nine percent of farm operating costs but less than 50 percent of all farms hired labor. In 1950, hired labor wages accounted for 13 percent of farm operating expenses. A large proportion of hired farm labor is seasonal in nature and this presents recruitment problems. Levels of compensation and fringe benefits are also generally less than in other industries. Even at competitive wages and working conditions, farm labor is difficult to obtain and retain because of factors such as isolated job locations and limited job security. While governments and farmer organizations are working together to find solutions, hired farm worker representatives are only marginally involved in the process.

# 5. THE CANADIAN FARM INPUT SUPPLY SYSTEM

## 5.1 MACHINERY AND EQUIPMENT

The capital costs of owning farm machinery, together with associated operating expenses (excluding labor), represent a large proportion of the total farm operating and depreciation expenditures of Canadian farmers. During the past quarter century, these costs have accounted for a relatively constant 30 percent of total farm costs. In the same period of time, the total investment in machinery and equipment more than tripled, increasing from $1.9 billion in 1951 (20 percent of total farm investment) to $6.4 billion in 1975 (15 percent). However, in constant 1961 dollars, the increase in machinery investment was only 33 percent. But, expressed in relation to employment in farming, the investment per farm worker has increased more than 2.5 times.

The change in demand for new farm machinery, as evidenced by the increase of only 33 percent in the physical stock of machinery and equipment on Canadian farms in 25 years, suggests that the market is relatively mature. The principal short-run determinant of demand for farm machinery in this period has been lagged net farm income. A longer-run determinant is the so-called machinery replacement cycle of about 8 to 9 years, some evidence of which has appeared in the review period. Machinery prices, per se, appear to be weak determinants of demand and are principally reflected through changes in manufacturers' or dealers' discounts and dealers' discounts and dealers' trade-in allowances.

### 5.1.1 Volume and Nature of Business

In 1975, farm implements, equipment and parts sales in Canada reached a record high of $1.1 billion at dealer's acquisition prices. This was an increase of $766 million from the 1970 level, which was the lowest reached since 1963 (Table 5.1). These sales represent purchases by farmers of a wide variety of machinery, but over the past ten years the most important single items sold have been tractors and combines. These two items (with parts) have made up about 37 and 8 percent, respectively, of the total value of sales. Harvesting equipment (including combines) and haying machinery have been the most important groups of equipment, accounting for 20 and 7 percent, respectively.

### 5.1.2 Industry Structure

The manufacturers of agricultural equipment sold in Canada operate in a highly concentrated North American-wide industry. The major producers serving the North American market are large multi-national firms, most with headquarters and manufacturing plants located in the United States. The top four firms ship about 47 percent of the total dollar volume of industry sales and the top eight ship 61 percent. The top eight firms include John Deere, Massey-Ferguson, International Harvester, J.I.

Table 5.1 PRINCIPAL STATISTICS ON THE CANADIAN FARM MACHINERY INDUSTRY AND MARKET, SELECTED YEARS, 1952 to 1975

| Year | Manufacturing Plants | Total Employment in Manufacturing | Value Added in Manufacturing Activity | Value of Manufacturers' Shipments[a] | Total Imports[b] | Total Exports[b] | Total Sales[b] | Deflated Value of Machinery on Farms per Farm Workers[c] |
|---|---|---|---|---|---|---|---|---|
| | (No.) | (No.) | ($000,000) | ($000,000) | ($000,000) | ($000,000) | ($000,000) | ($) |
| 1951 | n.c. | 17,236 | 72.7 | 171.2 | 195.1 | 106.4 | 264.4 | 2,869 |
| 1955 | n.c. | 11,753 | 54.5 | 113.9 | 178.2 | 76.0 | 181.6 | 3,653 |
| 1961 | 67 | 10,058 | 61.2 | 139.0 | 213.4 | 85.5 | 141.4 | 3,767 |
| 1966 | 105 | 14,498 | 140.6 | 328.3 | 418.4 | 182.5 | 478.9 | 5,468 |
| 1967 | 113 | 14,553 | 137.4 | 323.4 | 353.2 | 194.3 | 494.3 | 5,555 |
| 1968 | 117 | 12,107 | 120.4 | 270.1 | 326.7 | 173.0 | 442.1 | 5,585 |
| 1969 | 124 | 12,063 | 123.0 | 289.8 | 320.5 | 187.1 | 410.1 | 5,618 |
| 1970 | 123 | 9,816 | 103.0 | 226.7 | 262.8 | 169.0 | 344.0 | 5,729 |
| 1971 | 130 | 8,888 | 102.3 | 239.7 | 322.5 | 187.5 | 400.0 | 5,581 |
| 1972 | 132 | 10,638 | 141.0 | 317.2 | 407.3 | 227.6 | 508.1 | 5,988 |
| 1973 | 135 | 12,477 | 184.8 | 423.4 | 541.5 | 302.5 | 681.2 | 6,386 |
| 1974 | 143 | 15,194 | 270.0 | 571.9 | 771.9 | 415.3 | 845.9 | 6.675 |
| 1975 | n.a. | n.a. | n.a. | 745.6p | 1,083.4 | 574.6 | 1,110.3 | 8.609 |

[a]Value of all new machinery and parts produced by industries classified under S.I.C. 311; 73-88 percent of these shipments are farm machinery and equipment.

[b]These three columns are only roughly comparable both among themselves and with the "Value of Shipments" column. Some of the factors affecting the comparability of all four columns are the following: (a) Three of the columns are exclusively farm machinery while the "Value of Shipments" is not. (b) The way in which shipments between an international company's branches are assessed depends on such things as tax advantages; the values reported for exports and imports vary accordingly. (c) "Sales" include only sales by Canadian dealers and do not reflect purchases (imports) by Canadian farmers directly from United States dealers. (d) "Sales" are reported at dealers' buying prices which are higher than the 'factory cost' values reported by some producers. (e) Dealers' sales in any year may include inventory carry-overs from previous years, not just this year's imports and production.

[c]Calculated in constant 1961 dollars based on all Canadian averages of workers employed in agriculture.

p = preliminary; n.a. = not available; n.c. = not comparable

Sources: (1) Statistics Canada, Cat. 42-202, 62-004, 63-009, 63,203, 65-007, 65-004 and 71-001.
(2) Statistics Canada Daily, August 27, 1976, Cat. 11-001E.
(3) Statistics Canada, Quarterly Review of Agricultural Statistics, Cat. 21-002.

Case, Ford, Allis-Chalmers, White Motor Co. and Sperry-New Holland. Of these dominant firms, only Massey-Ferguson has its headquarters in Canada.

A significant aspect of the North American farm machinery industry is that agricultural machinery production is of secondary importance to most of the top eight firms. Only Massey-Ferguson and John Deere credit more than half of their total equipment output to farm machinery production. For the other six firms, agricultural machinery production accounts for only 2 to 31 percent of their total output. Hence, the North American agricultural machinery industry giants can be described as well-diversified, multi-national conglomerates, flexible enough to withstand the fluctuations of the highly cyclical, agricultural machinery market (Figure 5.1).

### 5.1.3 Competitiveness

Despite the lack of product specialization in its top firms, the agricultural machinery industry behaves like an oligopoly. John Deere is recognized as the price-setter and there is little real price competition among established companies. Instead, these firms compete on the basis of the quality of their products, dealer service and the technical advantages of their machines. The large firms (the top eight) are noted for absorbing small firms that have introduced and successfully marketed a new product.

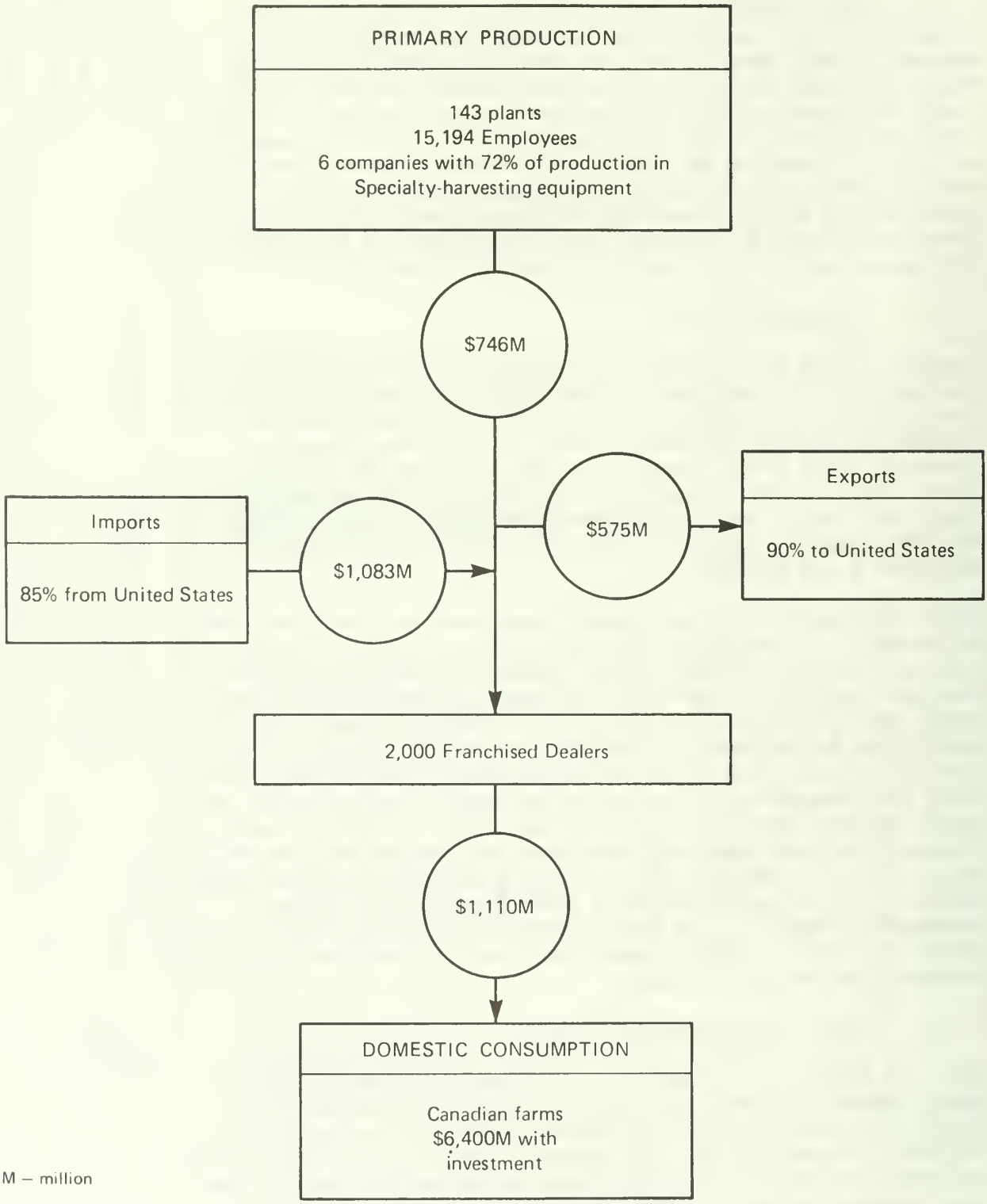
Under the umbrella of the large firms, smaller companies such as Versatile of Winnipeg have been able to enter the North American market and survive for several reasons. First, with the wide variety of specialty products in the implement business, small companies can compete in selected segments of the market not of interest to the conglomerates. Secondly, the high overall average cost level in the industry enables small firms with low overhead costs to enter and compete by marketing their products more cheaply than the large firms. Thirdly, small firms often have conceived new ideas and introduced new products into the market, thereby gaining an advantage over the large firms and establishing a foothold. Finally, large companies frequently use small independent firms as sources of parts or even of complete machines, thereby contributing to the survival of the small firms.

### 5.1.4 Distribution and Servicing

With an industry as complex as this, most farm machinery in North America is marketed through independent dealers franchised by the manufacturers. These dealers either handle the products of one firm or complementary products of several. Only a small portion of the total trade is handled by cooperatives and dealers who sell implements produced by firms that specialize in one or two products.

The top eight manufacturers have been increasing the size and decreasing the number of dealerships over the past 15 years or

FIGURE 5.1
FARM MACHINERY INDUSTRY, CANADA, 1975




M – million

more. This change began when they tried to eliminate small dealers to reduce costs between the manufacturer and retailer. More recently, it has occurred because of the large repair shops and skills of technical personnel needed to service modern farm machines. Since the time-critical nature of farming demands that prompt, efficient servicing be available at short notice, the three prairie provincial farm machinery boards, for example, have encouraged this consolidation by insisting that licensed dealers in their provinces have suitable repair and service facilities. There are estimated to be about 2,000 farm implement dealers in Canada now, of whom around 1,300 would be in the west. (The estimate for the east could be low.) By comparison, there were about 2,700 dealers in Canada in 1951, according to Statistics Canada data. The recent estimate assumes, it should be noted, that a dealership is an establishment primarily selling new farm machinery valued at more than $1,000 per machine. Thus, establishments such as general automotive supply stores and non-specialized establishments would be excluded. This definition is more likely to understate the number of dealerships in the east than in the west, also.

### 5.1.5 Product Pricing

Because of the nature of the distribution and manufacturing structures of the industry, there is a fairly rigid pricing system in the sale of farm machinery, just as there is in the automobile industry. The wholesale price is usually 71 to 73 percent of the suggested retail price and the farmer's price is negotiated between these two extremes. At any one time, the price paid by the farmer depends upon various factors including the strength of demand for farm machinery, current capital utilization of the manufacturer, trade-in values of used machinery, dealer inventories and dealers' costs or volume of business.

One example of the workings of the farm machinery pricing mechanism is to be found in the sharp price increases experienced in North America between 1973 and 1975. These were due to the short supply of machinery following a period of depressed sales, coupled with suddenly improved farm incomes which generated unanticipated strong demands. Under such conditions, farmers' market bargaining power was reduced and the companies prospered.

### 5.1.6 The Canadian Machinery Market

The foregoing description applies to the entire North American farm machinery market and industry of which Canadian machinery producers have only a small part, 10 percent of the total North American production at most. Generally, however, the description is as apt for Canada as it is for North America as a whole.

Although the largest producers in Canada are not the same as the top eight in North America (Versatile is important in Canada), the concentration of production in the hands of a small number of corporations is also a major characteristic of the Canadian industry. Indeed, it appears to be even stronger in Canada than in North America as a whole because, in 1974, eight plants (probably six companies) accounted for 72 percent of total production. The remainder was divided among 135 plants, mostly small, independent producers. Canadian producers also are concentrated geographically since 66 percent of the production came from Ontario plants in 1974 while 20 percent originated in Manitoba.

Because many of the agricultural implement firms in Canada are subsidiaries of United States companies, most of Canada's manufacturers are owned and controlled from abroad. In 1973, Canadians owned only 32 percent and controlled only 36 percent of the capital invested in the Canadian agricultural machinery-producing establishments. These proportions are slightly below the average for Canadian manufacturing and have declined since 1968 when they were 42 and 53 percent, respectively.

One way in which the Canadian and total North American farm machinery output patterns diverge is in the orientation of production. With only one tractor producer (Versatile) in Canada, Canadian production is focused on harvesting equipment and not on tractors as is the case for North America as a whole. About 34 percent of total Canadian production is devoted to harvesting equipment while tractor manufacturing probably makes up about 10 percent of the total.

Employment in the Canadian farm machinery industry presently totals about 15,000 people (Table 5.1). The majority of workers (55 percent) are in plants with less than 20 employees. While employment in the industry today is higher than it was in 1970 and 1971, it is still 2,000 persons fewer than in 1951. Capital investment in the industry has not increased but, in real terms, declined in the review period. In 1973, investment was estimated to total $264 million in the manufacturing sector, about the same as in 1968 and 1969. The small size of the Canadian farm machinery market, as a proportion of the total North American market, has inhibited growth of the industry in Canada and seems likely to continue to do so. While the value of shipments of manufacturers in 1975 was at its highest level for the review period, the increase was largely due to higher prices.

### 5.1.7 International Trade

Some of the product specialization of Canadian producers has been a direct result of the policy of free trade for agricultural machinery in North America, in effect since 1944. The absence of tariff barriers, therefore, likely has facilitated Canada's specialization in harvesting equipment (mainly combines) and, more recently, has enabled Versatile to expand its tractor production.

The absence of trade barriers with the United States, while encouraging Canada's sizeable international trade in farm machinery (Table 5.1), has made Canada heavily dependent on the United States as both a supplier and a market. Over 90 percent of Canada's exports go to that country and over 85 percent of this country's imports originate there. Most of the remaining trade is with Europe. Over 80 percent of Canadian farm machinery sales are imports.

Canada has an annual net deficit in agricultural machinery trade and, in 1975, it reached $508 million, 180 percent greater than it was in the 1966-1968 period. Only the trade in combines has been in Canada's favor over the past ten years and, in 1975, Canada's net trade balance amounted to $96 million.

The main reasons for the overall trade deficit probably include the difficulties of market penetration for Canadian exports on a world scale and the orientation of the major United States producers towards the larger United States market.

## 5.2 FERTILIZERS

The consumption of fertilizers by Canadian farmers increased in the 1950-75 period from 193,000 tonnes of the three primary nutrients (nitrogen, phosphorus and potassium) to 1,232,000 tonnes. Expenditures on fertilizers and limestone in the same period increased from $40.3 million to $497 million and accounted for nine percent of farm operating expenses in 1975.

The principal determinants of the demand for fertilizers are fertilizer prices and crop prices. However, in Western Canada, the moisture conditions at planting time also affect the use of fertilizers significantly. Overall, consumption of fertilizers by Canadian farmers between 1960 and 1975 increased more than fourfold but fertilizer prices only doubled. Crop prices in the same period also doubled.

### 5.2.1 Volume and Nature of Business

Food production depends heavily on the maintenance of soil fertility which in turn depends on adequate usage of fertilizers containing the three major plant nutrients, i.e. nitrogen, phosphorus, and potassium. Canada is the world's 14th largest consumer of these three major plant nutrients but ranks fifth in production and is the world's largest exporter of plant foods, principally potash. Canada's fertilizer industry has evolved through several stages since its beginning in 1869, each stage being closely connected to mineral resource development. Minerals, including petroleum products, are the basis of practically all commercial fertilizers sold today.

From 1950 to 1960, Canadian consumption and production of fertilizers increased only modestly (Table 5.2). However, beginning in 1965, the use of fertilizers in Canada expanded

Table 5.2 PRINCIPAL STATISTICS OF THE CANADIAN FERTILIZER INDUSTRY AND MARKET, SELECTED YEARS, 1950 to 1975

| Year | Manufacturing Production Capacity | | | Total Value of Production | Total Manufacturing Employment | Total Imports | Total Exports | Total Domestic Consumption | Fertilizer Price Index | Total Farm Inputs Price Index |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | $P_2O_5$ | $K_2O$ | | | | | | | |
| | 000 tonnes of nutrient | | | $000,000 | No. | 000 tonnes of product | | 000 tonnes of nutrient | 1961=100 | |
| Column | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| 1950 | 450 | 128 | - | 42.2 | n.a. | 280 | 539 | 191 | 75.5 | 74.6 |
| 1955 | 677 | 243 | - | 59.8 | n.a. | 385 | 736 | 211 | 93.1 | 84.4 |
| 1960 | 724 | 298 | - | 68.2 | n.a. | 322 | 872 | 279 | 100.1 | 98.0 |
| 1965 | 833 | 567 | 1,787 | 179.3 | 2,000 | 397 | 2,171 | 555 | 102.8 | 112.0 |
| 1970 | 1,170 | 929 | 6,995 | n.a. | 4,500 | 126 | 4,960 | 909 | 96.4 | 131.3 |
| 1975 | 1,170 | 990 | 7,492 | 866.3 | 8,200 | 257 | 8,492 | 1,220 | 203.0 | 215.4 |
| 1976 | 1,467 | 990 | 7,492 | n.a. | 8,000 | n.a. | n.a. | n.a. | 184.5u | 229.7u |

n.a. = not available u=unofficial estimate

Sources: (1) Canadian Fertilizer Institute (cols. 1-5).
(2) Statistics Canada, Cat. 46-207 (cols. 6-8). Imports exclude phosphate rock. In 1974/75, these amounted to 2.6 million tonnes compared with 1.5 million in 1970/71.
(3) Statistics Canada, Cat. 62-004 (cols. 9-10). Indexes given are annual averages.

very dramatically and, by 1970, total consumption of nutrients was near one million tonnes. Following the cyclical pattern of grain exports, consumption of fertilizers has also been highly cyclical in Western Canada in the short term, but, over the longer term, the annual growth rate has averaged about 6.5 percent. However, annual fluctuations of -15 percent to +25 percent have not been uncommon. Consumption of nitrogen has increased the most rapidly in the years since the mid-1960's, 10.5 percent a year, followed by phosphates at 4.8 percent and potash at 4.1 percent.

### 5.2.2 Industry Structure

The majority of fertilizer production facilities in Canada have been built to world scale capacity to derive the necessary economies of large scale production. These conditions are evident by the fact that close to 80 percent of the total volume of nitrogen, phosphate, and potash fertilizers manufactured in Canada are exported to markets around the world. The fertilizer industry in Canada is composed of two distinctive groups, namely an eastern and a western group of producers. The Canadian fertilizer industry consists of the following production facilities: 15 basic fertilizer production plants producing ammonia and/or phospahtes; 10 potash mines with related refineries; and 230 (approximately) bulk blending facilities. The Western Canadian industry includes eight nitrogen plants with an annual capacity as N of almost one million tonnes, seven phosphate plants with a production capacity as $P_2O_5$ of almost 600,000 tonnes and 10 potash mines with a production capacity in terms of $K_2O$ of 9.5 million tonnes a year. In Eastern Canada, there are four nitrogen plants with production capacity as N of 591,000 tonnes and five phosphate plants with $P_2O_5$ capacity of about 364,000 tonnes a year. The majority of the blending plants are located in Eastern Canada (Figure 5.2).

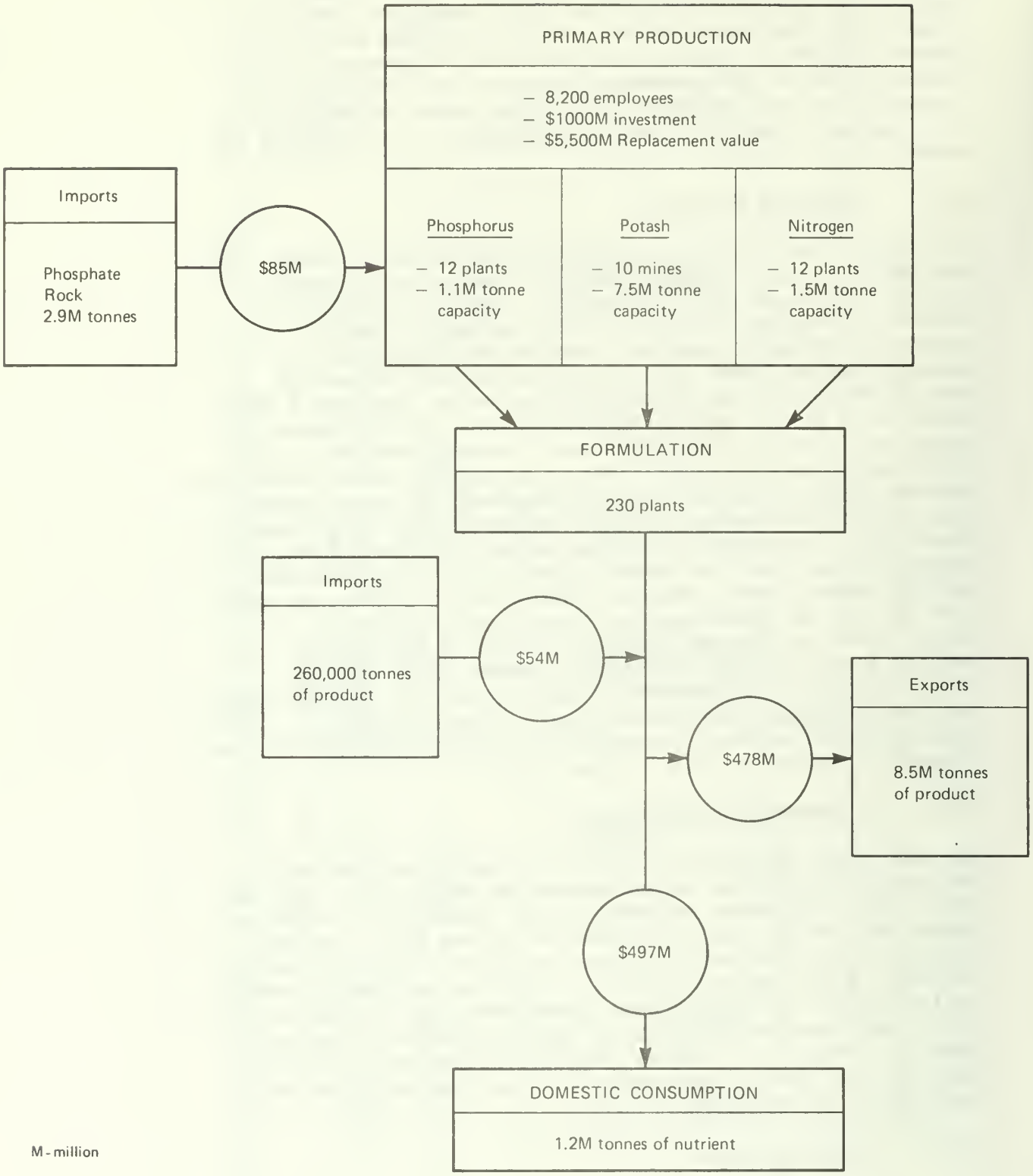
### 5.2.3 Investment and Employment

The fertilizer industry is a source of employment for highly skilled professionals, technologists and technicians. Of the more than 8,000 people employed by the industry, it is estimated that better than 65 percent are in the highly skilled category, while another 20 percent may be classified as semi-skilled. The industry is capital intensive and capital assets at investment cost levels were approximately $1 billion in 1975 with significant expansion under way in nitrogen production that will amount to a further $600 million by 1977. In current dollars, the cost of replacement of these assets is estimated at close to $5.5 billion.

### 5.2.4 Competitiveness

The Canadian fertilizer industry is highly competitive, especially as it must cope with imports from the large number of diversified United States manufacturers. In 1976, the

FIGURE 5.2
FERTILIZER MANUFACTURING INDUSTRY, CANADA, 1975




M - million

Department of Consumer and Corporate Affairs laid charges against all basic manufacturers in Western Canada under the Combines Act for attempting to fix the price of fertilizer during the period 1965-75. The outcome of these charges has not been resolved at the date of writing.

### 5.2.5 Distribution and Technology

In Eastern Canada, the retail distribution system for fertilizers is much more extensive than in Western Canada as most fertilizers sold to eastern farmers are in the form of blends consisting of nitrogen, phosphorus, and potassium. These fertilizers are physically mixed by small blending plants located close to the consumer and are prepared usually according to the individual's requirements. The fertilizer ingredients most frequently blended in the east are ammonium nitrate, urea, di-ammonium phosphate, and muriate of potash. Prior to the introduction of bulk blending facilities in the early 1960's, fertilizers were for the most part produced by a few large centrally located granulating plants, which by means of chemical reaction combined the nitrogen, phosphorus, and potash materials fo form mixed fertilizers. Due to the lack of flexibility in producing the numerous different formulations of fertilizers demanded by farmers, and the generally higher costs of production and transportation for granulating plants, most of these plants have been replaced by bulk blending facilities in recent years.

Since most soils in Western Canada, with the exception of some in the coastal areas of British Columbia, contain adequate potash levels and because most cereal crops grown in the prairies do not require nitrogen to the same extent as in Eastern Canada, blended fertilizers are seldom offered to or required by the prairie farmers. Consequently, most of their fertilizer requirements are met by applying directly to the soil actual chemicals, e.g. urea, ammonium nitrate, and ammonium phosphate. In the east, most soils require complete fertilizers, the type varying with the crop and soil type. For example, crops such as corn and tobacco are heavy users of nitrogen while cereals and oilseeds require less nitrogen relative to other nutrients.

Most basic producers of fertilizers control or own outright blending facilities and/or bulk storage facilities throughout their marketing area and are able to provide technical knowledge to their customers through these outlets. This includes use of suitable equipment for taking soil samples, analysis of these samples, and the making of recommendations on nutrient needs for crops based on the analyses. In addition to local representatives, most large suppliers of fertilizers also have specialists on staff who may be consulted for specialized technical information needed by farmers.

### 5.2.6 Product Pricing

Fertilizer prices were low in relation to those of other farm inputs up until 1973. However, the strong demand for fertilizers in the world in 1974-75 resulted in major increases in fertilizer prices. For example, the farm input price index as prepared by Statistics Canada shows that over this two-year period fertilizer prices practically doubled. However, in 1976, fertilizer prices declined as supplies improved and demand weakened for all nutrients. It is expected that up until 1980-81 supplies of fertilizers will be adequate and price increases will only be moderate, reflecting such cost factors as increases in transportation costs, basic material costs, and petroleum feed stocks.

### 5.2.7 International Trade

There are virtually no tariff barriers or quotas for fertilizers in the world. The Canadian fertilizer industry over the last decade has developed export sales of significant proportions, particularly in the case of potash (Table 5.2). For example, in 1975 total sales exceeded $478 million. As previously mentioned, close to 80 percent of the total production of nitrogen, phosphatic, and potassic fertilizers manufactured in Canada is exported. In North America, a single trading area with north-south flows has developed, based on location of raw materials, transportation, and soil nutrient requirements. Such factors have produced two major producing and consuming areas, one comprising Western Canada and the Western United States, and the other Eastern Canada and Eastern United States. With the exception of potash, most of the nitrogen and phosphate fertilizers exported from Canada are to United States markets. In the case of potash, 70 percent of our production is exported to the United States, 20 percent offshore, with 5 percent remaining for domestic use. Canada is also an importer of fertilizers and fertilizer materials, principally phosphate rock. In 1975, total imports were $139 million of which phosphate rock accounted for $85 million.

### 5.2.8 Conservation of Basic Resources

The raw materials for fertilizers come directly from nature. Although by-products from the steel industry and waste from food producing operations were once major sources, they have become less important with the development of efficient manufacturing process for commercial fertilizers. In the case of nitrogen, hydro-carbons (natural gas being the source used in Canada) are utilized as a source of hydrogen and energy in the nitrogen fixation process. Thirteen hundred cubic meters of natural gas are required to produce one tonne of ammonia; this is equivalent to approximately one-quarter of the natural gas required to heat the average Canadian home for one year. The nitrogen so produced is in the form of anhydrous ammonia, which may be applied directly or used to build other fertilizer materials. Coal, another hydro-carbon, also may be used to produce nitrogen fertilizers; at present however, prices, the cost of change-over and the average production cost are much

higher for ammonia/urea plants using coal for their energy and hydrogen requirements than for plants using natural gas.

Phosphorus for fertilizers comes from phosphate rock (calcium phosphate ore) found in a few areas of the world. Since Canadian deposits of phosphates are generally of a very low grade and quality and are difficult to mine efficiently, all of the phosphate rock used is currently imported from the United States, mainly Florida but also Idaho, Montana, and Wyoming. Canadian phosphate fertilizer manufacturers process the phosphate rock into a form suitable for plant nutrition by treating it with sulfuric acid (a by-product from the metal industry and the petroleum industries), phosphoric acid, or nitric acid.

Canadian potassium supplies are obtained from subsurface bedded potash deposits in Saskatchewan. In contrast to phosphate rock, potash ore can be used directly in the form of potassium chloride, often called muriate of potash, without extensive chemical conversion. Unfortunately, the deposits of potash are deeply covered by rock and soil. Thus two major problems in mining potash are removing the ore from depths up to 8,800 meters and then separating the unwanted compounds from the ore.

The province of Saskatchewan's deposits of potash in terms of quantity and quality are without equal anywhere in the world. The beds of potash are 2-3 meters in thickness and are remarkably flat and regular. The average grade of the ore is between 20 percent and 28 percent potassium oxide ($K_2O$). These reserves are estimated at more than 45 billion tonnes of potassium oxide or enough for the next two thousand years at current annual rates of production (about 5.9 million tonnes of $K_2O$).

The effect of commercial fertilizers on crop production has been put as high as an increase of 50 percent. Some studies have indicated that one tonne of fertilizer will substitute for 600 hours of labor. With farm production requiring about 5 percent of the labor force, compared to 75-80 percent a century ago, the impact of fertilizers is obvious. Both human and animal diets have benefitted by the use of fertilizers through increased protein content in crop quality, but perhaps the most significant benefit of fertilizer use is its ability to intensify food production on a given area of land and thereby feed an increasing population. Through fertilizer use, land in some areas is even more productive today than it was when the native sod was broken.

### 5.2.9 Pollution Problems

There are two dimensions to fertilizer's role in man's environment - production and use. Production processes can affect both air and water quality. Fertilizer use raises questions as to the fate of applied nutrients in reference to

ground and stream water. Fertilizer production processes emit certain amounts of nitrogen gas and sulfur oxides, fluorine, particulates, and mineral acids, the maximum allowable rates for which have been set by provincial guidelines in the provinces of Ontario and Alberta, where most of the manufacturing occurs. Currently, the industry is working with Environment Canada to establish national guidelines for both air and water pollution control.

There can be two forms of nutrient loss to the environment through fertilizer use. First, a portion of the nutrients harvested through crops eventually finds its way into other ecosystems through animal waste losses and crop processing wastes. Secondly, there can be a loss of applied fertilizer nutrients through soil leaching and water runoff. However, present knowledge indicates that if recommended practices and rates of application are used, fertilizers account for a relatively small, although measurable, fraction of agriculture's nutrient pollution of water supplies. The nutrient of most concern is nitrogen which is a highly mobile element in most soils. However, current evidence is that any condemnation of fertilizers as a primary or secondary environmental threat is not justified.

## 5.3 PESTICIDES

Consumption of agricultural pesticides in Canada has increased from only $10 million worth in 1950 to over $155 million in 1975. But this cost is still no more than about 2 percent of total farm operating expenses.

Although prices of pesticides have increased sharply in recent years, consumption is largely still a function of the acreage in crops, the size of the livestock herd and the size of the pest problem. Also, in the review period, chemical herbicides, for example, have been especially cost-effective in substituting for more costly, and often less effective, cultural control practices.

### 5.3.1 Volume and Nature of Business

During the latter stages of World War II, the pesticides DDT and 2,4-D emerged as the forerunners of synthesized compounds that largely characterize the vast spectrum of products now available to control pests. Prior to this time, chemical pest control was primitive and was dependent upon simple inorganic compounds based on copper, mercury, arsenic, fluorine, boron, sulphur and chlorates together with the 'botanicals' which are products derived from plant sources and consisting of pyrethrum, rotenone and ryania. By 1950, DDT, a powerful insecticide, and the herbicides 2,4-D and 2,4,5-T had been joined by a number of new insecticides: aldrin, chlordane, benzene, hexachloride, methoxychlor, parathion and tetraethylpyrophosphate, as well as a family of plant disease control agents, the dithiocarbamates.

From 1950 to the present, there has been a rapid increase in the quality and value of products sold for the control of agricultural pests.(Table 5.3)

Table 5.3 PESTICIDE SALES, CANADA, 1950, 1974 and 1975

| | Insecticides | Fungicides | Herbicides | Total |
|---|---|---|---|---|
| | | - $000 - | | |
| 1950 | 2,475 | 2,125 | 5,700 | 10,300 |
| 1974 | 17,700 | 8,200 | 79,800 | 105,700 |
| 1975 | 19,223 | 8,882 | 127,148 | 155,253 |

Source: Statistics Canada, Cat. 46-212 Annual. Data are for 12 months ending September 30. Standardized quantity data for these broad categories of pesticides are not possible. These data exclude seed dressings, livestock insecticides and plant growth regulants.

The types of pest control products used directly in agricultural production or contributing to it include insecticides, fungicides, herbicides, algaecides, antimicrobials, insect repellents, feed preservatives, molluscides, plant growth regulants, seed treatments, antibiotics, vertebrate pest control agents (birds and rodents), and others. However, herbicides historically have accounted for the largest proportion of the commodity group. The marked increase in herbicides sales in recent years is attributable to greater availability and utilization of wild oat control chemicals in the Prairie Provinces. Insecticides and fungicides used to control storage pests have also increased in importance in recent years and it is likely that further increased will take place in this use category.

Of the 688 registrants listed under the federal Pest Control Products Act, only about 100 registered products were used to control pests in agriculture. In 1975, approximately 2,100 pest control products containing a selection (usually one) from 300 active ingredients were registered for use in agricultural production or food storage purposes. In 1950, there were only about 75 active ingredients, and only a few of these are still retained as effective and safe by current standards.

### 5.3.2 Industry Structure

The Canadian pesticide industry is characteristically a formulation industry. Only two companies synthesize basic active ingredients. Dow Chemical Limited and Uniroyal Chemical both synthesize 2,4-D and 2,4,5-T and the latter also synthesizes a seed treatment fungicide. The remaining actives (95 percent) are imported from the United States, the United Kingdom, Europe and Japan. Thirty to forty companies formulate 50 percent of the pesticides used in Canada, the remainder being imported as 'ready-to-use' products. Three of the formulator companies are responsible for 65 percent of the pest control products sold in Canada. All three are located in southern Ontario and market

their products across Canada. The principal remaining companies are regionally oriented, servicing agriculture by formulating their own products or marketing imported formulations according to the needs of the region.

The number of suppliers is best estimated by excluding the retail agencies since, in most cases, pesticides are marketed at this level along with other inputs such as fertilizers, feed and machinery. Technical and advisory services are largely provided by the supplier, although no firm rule is applicable. Excluding the staff of retail outlets, the total current employment in the pesticide industry is estimated at 1,200 persons. It follows that the Canadian pesticide industry is small and highly specialized (Figure 5.3).

### 5.3.3 Distribution and Technology

Expert sales representatives residing in each of Canada's agricultural regions, are in direct contact with farmers. In addition, technical service personnel of the major suppliers work across Canada in product development and 'trouble shooting', when this is needed.

### 5.3.4 Investment and Employment

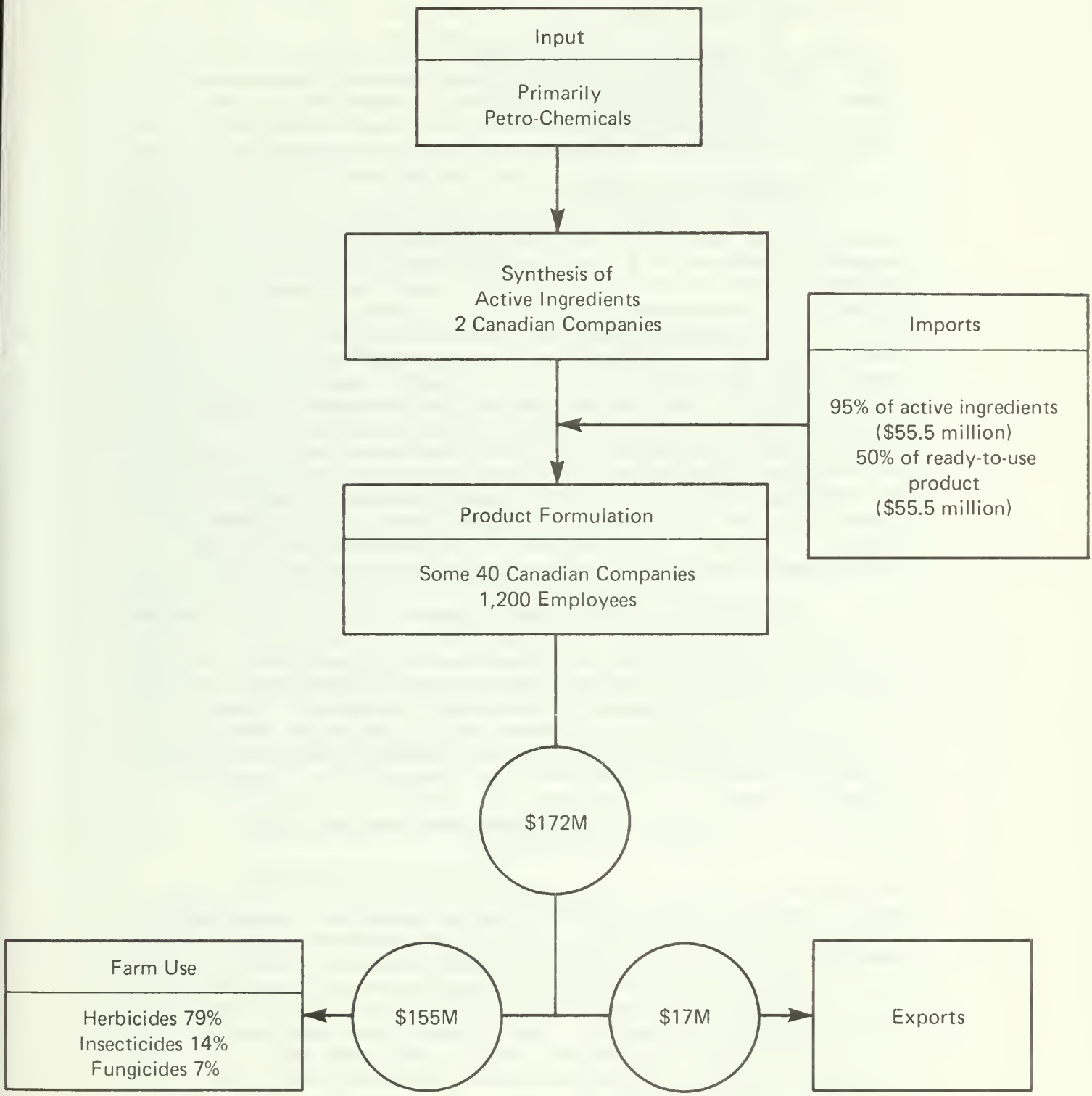
There are no readily available figures on investment in plant facilities in respect to the pesticide industry in Canada. A recent (1976) estimate of the cost of constructing a nine million kilogram (acid equivalent) phenoxy herbicide plant was $23 million. Pesticides are a dynamic commodity group and new compounds emerge at the rate of about 10 to 15 a year. There is a continuing research and development cost to the industry, occasioned by regulatory requirements under the federal Pest Control Products Act and the companies need to develop products suited for Canadian conditions. For the 12 major companies carrying out research and development in Canada, the collective estimate for 1975 was that 113 persons were involved and $1.5 million was spent in that year on product development. These companies also reported testing facilities including research farms, laboratories and equipment value at $1.0 million. Canadian subsidiaries of foreign corporations have available basic performance data on new active ingredients from their parent companies. However, the costs of obtaining these basic data are rising markedly due to the increasingly complex information requirements of the regulatory authorities with respect to human health safety and environmental quality.

### 5.3.5 Product Pricing

A trend appears to have been established of moderately increasing prices for chemical pesticides, attributable mainly to two factors:

(1) Longstanding products that are found to exert undesirable effects, e.g. DDT, aldrin, heptachlor and mercury, are being phased out of use by regulatory directive. These

FIGURE 5.3
**AGRICULTURAL CHEMICAL INDUSTRY – 1975**




M – million

compounds are usually lower in cost since the developmental and plant costs have long since been written off. Replacements are narrower in their spectrum of control, and are inherently more costly.

(2) Petrochemicals are increasing in cost and this will be reflected in higher prices for all derived products.

### 5.3.6 Competitiveness

The pesticide industry is highly competitive in nature and will likely continue to be so. For each pest problem, there are a number of products developed by different companies that are competing for the same use. Each has unique advantages in timing, application, persistence and spectrum of control.

### 5.3.7 International Trade

Canadian plant facilities presently synthesizing basic active ingredients are not of a 'world scale'order and produce only for the Canadian market. Some of the larger formulators are attempting to take advantage of foreign markets, but only $16.6 million of formulated product was exported in 1975. This figure is small in relation to the value of active ingredients imported for the Canadian pesticide industry, amounting to $110.7 million. The Canadian agricultural chemicals industry has submitted briefs to the federal government seeking a greater equality in tariffs and other regulatory matters that are now imposing a limitation on expansion of this industry. For example, while in 1975 agricultural chemicals entered Canada duty-free from the United States, that country levied a duty of 3.7 cents a kilogram plus 12.5 percent and higher, *ad valorem*, against Canadian exports of the same products.

### 5.3.8 Conservation of Basic Resources

Virtually all pesticides, including the active ingredients, solvent systems and essential surface active ingredients, are derived from petroleum-based products and feedstocks. Thus, their continuing supply is dependent upon a depleting resource - petroleum. However, the use of pesticides in agriculture an forestry enhances the conservation and protection of these renewable resources. It follows that mankind's requirements for food is in jeopardy to the extent that the ability to produce it is dependent upon petroleum.

The Food and Agriculture Organization of the United Nations had stated that pesticide use offers the best immediate resolution of the 'world food shortage', and that the long-term supply is dependent upon man's ability to continue to control pests that are in competition for the same food source. It is estimated that 30 percent of the world's current food production is being lost to uncontrolled insects, plant diseases and weed competition. It is also estimated that the present level of food production is 30 percent higher than it would be without the pesticides now in use. Thus, about one-third of Canada's annual crop production of $4.0 billion is attributable to an

expenditure of $155 million, a benefit-cost ratio of 8.0.

### 5.3.9 Pollution Problems

Relatively small quantities of pesticides are used per unit area to achieve control of pests in agricultural crops. Nevertheless, because of the biologically active nature of pesticides, there is a continuing concern for the likelihood of any given pesticidal compound leaving residues on the agricultural crop or in the environment where the crop is grown. The potential for pollution is always present, therefore, and it is held within specified limits only by strict regulation and close adherence to the limitations in use imposed on each pesticide. But the spectre of misuse is always present, as is the continuing possibility of the discovery of new information on previously unsuspected detrimental effects from individual active ingredients. Hence, on-going pre-release research and post-release monitoring of pesticides is essential if detrimental effects are to be avoided.

## 5.4 SEEDS

Seed is the initial input for all crop production and traditionally, the farmer saved a portion of his crop for planting the next one. Many still do although the advent of improved crop varieties and hybrids has led to an increasing dependence on specialized seed producers. Purchased seed supplies represent an annual outlay by Canadian farmers of $200 million, or three precent of farm operating expenses. This compares with only about $50 million at the beginning of the 1960's, then two percent of farm operating costs.

The changes that occurred in seed production, imports, exports and consumption in Canada between 1950 and 1975 reflect a number of identifiable causes. These include such factors as cyclical changes in the world demand for grains and oilseeds, changes in cropping practices such as the introduction of new species, e.g. rapeseed, the diminished use of others, e.g. sweet clover, changes for agronomic or economic reasons in the Canadian ability to produce seed of particular species, and a gradually increasing demand for high quality seed of improved varieties.

### 5.4.1 Volume and Nature of Business

#### Cereals Seed Production

Considering the large areas involved in producing the three major cereals, wheat, barley and oats, the Canadian cereal seed production and marketing industry is relatively simple and underdeveloped. Between 1950 and 1975, the situation changed slowly as the yield and area of pedigreed seed increased (Table 5.4). In the prairies, farmers still tend to buy pedigreed cereal seed only once every three to four years, and then save seed from the multiplications of this purchase. Farmers in Ontario, and to a lesser extent Quebec and the Maritimes, are

more likely to obtain their seed from a seed company or seed grower, although most cereal seed sown is also non-pedigreed.

The sale of pedigreed cereal seed in the Prairie Provinces is largely from seed grower-processors. There are about 500 of these vertically integrated operations producing, processing and selling pedigreed seed. In addition, the grain pool organizations have a significant share of the market for cereal seeds (Figure 5.4).

### Corn Seed Production

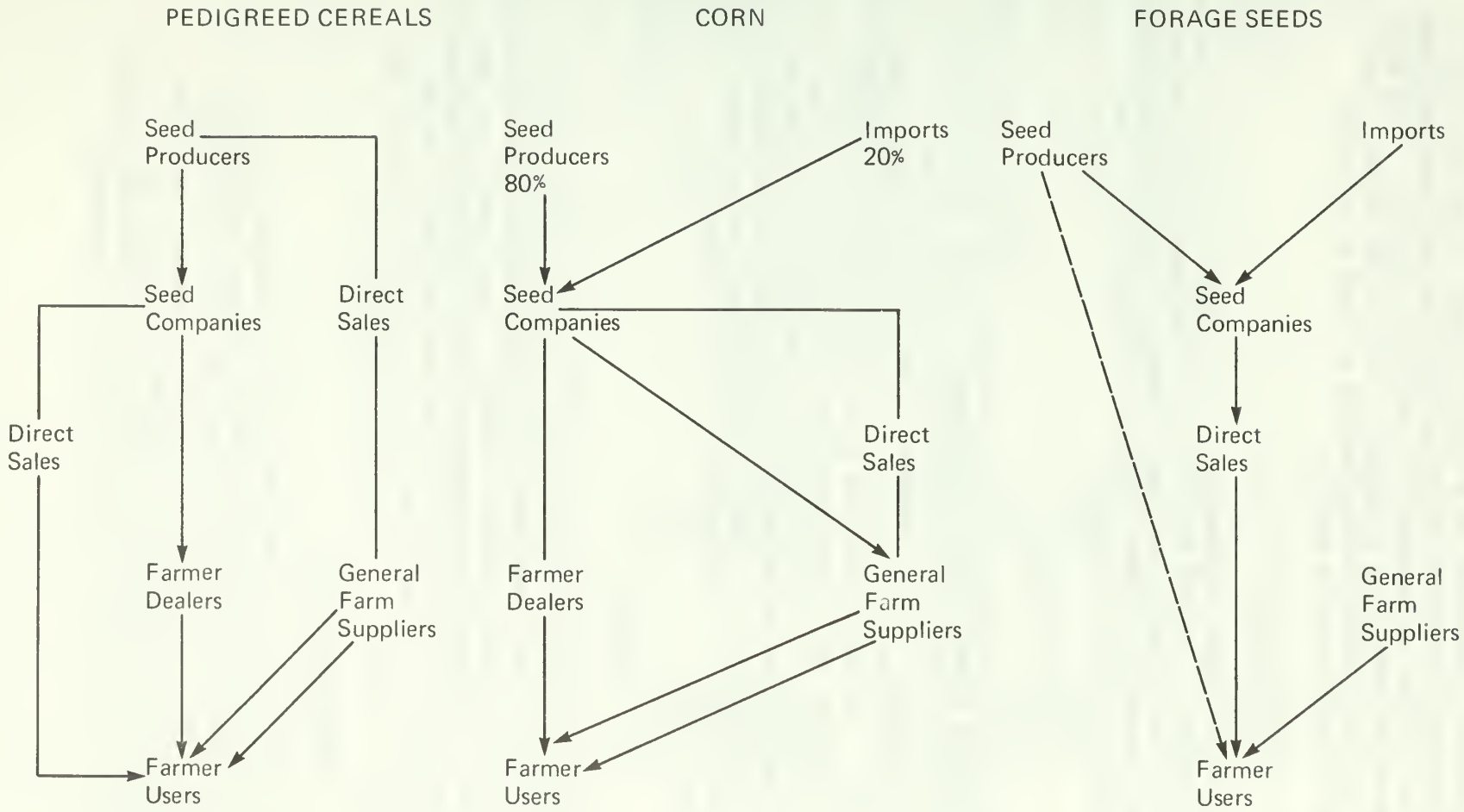
One of the most dramatic changes for any crop acreage in the period from 1950 to 1975 has occurred with corn. The introduction of new hybrid varieties capable of maturing under cooler, shorter growing seasons, greatly increased corn acreage. The hybrids do not breed true, so farmers must buy new seed each year. This, combined with the specialized seed production techniques for corn hybrids, has led to the development of a strong corn seed industry. There are more than 30 companies, each very competitively selling their own hybrids. More than 80 percent of the seed is produced in Canada, with the remainder being imported from the United States.

### Forages Seed Production

Forage seed tends to be a more specialized type of production than cereals, i.e., the grower has the intention of producing seed. Traditionally, timothy, red clover and alfalfa have been harvested for seed or for hay in Ontario and Quebec according to relative prices and to growing conditions. However, this choice in production diminished greatly between 1950 and 1975 because the market for the non-pedigreed seed produced was disappearing with legislative actions in other countries and demands by forage seed users for pedigreed seed of improved varieties.

The limited Canadian domestic demand for forage seed, the more specialized nature of forage seed processing equipment, compared with that used for cereals, and the fact that there is no alternative use for the seed, have resulted in forage seed marketing being handled almost entirely by the seed trade. Speculative production of forage seed has greatly diminished for most species and has been replaced by contract pedigreed seed production. The one major exception is the production of creeping red fescue seed in the Peace River district of Alberta and British Columbia. This production, which increased greatly between 1950 and 1975, is still largely on a speculative basis but, even with this species, the trend is towards production on contract.

FIGURE 5.4 **CANADIAN SEED DISTRIBUTION SYSTEM, 1975**




Many sales are made by growers.

All sales are through companies.

Most sales are made through companies.

### Oilseeds Production

Of the four oilseed species grown in Canada (flax, soybean, sunflower and rapeseed), the major changes occurring between 1950 and 1975 affected flax and rapeseed, while soybeans and sunflowers remained regional crops in south-western Ontario and in southern Manitoba and Saskatchewan, respectively. Flax has diminished in importance as a crop although it was still being sown on more than 400,000 hectares in 1975. The first pedigreed rapeseed production occurred in 1954 on 15 hectares. The crop has grown in importance to occupy a much larger acreage than flax, with pedigreed seed production on more than 10,800 hectares in 1975 (Table 5.4).

## 5.4.2 Seed Varieties

There has been some improvement in the general quality of seed on the market in Canada because of the increase in the availability of seed cleaning equipment. However, the major advances in seed technology between 1950 and 1975 have been in the development of new varieties.

### Cereal Varieties

Fewer varieties of wheat, barley, and oats were recommended for sale in 1975 than in 1950. The number of wheat varieties fell from 53 to 32, barley varieties from 43 to 34, and oat varieties from 52 to 31. However, these figures conceal the fact that there was an increase in the diversity of varieties available. Varieties tend now to be superseded more rapidly and growers are more ready to switch to superior varieties. Indications of the diversification of varieties are shown in the recommendation of spring wheat varieties for uses other than bread making, e.g. Pitic 62 and Glenlea, and of oats in the development of a high protein variety, Hinoat, for breakfast foods.

### Corn Varieties

In 1950, there were 26 open-pollinated and 107 hybrid corn varieties recommended. By 1975, the open-pollinated varieties had disappeared and there were 279 hybrids listed, with 45 to 50 new hybrids being licensed annually. Corn hybrids are now expected to remain on the market only about five years before being replaced. Corn production has been extended from the original area in southwest Ontario to the warmer parts of all provinces. Production is for both silage and grain.

### Forage Varieties

Between 1950 and 1975, there was a large increase in the diversity of varieties and of kinds of forages available to Canadian farmers. New species, such as sainfoin and cicer milkvetch, were introduced and the first improved varieties were selected of kinds such as Russian wild rye; reed canarygrass; and intermediate, pubescent, streambank and tall wheatgrass. The number of alfalfa varieties recommended

Table 5.4 SEED PRODUCTION IN CANADA, 1950 and 1975

| Hectares Inspected for Pedigreed | 1950 | 1975 |
|---|---|---|
| Wheat | 41,098 | 69,176 |
| Barley | 11,463 | 37,091 |
| Oats | 20,472 | 25,863 |
| Rapessed | - | 10,931 |
| Alfalfa | 10,065 | 2,164 |
| Timothy | 10 | 10,031 |
| Total | 89,240 | 212,866 |
| **Pedigreed Seed Sealed**[a] | | |
| Cereals (tonnes) | 53,841 | 111,045 |
| Forage (tonnes) | 1,367 | 9,844 |
| Number of Seed Growers | 3,689 | 4,644 |
| | Annual Average | Annual Average |
| Total Seed Production (000 kilograms) | 1946-55 | 1970-74 |
| Alfalfa | 4,454 | 1,142 |
| Red Clover | 3,901 | 4,756 |
| Alsike Clover | 2,550 | 3,581 |
| Sweet Clover | 8,081 | 4,310 |
| Timothy | 6,125 | 5,377 |
| Creeping Red Fescue | 1,505 | 10,210 |
| Bromegrass | 4,419 | 1,860 |

[a]Sealed in bags and certified as to variety.

Source: Plant Products Division, Agriculture Canada.

increased from 13 to 28 with many more being tested each year. For all forages, the trend has been away from common seed and towards the use of pedigreed seed of improved varieties. This has been accelerated by a change in the Seeds Regulations limiting the use of variety names to pedigreed seed.

### Oilseed Varieties

There were 10 fibre and 18 oilseed flax varieties licensed in 1950. With the termination of the fibre flax industry there were by 1975 only ten oilseed flax varieties recommended. The major advance in flax has been the development of rust resistant varieties but yields still remain low.

Rapeseed perhaps has shown the greatest change of any oilseed crop in Canada in varietal development. The original varieties selected produced oil containing erucic acid which was subsequently implicated as a possible health hazard. New varieties, low in erucic acid content, have been developed, and by 1975, there was also a variety low in glucosinolate content of the meal, an important factor for animal feeds.

### Vegetable Varieties

During World War II, it became necessary to develop a vegetable seed production industry in Canada. In the immediate post-war years, this industry continued and, in 1950, seed of 18 kinds was produced. However, climatic conditions for most vegetable seed production are more favorable in the United States where there is also a much larger home market, a longer growing season, and a demand for a greater diversity of varieties. Canadian production has fallen steadily in quantity and number of species and by 1975 only eight species were produced in significant quantities, including peas, onion, sugar beet and turnip (rutabaga).

## 5.4.3 Breeding Programs

Agriculture Canada has by far the most important plant breeding program in the country with variety development taking place in all major crops. There are also significant breeding programs at Macdonald College, and the universities of Guelph, Manitoba, Saskatchewan and Alberta.

There was no significant private plant breeding in Canada in 1950. Since that time, grants from the National Research Council have been used to start programs in several seed companies. Most of the activity has been in breeding varieties of corn, with most companies either employing a plant breeding staff in Canada or having links with companies in other countries having breeding programs. Considerable aid has been given to these private programs by Agriculture Canada through the release of inbred lines and hybrids to companies.

One private company has a plant breeding program over a wide range of species (Stewart Seeds Limited), and several

others have more limited programs. Those that are subsidiaries of foreign companies or linked with companies in other countries, bring in varieties produced in foreign breeding programs for testing.

Many countries have introduced Plant Breeders' Rights legislation enabling owners of varieties to protect their varieties and claim royalties on their use. Such legislation is presently being studied for its possible application in Canada.

### 5.4.4 Competitiveness

Competition in the seed industry varies considerably according to crop. In cereals, the competition is between pedigreed seed and common seed. Pedigreed seed producers cooperate in the promotion of their product. The price of seed grain is always related to the price of grain. If seed prices rise too high, a farmer will use his own grain or that of a neighbor for seed. There is now more traditional competition between companies dealing in forage seed, as most have at least some proprietary varieties which they promote. However, the strongest competition is in the seed corn industry with more than 30 companies already in the business and others planning to enter. Since hybrids are by their nature exclusive products, they are heavily promoted and each company attempts to gain business by selling through a network of farmer-dealers.

### 5.4.5 International Trade

In 1975, 24,130 tonnes of vegetable and field crop seeds valued at $22.9 million were imported into Canada. About 90 percent of vegetable seed imports come from California, with much of the remainder from Europe. Approximately 60 percent of imports are packeted in Canada by a few large seed companies, while the remaining 40 percent is packeted abroad (mostly in the United States) and distributed by a number of smaller firms to various types of retail outlets.

The only kinds of seeds which have been exported from Canada in significant quantities have been vegetable and forage seeds. These exports were worth $18 million in 1975, compared with $25 million in 1974 and about $13 million in 1966. Forage seed predominates in the total.

#### Vegetable Seed Trade

In the immediate post-war years, the vegetable seed production industry in Canada was able to produce more seed than was required on the domestic market. Seed exports were still significant in 1950, although the number of kinds exported had fallen to 11 as compared with 18 kinds exported in 1947. After 1950, production and exports declined rapidly to small quantities of 6 kinds in 1958 and no significant export thereafter. The rapidity of the disappearance of this export industry can best be illustrated by the bean crop. More than 4,500 tonnes

were exported in 1950, less than 90 tonnes in 1951, and none after 1954.

## Forage Seed Trade

Forage seed exports have been affected by world seasonal production factors causing shortages or surpluses. In addition, there have been cyclical variations in demand. Some species of major importance in 1950 are no longer significant export items, e.g. alfalfa and bromegrass, other species have increased in importance, e.g. creeping red fescue and meadow fescue, while demand for some others has remained steady, e.g. alsike and timothy.

After the war, Canada was one of the world's major suppliers of alfalfa seed for a period. A peak was reached in 1948 with nearly nine million kilograms exported. Seed production started to decline drastically in the 1950's as production recovered in other countries, and from 1954 onwards imports have exceeded exports in most years. By 1975, about 2.3 million kilograms were being imported annually.

Creeping red fescue exports were at a relatively low level in 1950 but increased steadily from just over 450,000 kilograms in 1951 to 4.5 million kilograms in 1958. Although the economic slowdown of the past few years have reduced demand for this lawn species, it was still the largest forage seed export (6.8 million kilograms) in 1975, as it had been in most years since 1960. Prior to 1960, sweet clover was the major export item but world use of this species has steadily declined.

Canadian forage seed is exported to many countries but the major outlets are the United States, the European Common Market and Japan. The nature of the market has altered in the review period. In 1950, demand was for Canadian common seed which had a reputation for high quality. Since that time, with the increase in breeding programs in Europe and Japan, a demand has developed for production of pedigreed seed of the importing-country's varieties or of varieties shown to be adapted there. To facilitate international recognition of pedigreeing programs, a series of seed schemes have been set up under the Organization for Economic Cooperation and Development. The original scheme was for herbage seeds but others have been added, the most recent one being for seed corn; this should facilitate corn production in Canada for export to Europe.

The forage seed export business from Canada involves relatively large quantities of seed and was worth $16 million in 1975. There are about 15 seed companies participating. The production of pedigreed seed of European varieties involves contracts with European companies and with Canadian growers and is a considerably more complicated business than the speculative sale of common seed of former years.

## 5.5 FEEDS

Feeds purchased by all farmers through commercial channels in 1975 were worth over $1.0 billion and accounted for one-fifth of total operating expenses. In 1950, farmers were spending only $267 million on feeds but this was almost one-quarter of farmers' operating costs. These figures are, of course, overall averages and feeds are a much larger proportion of the costs of specialized livestock and poultry producers. The demand for feed is derived from the demand for livestock and livestock products, but the relationship between feed grain and livestock prices and, in the short-run, the numbers of livestock and poultry on feed, are also determinants.

### 5.5.1 Volume and Nature of Business

The Canadian feed industry is Canada's 12th largest manufacturing industry producing 8.5 to 9 million tonnes of feed (Table 5.5) for annual sales of over $1.0 billion. This represents a near tenfold increase over 1950 sales of $155 million.

The industry produces feed for most classes of livestock. Mixed feeds such as complete feeds, supplements, premixes, mineral feeds, liquid feeds as well as injectable feeds, are required to be registered under the Feeds Act before sale. Livestock producers also can obtain feeds of their choice by way of a written formula produced and signed by them, or one prescribed and signed by a veterinarian. Medicating ingredients, e.g., coccidiostats, antihelmintics (blackhead control), anthelmintics (worming agents), growth promotants (antibiotics at a low level of 2-10 gms/tonne, arsenic acid derivatives) are cleared jointly by National Health and Welfare and Agricuture Canada.

There are 60 different drugs and about 900 combinations of these used in about 38 percent of the feed volume sold in Canada. Drugs are not permitted in feeds for laying hens or in feeds for dairy cattle. Broiler feeds, as well as milk replacers and vealer formulations, are virtually all medicated for the entire life of the livestock. Medicated feeds (feeds containing drugs) are monitored by inspectors of the Plant

Table 5.5 FEED REGISTRATIONS, CANADA, 1973/74

| Class | Total Registered | Percent of Total | Non-Medicated | Medicated | Approximate Tonnage |
|---|---|---|---|---|---|
| | No. | % | - No. - | | 000 |
| Feed Type: | | | | | |
| Complete | 4,685 | 60.5 | 2,462 | 2,223 | 5,445 |
| Supplement | 1,636 | 21.2 | 1,189 | 447 | 1,890 |
| Macro-Premix | 858 | 11.1 | 601 | 257 | 990 |
| Micro-Premix | 203 | 2.6 | 190 | 13 | 234 |
| Mineral | 297 | 3.8 | 288 | 9 | 342 |
| Injectables | 60 | .8 | 60 | - | - |
| Total | 7,739 | 100.0 | 4,790 | 2,949 | 8,901 |
| Livestock Species: | | | | | |
| Ruminants | 2,277 | 29.4 | - | - | 2,649 |
| Poultry | 2,120 | 27.4 | - | - | 2,465 |
| Turkey | 917 | 11.9 | - | - | 1,067 |
| Swine | 1,956 | 25.3 | - | - | 2,274 |
| Horse | 235 | 3.0 | - | - | 274 |
| Others | 234 | 3.0 | - | - | 272 |
| Total | 7,739 | 100.0 | - | - | 9,000 |

(-) nil or breakdown not available

Source: Production and Marketing Branch, Agriculture Canada.

Products Division of Agriculture Canada under the authority of the Feeds Act. The value of drugs in feeds in 1975 was approximately $1.7 million. At the present time, there are 30 companies manufacturing and selling medicating ingredients for inclusion in feeds.

The feed industry operates mainly by utilizing by-products of other industries and grades of grain not normally exported or used in the milling and cereal industries. There is a wide range of ingredients numbering about 250 in total, supplying protein, carbohydrates, fats, minerals, medicaments, flavoring agents, antioxidants, vitamins, pelletizing agents, and enzyme preparations. In 1974, the feed industry used 7.3 million tonnes of ingredients valued at $922 million (Figure 5.5).

### 5.5.2 Industry Structure

There are approximately 2,000 feed mills in Canada mising feeds and processing ingredients (soybean meal, meat meal, alfalfa meal, drug premixes, etc.) and approximately 15,000 to 20,000 farm mini-mix mills. These figures include about 100 mobile mixing mills but do not include farms with only a grain grinder or chopper.

Many feed companies, particularly those which are also involved in the food industry, have contracts with individual producers in the production of broilers, eggs or other livestock. Generally the companies provide the feed, often even pullets or other livestock, and the farmer sells the finished birds or livestock back to the company. It is very difficult to determine the number of contracts out at any given time as some contracts are made over definite periods of time while others are terminated once the animals or birds have been grown out.

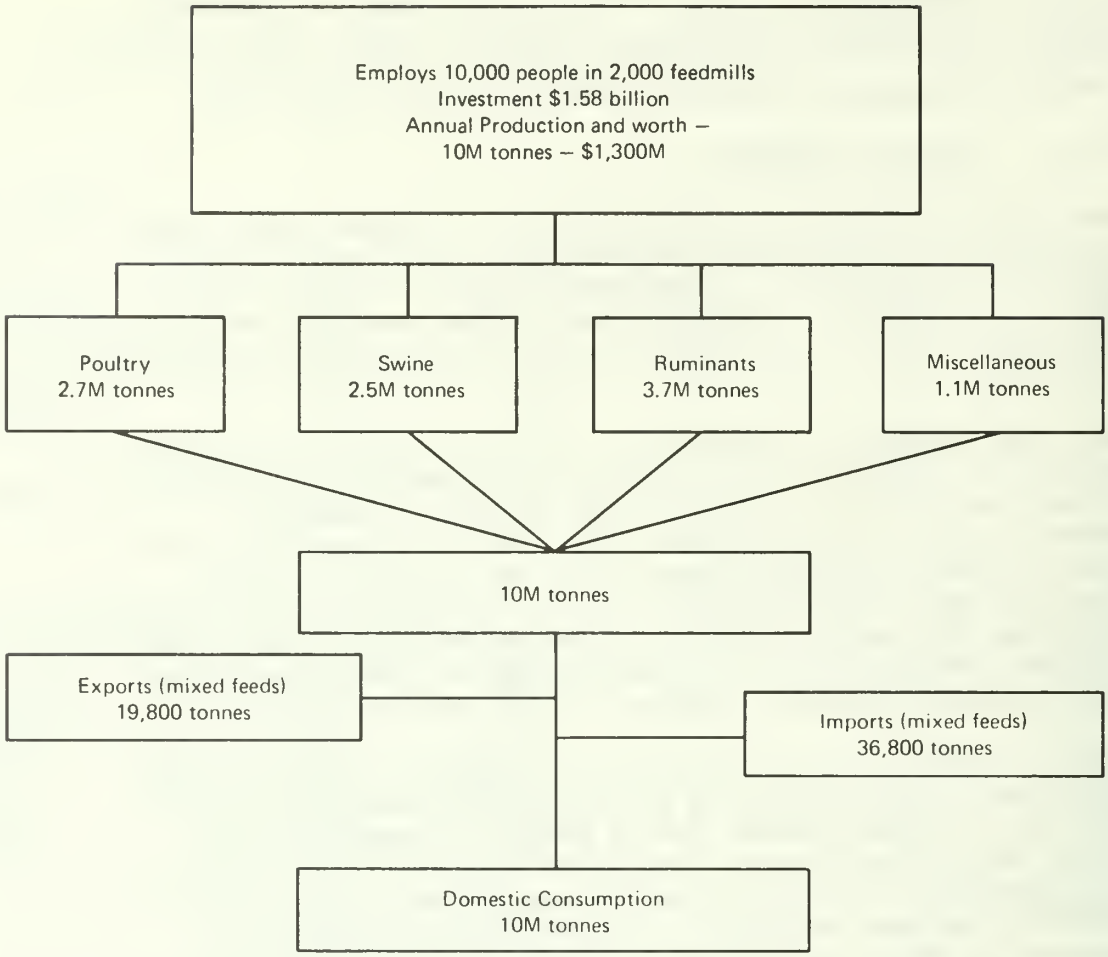
The feed industry is considered to be overbuilt at the present time. Only approximately 50 percent of available capacity is utilized in Western Canada and 70 percent in Eastern Canada, mainly Ontario and Quebec. The small feed mill is steadily disappearing and being replaced by on-farm mixing and a smaller number of medium-sized mills. The medium-sized mills are designed to offer specialized services, including technical expertise, and to purchase grains from the farmer as well as sell feed to him. The location of feed mills, especially the newer ones, is dictated mainly by the size of the animal population in the area, particularly swine and poultry as swine feeds are high-volume and poultry feeds, being more sophisticated, permit a slightly higher mark-up than other feeds.

There has been a large increase in the past three years in on-farm mixing of feeds for the farmer's own use. In 1973, it was estimated that there were about 3,000 on-farm mini-mix mills compared to a 1975 figure of 15,000 to 20,000.

### 5.5.3 Pricing and Competitiveness

The pricing of mixed feeds is highly dependent on ingredients and fluctuations in their cost. These approximate 80 percent of the cost of a feed, and changes are reflected quickly in the

FIGURE 5.5
**PRIMARY PRODUCTION (MIXED FEEDS)**




M – million

selling price. The gross mark-up taken by the industry on feeds is said to be 15 to 20 percent of the selling price. Competition in the industry is very keen and tends to have a stabilizing effect with respect to quality and the price charged for goods and services. Net profit is said to be about 3 percent of the value of sales. Due to the number of companies in the medicating ingredient business, prices are very competitive and the quality of drug products has been shown to be acceptable so far.

### 5.5.4 Investment and Employment

The feed industry is estimated to employ about 15,000 people, with a total payroll of approximately $150 million. The hourly rate for labor is said to be between $4.50 to $6.00.

Feed mills providing the more complex services required by today's farmers are being constructed or purchased in the range of $500,000 to $2,000,000, with the norm considered to be around $750,000 to $1,000,000. The mini-mix mills purchased by farmers cost around $6,000 with mobile units in the range of $10,000 to $24,000. No estimates are available of total industry investment because of the wide variations in types of establishments and joint operations with other forms of business activity.

### 5.5.5. Pet Foods

The volume of business in feed for dogs, cats, birds and fish is estimated at 305,100 tonnes with a value of $160 million. Feeds for both cats and dogs are composed of dry, canned, semi-moist, biscuit and cereals. Fish feeds are mainly cereal-based feeds and are in a hard pellet form, the size depending on the age of the fish for which the feed is intended.

The Feeds Act covers fish by definition as a kind of livestock, and thus conveys authority to control the sale and manufacture of fish feeds. However, dogs, cats and birds are not included in the definition of livestock under the Feeds Act and Regulations.

Dog, cat and bird feed labels can be checked under the authority of the Consumer Packaging and Labelling Act for fraudulent or deceptive claims and displays. The animal materials used in such feeds can be checked under the authority of the Animal Disease and Protection Act with relation to the wholesomeness of the ingredients.

There are approximately 15 firms manufacturing cat, dog and bird foods in Canada. Fish feeds are manufactured by 5 or 6 firms. The base premix used in these feeds is, for the most part, imported from such countries as the United States, Holland and Sweden.

## 5.6 FUELS AND LUBRICANTS

Use of petroleum products in agricultural production in Canada amounted to $464 million in 1975, or eight percent of farm operating expenses. This compares with an expenditure of $153 million in 1951 when petroleum products accounted for almost 13 percent of farm operating costs. However, as noted in a previous section, machinery expenses, including fuel and depreciation, have accounted for a constant 30 percent of total farm costs in Canada during the past quarter century.

Petroleum products are a complementary input in Canadian agriculture, hence the demand for fuel is largely a function of the stock of power-driven equipment on farms. The greenhouse industry is the major user of natural gas but other petroleum products, including fuel oil, are also used. Ontario is the major greenhouse producing area in Canada, accounting for about 82 percent of the total. Over 75 percent of the greenhouse area in Ontario is heated by natural gas worth, at 1975 prices, $20.6 million to $33.7 million, depending on consumption levels. Consumption varies with the type of construction, outside air temperature, and other variables.

### 5.6.1 Volume and Nature of Business

Petroleum-based fuels are the largest single energy input (direct and indirect) of Canadian agriculture (Table 5.6). In 1973, direct use of petroleum products in farming accounted for two-thirds of the total energy consumed. Fertilizers were a distant second at 15 percent of the total.

Agriculture is not a large user of fossil fuels in the Canadian economy, accounting for only about three percent of the total in direct use and a total of 4.5 percent in terms of both direct and indirect use (Table 5.6). By user type, agriculture ranks at the bottom of the user groups specified in Table 5.7 with industrial use accounting for the greatest proportion 29 percent, followed by transportation at 25 percent. However, in the food production system, primary agriculture accounts for about 20 percent of the total energy required to place food on the table. Processing and packaging account for 32 percent, transportation and distribution for 20 percent, and household preparation for 30 percent.

The principal forms of fuel used in farming include gasoline, diesel fuel, natural gas, propane and heating oils. Farm use of diesel fuel has been increasing more rapidly than for gasoline in the past. The increase in consumption from 1968 to 1974 was 16 percent for diesel fuel and 5 percent for gasoline. Gasoline, however, still accounts for more than 70 percent of total farm use of the two fuels. Regionally, Western Canada consumes almost two-thirds of the gasoline and diesel fuel used in farming, reflecting the more intensive direct use of fossil fuels in crop production, as compared with livestock production.

Table 5.6 ENERGY USE IN CANADA, AGRICULTURE AND TOTAL, 1973

| Sector | kj | Share of Totals | |
|---|---|---|---|
| | | Agriculture | All Uses |
| | $10^{12}$ | - % - | |
| Agriculture:[a] | | | |
| Direct Use: | | | |
| Fuel | 179.6 | 66.9 | 2.95 |
| Lubricants | 3.2 | 1.2 | .05 |
| Total Direct | 182.8 | 67.2 | 3.00 |
| Indirect: | | | |
| Fertilizer | 41.8 | 15.4 | .69 |
| Chemicals | 3.4 | 1.2 | .06 |
| Machinery | 14.0 | 5.2 | .23 |
| Miscellaneous | 30.1 | 11.0 | .48 |
| Total Indirect | 89.3 | 32.8 | 1.46 |
| Total Direct and Indirect | 272.1 | 100.0 | 4.46 |
| Total, All Uses | 6,101.9 | | 100.0 |

[a]The estimates for agriculture were prepared in Agriculture Canada from Statistics Canada data and average conversion factors. The estimate for direct use refers to production only and excludes residential farm use.

Source: Statistics Canada, Cat. 57-207.

Table 5.7 ENERGY USE IN CANADA BY USER TYPE, 1973

| User Type | kj $10^{12}$ | Share of Total % |
|---|---|---|
| Industrial | 1,760.0 | 28.8 |
| Transport | 1,542.5 | 25.2 |
| Domestic and Farm | 1,155.8 | 19.0 |
| Domestic | 973.0 | 16.0 |
| Farma | 182.8 | 3.0 |
| Commercial | 785.8 | 12.9 |
| Energy Supply Industries | 676.3 | 11.1 |
| Non-Energy Users | 32.4 | 0.5 |
| Losses and Adjustments | 150.1 | 2.5 |
| TOTAL | 6,101.9 | 100.0 |

[a]The estimate for agriculture is from Table 5.6. The figure for domestic use is a residual calculation and it includes farm residential use.

Source: Statistics Canada. Cat. 57-207.

The distribution of fuels to farmers is undertaken by a large number of distributorships located throughout the farming areas and including those of all of the major oil companies, the farm supply cooperatives, and independent dealers. No estimate is available of the numbers of such agencies or the employment involved, many of whom also handle other farm supplies. Fuels are available to farm users both in bulk and at retail 'pump' outlets. However, the majority of farmers today probably buy most of their fuel needs in bulk, especially for farm tractor and truck use.

### 5.6.2 Pricing and Competitiveness

Since 1973, there has been a rapid escalation in fuel prices with 1975 prices up by almost 45 percent. This increase in two years was more than the total for the 1961-73 period. Higher fuel prices are a direct result of the growing world shortage of new, low-cost sources of fossil fuels and the pricing policies of the OPEC countries, which include most of the world's major oil producers. Canada being faced with this situation and having to import increasing quantities of oil from OPEC countries, prices of petroleum have been permitted to move towards OPEC levels in gradual stages in order to encourage more economical use of oil, and the search for new sources and alternatives.

At the retail level, price competition between the major Canadian suppliers is not evident, nor has there been any direct competition to date between agriculture and other users for the supply of fossil fuels. The federal government has a fuel allocation policy in place should this become necessary, and agriculture is designated as a high priority user.

### 5.6.3 Conservation of Basic Resources

While the application of current conservation techniques to the agricultural use of fossil fuels would not greatly affect farming costs at present prices, national and regional total consumption levels for all purposes could be affected. Agriculture is a relatively important user of fuel in the Prairie Provinces and any savings there would have a proportionately greater impact in the region than for the country as a whole. At the national level, a 10 percent reduction in farm fuel use would reduce the Canadian total by about one percent. Some of the possibilities for saving fuel in farming include changes in traditional cultural practices in favor of more chemical weed control and minimum tillage. Possibilities also exist for improved engine and machinery designs, especially the trend towards larger machinery and integrated systems.

In the longer-run, some avenues to reduce agriculture's dependence on fossil fuels may use biomass energy sources such as methane and alcohol. Also, other renewable sources, such as wind and solar energy, could help to reduce fossil fuel demand in grain drying, space and water heating applications.

## 5.7 FARM FINANCE

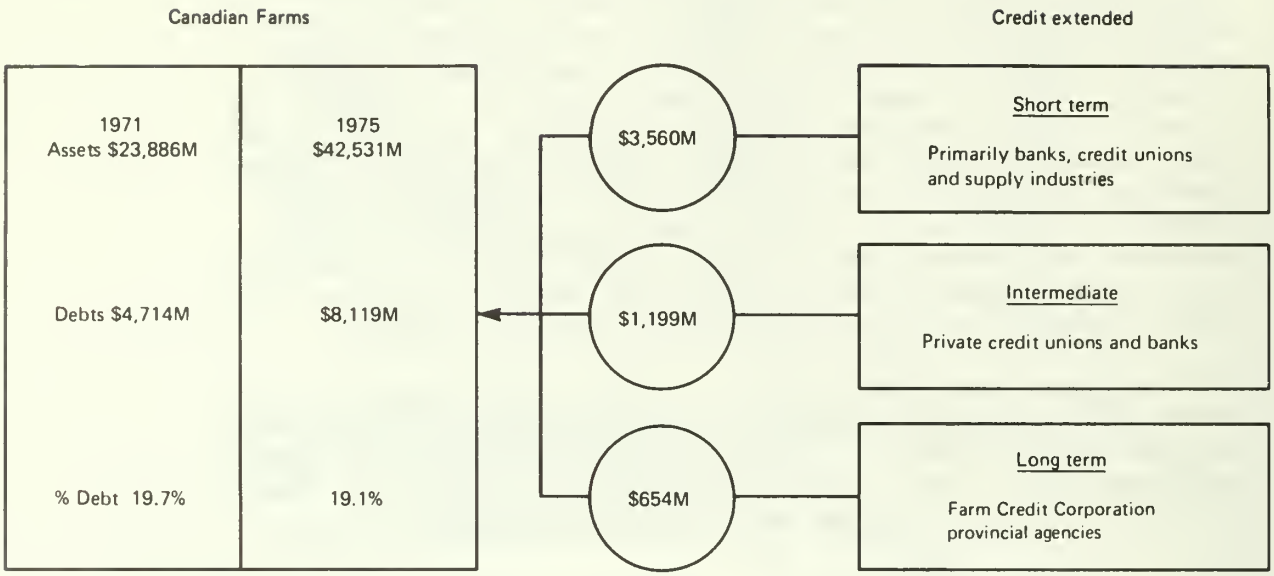
Between 1951 and 1975, farm capital investment increased more than four times. But farm debts increased nearly ten times and debts as a percentage of farm assets more than doubled (Table 5.8). This increase in assets occurred despite the area of occupied farm land declining slightly from 70 million hectares to less than 68 million (Figure 5.6).

Most of the increase in value of farm real estate values resulted from increased in land prices, but important amounts also resulted from improvements. Farm mechanization and higher machinery prices increased implement and machinery values several fold during the review period. At the same time, the number of farms declined by about one-half, and this, combined with the greatly increased total capital investment, resulted in an average increase in capital per farm of more than ten times. During the period, many farms evolved from small, self-sustaining enterprises, to highly commercialized business enterprises, farming larger acreages, using much less labor, employing modern machinery and technology, and financed increasingly from external sources. The costs to farmers of servicing their farm indebtedness increased from an estimated $60 million in 1951, five percent of farm operating expenses, to over $580 million in 1975, 10.5 percent of total farm operating costs.

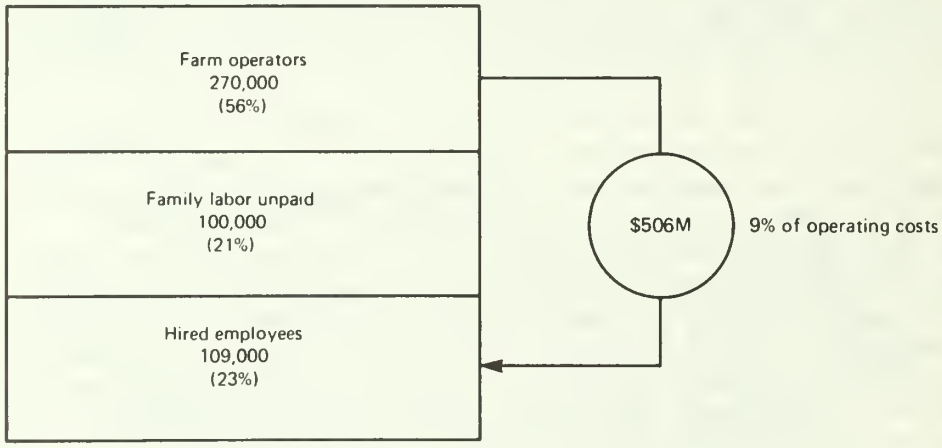
### 5.7.1 Farm Needs

The large increase in capital investment per farm has made it necessary for a larger part of this to be provided through

## FIGURE 5.6
## CANADIAN FARM FINANCE, 1971 & 1975




## FIGURE 5.7 CANADIAN FARM LABOR SUPPLY, 1975




M – million

credit. Because farms in Canada are traditionally owner-operated, by far the largest part of the total capital is still provided by farmers' themselves, through savings. But refinancing the farm each generation means that farmers are forced to save at a high rate, and the trend today in commercial farming is to borrow an increasing proportion of the total capital requirements.

Farm credit is commonly classified into three types by length of term: long, intermediate and short. Long-term credit, normally ten years or more, is used primarily for real estate financing. Intermediate-term credit (1 1/2 to 10 years) is used for livestock, equipment and improvements, and short-term credit is mainly operating credit.

Long-term credit has ranged from about 8 percent of total credit in 1971, a year of generally poor farm economic conditions, to 17 percent in 1966, a good year. But in 1975, also a good year generally from the standpoint of farm income, long-term credit amounted to only 12 percent of the total. There has been considerably less variation in the percentages for short and intermediate credit. It would seem that farmers adjust their long-term borrowings to prevailing or cyclical economic conditions. Also, credit needs appear to be met to a greater extent with short-term borrowings in low- income years. The trends since 1961 in amounts of the various types of credit extended are shown in Table 5.9.

The development of the types and amounts of credit outlined above has been in response to farmers' perceived needs. A reasonably stable supply of credit is required. There are occasions when farmers can advantageously acquire land, make building or land improvements and buy equipment, livestock and supplies, and it is important that they have access to credit at such times. Attempts to provide credit at low rates of interest have sometimes interfered with an adequate money supply, and a balance between supply and rates of interest is needed. Farm credit programs need to take into account the variability of farm incomes, e.g. farm business may be in temporary difficulty, but at the same time have sound business prospects in the longer run. The granting of credit requires a capacity for accurate assessment of the development plans of farmers and potential farmers.

### 5.7.2 Role of Banks and Other Private Agencies

Banks have been traditionally the main source of short and intermediate-term credit for farmers. In recent years, by far the largest part has been short-term. In 1960, banks had about $420 million in farm credit outstanding, by 1975, this had increased by more than six times to $2.7 billion. One-third of all farm debt in 1975 was owed to banks, and it is thought that nearly three-quarters of this is short-term credit. Banks in the farm lending field handle a large volume of funds and

show an increasing capability and interest in agriculture. In 1975, at least $750 million of the farm credit outstanding on farm accounts of banks were under federal or provincial guarantees. The amount of credit supplied by banks without guarantee, for over five years in term, is unknown but is believed to be relatively small.

Credit unions or caisses populaires serve farmers in all provinces and are frequently very active in areas no longer served by banks. Loans to farmers by these institutions are by far the largest in Saskatchewan, followed by Quebec. Farm indebtedness to credit unions increased from $50 million in 1960 to $722 million in 1975. Credit unions utilize local offices, boards and committees, and emphasize a personal knowledge of loan applicants by credit union officers.

Insurance, trust and loan companies have not shown much interest in farm lending since the difficult experiences of the 1930's. In 1960, these agencies had farm loans amounting to about $16 million. These increased to about $70 million in the late 1960's and, by 1976, there were indications that farm credit from such sources would decline in future years.

The Federal Business Development Bank (formerly Industrial Development Bank) makes loans to farmers and is considered to be a bank of last resort. Lending to farmers in 1963 amounted to $8 million and by 1975, had increased to $28 million, when the outstanding debt of farmers was $84 million. Credit from this source is intermediate-term but is usually for only two or three years.

### 5.7.3 Role of Government Agencies

As in agricultural programs generally, governments have kept credit programs under continuing review and have acted to ensure that perceived farm credit requirements were being met. It has been primarily long-term credit needs, which have not been provided by the private sector, and it is in this area that governments have been most active. When private institutions vacated the field in the 1930's, federal government activities increased with the establishment of the Canadian Farm Loan Board, now the Farm Credit Corporation (FCC). This type of lending received a strong impetus with the Farm Credit Act of 1959, which set up the FCC, and operations under this Act now provide most of the long-term credit for farmers. After the second World War, the Veterans' Land Act also provided a large volume of long-term credit for the establishment of veterans on farms.

Several provincial governments have played a prominent role in supplying long-term credit at different times. Quebec, in particular, has been consistently active for a long period of time. In more recent years, some provincial governments have implemented land banking arrangements whereby farmers could lease land and thus reduce capital and credit requirements.

In the field of intermediate-term credit, the role of governments has been more to encourage the private sector. The most important activity has been the loan guarantee to banks under the Farm Improvement Loans Act, administered by the Department of Finance. Several provincial governments have similar legislation, and in addition, have instituted shorter-term programs to promote development of particular sectors of agriculture. For example, there have been provincial credit programs to promote the production of beef, hogs and milk.

Governments have not assumed a significant role in the provision of short-term credit since such credit has been adequately provided by the private sector, primarily by banks, but also by farm supply companies, equipment dealers and credit unions.

It is estimated that, in 1975, the FCC had outstanding about 24 percent of all farm credit, i.e., about 70 percent of all long-term credit of farmers. The next most important source of long-term credit is the provincial agencies with about eight percent of all credit (mostly long-term). Banks had outstanding about a third of all credit, predominantly short-term.

### 5.7.4 Apparent Problems

Rapidly escalating farm land values, aggravated by competing uses for land, together with the commercialization of farming, have greatly increased requirements for long-term credit. In most years, the federal government, through the FCC has met the demand. Occasionally, as in 1976-77, the borrowing authority of the Corporation from the Government was reduced somewhat at a time when the demand for loans appeared to be strong. However, as it turned out, there was a decline in demand and the loan funds available were adequate. There is the longer term problem, however, of whether or not the federal government considers it can continue to meet such a large proportion of the long-term credit needs of one sector of society.

There is the associated question of determining the sector of agriculture to which the credit should go. Generally FCC funds go to family type farms which have reasonable prospects of becoming or remaining viable units. Larger farms which have alternative sources of funds do not qualify for FCC loans. If FCC funds are further restricted, the problem of finding a means of filling the gap will become more acute.

Some provinces consider that the capital and credit requirements of farmers can be reduced by the government purchasing land and leasing it to individuals, normally at a rate lower than cost. This means not only a different approach according to regions but another possible element of inequity in inter-regional competition.

Both agricultural and non-agricultural competition for the limited supply of agricultural land has raised questions as to whether or not some sort of zoning for agriculture may be desirable. British Columbia introduced such a measure and although land values have continued to increase, it may help to retain more land in farming. As the pressure on farm land increases, the question as to the guides or controls required in the use of such land will assume greater importance. This issue falls mainly within provincial jurisdiction.

Finally, there is an apparent problem relating to the coordination of the various activities in the field of credit. Different programs are available in various provinces, such that farmers in one province have advantages not available in another. A large number of programs are in operation and it would seem that more consistency in credit programs from one region or province to another would be desirable for a healthy agriculture.

Table 5.8 FARM ASSETS AND DEBTS, CANADA, SELECTED YEARS, 1951 to 1975

| | | 1951 | 1961 | 1971 | 1975P |
|---|---|---|---|---|---|
| Farm assets[a] | $mil. | 9,471 | 13,171 | 23,886 | 42,531 |
| Debts | $mil. | 843 | 1,785 | 4,714 | 8,119 |
| Debts as Percent Of Assets | (%) | 8.9 | 13.6 | 19.7 | 19.1 |

[a]Real estate, livestock and equipment.
Ppreliminary

Source: For 1951, Lerohl, M.L., Assets, Liabilities and Net Worth of Canadian Farm Operators, 1935-64, Agricultural economics Research Council of Canada, March 1967. For other years, Rust, R.S., Canadian Farm Economics, various issues.

Table 5.9 FARM CREDIT EXTENDED, CANADA, SELECTED YEARS, 1961 to 1975

| Year | Long-Term | Intermediate Term | Short-Term | Total | Percent of Farm Assets[a] |
|---|---|---|---|---|---|
| | | - $ million - | | | % |
| 1961 | 138.2 | 231.9 | 779.5 | 1,149.6 | 8.7 |
| 1966 | 344.2 | 476.4 | 1,201.1 | 2,021.7 | 10.6 |
| 1971 | 206.0 | 528.4 | 1,906.3 | 2,640.7 | 11.1 |
| 1975p | 654.4 | 1,199.1 | 3,559.9 | 5,413.4 | 12.7 |

[a]Real estate, livestock and equipment.
[p]preliminary

Source: Rust R.S., Canadian Farm Economics, various issues.

## 5.8 FARM LABOR

In 1975, Canadian farming employed 479,000 workers, or five percent of total Canadian employment. In 1950, agriculture employed 18 percent of all workers, or over 900,000 persons. Paid employment in farming has been relatively constant in the review period but has doubled in importance relative to the total agricultural labor force. Wages paid to hired farm workers in 1975 cost farmers $506 million or nine percent of farm operating expenses. While wages paid in 1950 were lower at $146 million, they represented 13 percent of total farm operating costs. Thus, there has been a large decline in the total labor input in farming in the review period but this has been offset by an increase in the capital input.

The factors determining the demand for labor are difficult to separate from supply factors because of interactions with other sectors of the economy and because self-employment still provides a large part of the farm labor supply. Non-farm wage rates generally seem to determine the level of wages paid to hired farm labor but the supply of labor is affected also by the national unemployment rate. During periods of high national unemployment, the unpaid family labor component of the farm labor force tends to increase. Improved farm incomes, or the prospects of them, are one of the most important generators of demand for farm workers of all classes. In periods of rising farm incomes, the migration of labor out of farming usually slows down and there may even be a net increase in total employment as happened apparently in 1974 and 1975 (Figure 5.7).

### 5.8.1 Size and Sources of the Labor Force

In 1975, 270,000 farm operators, 109,000 hired workers, and 100,000 unpaid family workers were employed in agriculture for

a total labor force of 479,000 persons. The number of hired workers employed annually has remained close to 100,000 for 25 years (Table 5.10). However, because the number of farm operators and unpaid family workers decreased by 326,000 and 143,000 persons, respectively, from 1951 to 1975, hired labor now represents 23 percent of total farm employment, compared to 11 percent in 1951. An estimated 70 percent of this hired labor is employed on a full-time basis.

The average farm wage rate increased four fold during the 1951-75 period which raised the total farm wage bill from $161 million to $506 million. Conversely, the wage bill as a percent of total operating expenses has been decreasing due to the increased use of other farm inputs. Wages represented less than 10 percent of farm operating expenses in 1975 (Table 5.10).

Fewer than half of all farms in Canada used hired labor in 1971 and less than 10 percent reported employment on a full-time basis (Table 5.11). Large farms typically employ most of the hired labor, while small farms depend extensively on unpaid family help. Although many farms can manage with few or no paid workers, some need extra labor, especially on a seasonal basis, but cannot afford to pay the going wage rate. Others, willing to pay, have frequently been unable to find qualified workers.

### 5.8.2 Competition with Other Industry

Reports of farm labor shortages increased in the late 1960's and early 1970's; especially for full-time labor for livestock enterprises, experienced seasonal labor for grain farms, and casual workers for the fruit, vegetable, and tobacco harvests. However, the situation was eased in 1974 and 1975 by relatively high rates of national unemployment. Unable to find work in other industries, some former farm family workers moved back to the farm and urban workers were more willing to accept farm employment. But, when non-farm employment becomes more readily available again, the supply of labor to agriculture can be expected to decrease.

Competition with other industry for workers is intensified in the summer months because of the seasonal nature of total employment in Canada, dictated by the severe winters. Farm operators require seasonal and peak-period labor at the same time as some non-agricultural industries increase their demands for labor (such as oil exploration in Alberta and hydro construction in Manitoba). To many seasonal workers, non-agricultural employment is preferred because of higher wage rates and, in general, a longer period of employment. Moreover, since seasonal farm labor has to find winter work in other industries, there is a steady loss of such labor from agriculture.

Students who supply a major portion of seasonal farm labor present special problems because they are unable to leave

school soon enough for early field work and must return to school before the end of the harvest season. Some provincial agricultural labor advisers believe that if schools were to continue operations until the end of July and open one month later in the fall, both farmers and students would benefit.

### 5.8.3 Apparent Problems

Farm wage rates, in absolute terms and relative to non-farm occupations, are a significant deterrent to farm employment (Table 5.12). Moreover, the complexity of modern mechanized farming has increased the need for skilled labor, for which farm operators must compete directly with other sectors of the economy.

Working conditions and the lack of fringe benefits associated with farm employment appear to be as much a problem as lower wages, especially for full-time hired labor. The eight-hour day and the five-day week of industry are uncommon in agriculture while fringe benefits such as pension plans, disability insurance, and vacation pay are seldom available. In addition, the schools, medical facilities, and entertainment services near isolated farm communities are often inferior to those located in urban centres. On the other hand, increasing pollution and urban congestion may encourage more people to seek rural employment.

Some farm operators have recognized the problems mentioned above and are now offering wages, working conditions, and fringe benefits that are more equitable with those found in other sectors. Government involvement in recruitment and training has also made a significant contribution to the reduction of farm labor shortages.

### 5.8.4 Possible Solutions

The Local Agricultural Manpower Boards (LAMBs), which establish guidelines for farm wage rates, working conditions, and accommodation, generally consist of farmer and government representatives. The LAMBs likely would function more effectively if farm labor representation also existed on each board.

There is a growing need for an improvement in the standards for labor employed in agriculture. These must suit the special needs of agriculture and cover such things as wage protection, conditions of work, and termination of employment. In addition, training courses and extension work to improve the labor management skills of farm operators are required.

While there is presently no indication that the government-sponsored foreign-worker programs will be discontinued or reduced, dependence on such programs should be minimized and every effort made to fully utilize the Canadian labor supply.

Finally, a number of farm labor studies would be beneficial for policy and program development if the present lack of data can be overcome. Manpower and immigration, Statistics Canada, and Agriculture Canada are working together currently to improve the situation. Research on the demand and supply of hired farm labor by skills, length of employment, and time of employment would be of value. Knowledge of the structure of the farm labor force needs to be increased. Alternative training and recruitment strategies could be investigated once specific labor problems are identified. Perhaps of most value would be research on the extent to which the shortage of farm labor may be restricting farm growth and causing over-capitalization of farms in Canada.

Table 5.10 FARM LABOR STATISTICS FOR CANADA, SELECTED YEARS, 1951 to 1975

| Year | Number of Hired Workers | Hired Farm Labor Price Index | Wages to Farm Labor | Wages as a % of Total Operating Expenses |
|---|---|---|---|---|
| | (000) | (1961=100) | ($ million) | (%) |
| 1951 | 100 | 73.6 | 160.5 | 13.2 |
| 1956 | 103 | 83.1 | 182.0 | 12.8 |
| 1961 | 112 | 100.0 | 230.2 | 13.6 |
| 1966 | 98 | 131.8 | 246.9 | 10.0 |
| 1971 | 102 | 178.2 | 306.8 | 10.3 |
| 1975 | 109 | 252.0 | 506.1 | 9.1 |

Sources: Statistics Canada, Cat. 21-202, 62-004 and 71-001.

Table 5.11 USE OF HIRED LABOR ON CANADIAN FARMS BY REGION, 1971

| Region | Farms Reporting Paid Labor | Farms With Sales of $2,500-9,999 Reporting Paid Labor | Farms With Sales of more than $10,000 Reporting Paid Labor | Farms Reporting Year-round Labor |
|---|---|---|---|---|
| | - percent of all census farms - | | | |
| British Columbia | 40 | 51 | 74 | 8 |
| Prairie Region | 33 | 28 | 56 | 4 |
| Ontario | 38 | 34 | 61 | 7 |
| Quebec | 34 | 34 | 58 | 6 |
| Maritime Region | 41 | 51 | 80 | 8 |

Source: Statistics Canada, Census of Canada, 1971.

Table 5.12 AVERAGE HOURLY EARNINGS BY INDUSTRY, CANADA, SELECTED YEARS, 1951 to 1975

| Year | Agriculture (without board) | Mining | Manufacturing | Construction |
|---|---|---|---|---|
| | | - dollars - | | |
| 1951 | n.a. | 1.35 | 1.18 | 1.19 |
| 1956 | .86 | 1.73 | 1.52 | 1.65 |
| 1961 | 1.02 | 2.13 | 1.83 | 2.06 |
| 1966 | 1.24 | 2.60 | 2.25 | 2.80 |
| 1971 | 1.64 | 4.04 | 3.28 | 4.75 |
| 1975 | 2.84 | 6.51 | 5.06 | 7.51 |

n.a. = not available

Source: Statistics Canada, Cat. 72-202.

## 6. THE AGRICULTURE AND FOOD MARKETING SYSTEM - HIGHLIGHTS

1975

1. Since 1950, there has been an overall increase in numbers of marketing boards and cooperatives throughout Canada with producers increasing their control over marketing. Products under marketing board jurisdiction alone account for nearly 60 percent of farm cash receipts.

2. Vertical integration within the agricultural marketing system is increasing. This is especially true in regards to the retailer-wholesaler connections.

3. Government involvement in the marketplace has been continuously increasing. It has taken the form of health and quality standards, of efforts to stabilize farm incomes, of trade policies and of concern over consumer welfare.

4. Among secondary Canadian industries, food and beverage manufacturing is the largest, employs the most people, spends most on materials and supplies and produces the largest total value added. Over the period 1961-74, the value added by this industry has increased in real terms by 32 percent; this has resulted in an increasing market share of the cost of food, which is currently at approximately 65 percent.

5. The number of food processing plants has been decreasing but is expected to stabilize around 4,000 units by 1980. The total value of food processing factory sales rose to $14.7 billion in 1974. The export market accounts for ten percent of this, while 20 percent of domestic shipments go to institutions and 80 percent to retail markets.

6. Chain stores as well as other convenience stores have increased not only in number to 3221, but they have also increased their effective control of the market to about 60 percent.

7. The hotel, restaurant and institutional trade is a market for an ever increasing share of agricultural production with estimated sales of $4.3 billion.

# 6. THE AGRICULTURE AND FOOD MARKETING SYSTEM

## 6.1 INTRODUCTION

The marketing system usually refers to the commercial and productive activities associated with commodities from the farm gate to the ultimate user. These include the exchange functions of buying and selling, the physical functions of processing, transportation and storage, and several facilitating functions, such as standardization, financing, risk bearing and market intelligence. For some products, farmers conduct some or all of these marketing functions.

The Canadian farm product marketing system reflects the diversity of the country's geography and is partly shaped by the relative bargaining strengths of its participants. An overview of this system (Figure 6.1) shows that there are many types of marketing channels, or ways in which the individual institutions and business organizations who participate in the marketing process are arranged. Table 6.1 outlines the approximate volumes of selected commodities which flow through these marketing channels. In many cases, figures are estimates only, and for some channels data is not available.

Measured by the number of decision-making levels between producer and consumer, the complexity of the Canadian farm product marketing system is lessening. Factors contributing to the rationalization of the marketing system include farmers' ability to interrelate production and marketing functions, the degree of increasing forward or backward vertical integration and the overall efficiency of the marketing process.

From 1961 to 1971, the marketing share of the retail food dollar increased from 58 to 64 percent. This trend was reversed for a short time in the early 1970's due to a rapid rise in many farm prices. The factors which have contributed to decreasing the farm share are:

(1) agricultural productivity growth which has reduced costs per unit of output at the farm level;

(2) the increased amount of services, eg., packaging, quality control and a greater variety;

(3) now a greater dependence upon hotel, restaurant and institution preparation of food rather than home preparation;

(4) increase in the amount snack and gourmet foods have become popular, and a general consumer orientation towards higher price-per-unit foods;

(5) government regulations for better consumer protection, better labelling, packaging, etc., the cost of which is passed onto the consumer as part of the market share;

(6) the increase in imports, which usually command a higher

FIGURE 6.1 **THE CANADIAN AGRICULTURE & FOOD MARKETING SYSTEM, 1976**

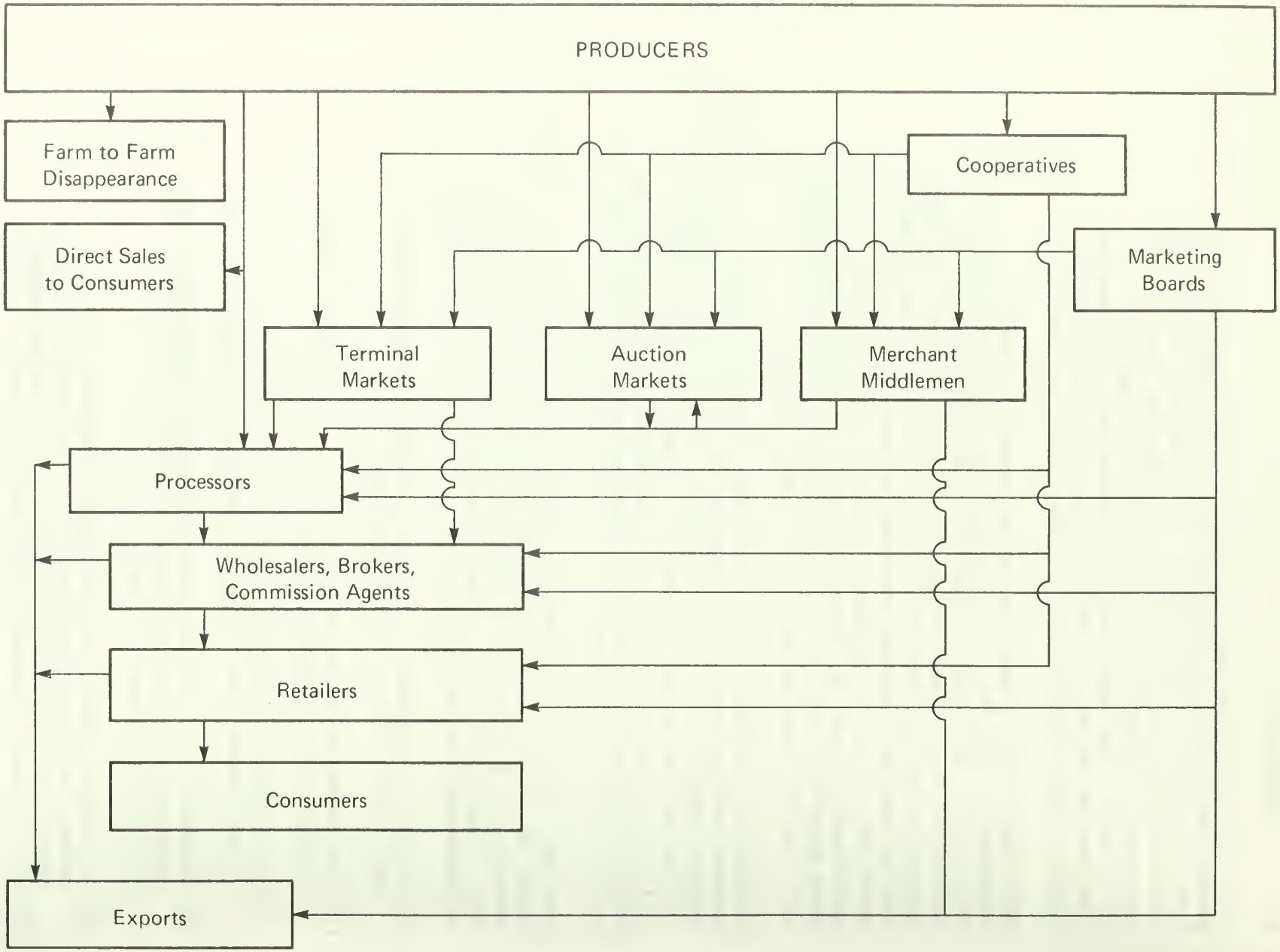


Table 6.1 FARM CASH RECEIPTS FROM MAJOR COMMODITIES BY SALES METHOD, CANADA, 1976[a]

| | Direct Sales | Collective Sales: Boards | Collective Sales: Coop | Collective Sales: Integration | Public Auction | Public Treaty[c]: Contracting | Public Treaty[c]: On the Spot Sales[d] | Totals |
|---|---|---|---|---|---|---|---|---|
| | | | | - $000 - | | | | |
| Grains | - | 1,590,251 | - | - | - | - | 978,541 | 2,568,792 |
| Oilseeds | - | 77,221 | - | - | - | 66,189 | 408,168 | 551,578 |
| Sugar Beets | - | - | - | - | - | 43,799 | - | 43,799 |
| Tobacco | - | 207,681 | - | - | - | - | - | 207,681 |
| Potatoes | 5,645 | 36,774 | - | - | - | 85,827 | 85,700 | 213,946 |
| Other Crops | - | - | - | - | - | 69,182 | 69,182 | 207,545 |
| Cattle | - | - | - | - | 692,746 | 100,000[b] | 746,689[b] | 1,539,435 |
| Calves | - | - | - | - | 141,146 | - | - | 141,146 |
| Hogs | - | 527,776 | - | 141,791 | - | - | 118,159 | 787,726 |
| Sheep & Lambs | 3,860 | - | 2,187 | - | - | - | 6,820 | 12,867 |
| Dairy Produce | 141,406 | 946,338 | - | - | - | - | - | 1,087,744 |
| Polutry | 14,164 | 391,884 | - | - | - | - | 66,102[e] | 472,155 |
| Eggs | 32,291 | 199,130 | - | - | - | - | 37,674[e] | 26,909 |
| Other Livestock | 19,461 | - | 19,461 | - | - | 19,461 | 19,461 | 77,844 |
| Forest-Maple | 4,915 | 24,351 | 6,004 | - | - | 5,683 | - | 40,959 |
| Fruits | 24,822 | 140,656 | - | - | - | - | - | 165,478 |
| Vegetables | 12,457 | 65,158 | - | - | - | 26,830 | 87,198 | 191,643 |
| Totals | 259,021 | 4,276,407 | 27,652 | 141,791 | 833,892 | 416,971 | 2,623,694 | 8,579,428 |
| % by marketing method | 3 | 50 | - | 2 | 10 | 5 | 30 | 100 |

[a]Figures in this table are relative weights from which the percentages in the bottom row were calculated. The weights themselves are portions of farm cash receipts calculated by estimating the physical volumes of each commodity group that leave the farm through the various marketing channels.

[b]Estimates

[c]Roadside stalls, farmers' markets, informal. In this table, direct sales means that consumers buy from farmers, and private treaty means that farmers negotiate directly with non-consuming buyers without the intermediation of any influencing agency such as a marketing board or auctioneer. In section 6.2.4, direct sales and private treaty are equated.

[d]Estimates because there are no public records.

[e]This is an estimated share of poultry and eggs that escape board scrutiny and control, sold directly to jobbers, wholesalers and processors; divided arbitarily among those mechanisms that are known to be used.

Source: Production and Marketing Branch, Agriculture Canada.

market share than do domestically-produced commodities because of higher transport and merchandising costs.

The following sections described the marketing channels for primary Canadian agricultural products, including the role of government.

## 6.2 PRODUCER SALES

### 6.2.1 Direct Farmer - Buyer

There are three types of direct sales: farm-to-farm, farm-to-consumer and farm-to-processor.

Farm-to-farm sales include pigs and calves for feeding, and breeding, seeds and feed grains. Feed grain and seed account for 58 percent of the total grain production, and of this, 40 percent mis sold farm-to-farm. Forage crops, which are nearly all utilized on the farm, account for 20 percent of the total cultivated land each year. Such sales are not shown in farm cash receipts to avoid double counting.

Farm-to-consumer sales mechanisms include roadside stands, farmer's markets, 'pick-your own' and door-to-door sales. With the exception of farmers' markets, where facilities and regulations concerning their use is a municipal concern, there is no 'third party' and the price and allocation of functions are a matter of negotiation. Direct sales of tender fruit are increasing and farmers' markets offering a wide range of horticultural, dairy and poultry products seem to be reviving.

Direct farm-to-processor sales are of some significance for feed grains, oilseeds, beef, hogs (in Quebec), potatoes (in the Maritimes), fruits and vegetables. The major advantage of this type of sale is the reduction in physical losses due to handling and lower marketing charges. There is, in some cases, an increased coordination between the producer's actions and the processor's needs. The major disadvantages are associated with imperfect market information and decreased producer bargaining power.

Although most producer-processor sales may be on a spot basis, some form of contract is also common in order to improve the level of coordination. Types of contracts include market-specification, production-management and resource contracting. The range of possible allocations of marketing functions between producer and processor depends upon the characteristics of the commodity marketing problem (e.g., quality control, stability of supply and price, technological or capital needs). Hedging on futures markets is sometimes used to reduce price risks. Prices may be tied to an agreed open market price or they may be adjusted in light of the producer's willingness to assume some market functions himself. Some provincial governments provide arbitration services to help settle contract disputes. In the case of most fruits and vegetables

for processing, marketing boards negotiate prices while the producer-processor negotiations determine the quantities, timing, etc. Vertical integration, either processors buying production units or cooperatives buying processing plants, is increasingly important.

Direct producer-processor sales account for 55 percent of all beef slaughter animals and this figure is increasing. For other commodities, channels other than producer-processor sales seem to be increasingly popular.

### 6.2.2 Public Exchange

Public exchanges provide physical facilities for marketing, set hours of trading and terms of sale but do not participate directly. Auction and terminal markets are examples.

#### Terminal Markets

An appreciable but declining number of cattle, some other livestock, and fruits and vegetables are sold in major cities at centralized locations called terminal markets. A farmer ships his products by rail or truck to a commission agent of his choice who sells at the market on his behalf to packers, wholesalers or retailers. Livestock are sold at terminals primarily by auction, and fruits and vegetables by negotiation. The terminal market facilities are owned and operated by the provincial governments in some cases and in others by private interests.

In the case of the eight livestock terminal markets, the federal government provides services such as bonding, supervision of selling practices, health inspection, weighing and price reporting. A corresponding set of services are provided for the fruit and vegetable markets. The use of terminal markets for livestock sales has decreased however, because of the relatively high cost of this method of marketing, the shift of slaughter plants to livestock production areas, and, in the case of hogs, the introduction of teletype selling by the marketing board in Ontario. Fruit and vegetable terminals have not declined to the same degree but the growth of chain retail stores and improved truck transportation are factors which have encouraged the by-passing of these markets by significant volumes of production.

#### Auction Markets

Local auction markets have long been a major selling mechanism for livestock, especially for feeder animals. These markets are owned and operated by private interests. Provincial government services are provided to varying degrees. The auctions sell directly on behalf of the farmer. The buyers include other farmers, dealers (who will in turn sell to packers or again put them through an auction), packers, and local butchers. The major problem facing many auctions is

attracting sufficient buyers to provide a competitive market. Some auctions operate only on a part-time basis.

### 6.2.3 Collective Marketing Mechanisms

#### Cooperatives

The cooperative form of organization allows farmers to participate directly in the wholesaling and processing of their products. Many cooperatives act as an assembly mechanism for a marketing board which carries out the marketing functions, distributing the profits back to the cooperatives. These are voluntary and often have to compete with private firms on the open market, while boards are compulsory and can obtain the necessary legal regulations necessary to control the marketing of all production in the province in which they operate. Both can act as individual businesses within the marketing system and can perform all functions and utilize all channels or institutions in the same way as an individual can. In a few cases, they regulate production levels and/or allocate available supplies among buyers. The four major grain cooperatives (Alberta Wheat Pool, Saskatchewan Wheat Pool, Manitoba Pool Elevators and United Grain Growers) handle 80 percent of Canada's cash grain crop. In 1974, they had 208,000 members, assests of $1.0 billion and net sales of $54.5 million Cooperatives handle a major share of the milk in all provinces, about half the livestock on public markets and a significant share of poultry processing and marketing. Five regional cooperatives (which include local cooperatives as members) are important not only in food wholesaling, processing and retailing but also in farm input production and distribution, e.g., feed, fertilizer, petroleum and lumber.

#### Marketing Boards

Marketing boards except for the Canadian Wheat Board (CWB) are producer-controlled and all production within their geographic jurisdiction must be marketed through them. All boards, except the CWB, are provincial in scope and operate under provincial legislation with some delegated federal powers. The CWB is responsible to the federal government rather than to producers. At the national level, the Canadian Egg Marketing Agency and Canadian Turkey Marketing Agency coordinate the activities of their respective provincial boards in order to operate a national supply management program. Also, the Canadian Dairy Commission (CDC) works closely with provincial milk marketing boards and uses its subsidy program to control industrial milk kproduction. The provincial boards have directors elected by farmers whereas the directors of the national egg and turkey agencies are appointed in part by the provincial boards and in part by the federal government. The Commissioners of the CWB are appointed by the federal government with an advisory committee of eleven members by producers. The commissioners of the CDC are appointed by the government. The egg and turkey agencies are supervised by the Canadian Farm Products Marketing

Council under the National Farm Products Marketing Agencies Act.

Provincial marketing boards administer marketing plans and have wide powers to regulate production, distribution and marketing practices, including, directly or indirectly, prices and to make producer levies for specific purposes. Few, if any, boards employ all of these powers but a wide variety of activities are conducted. These include supply management, price negotiations with processors on behalf of producers, operation of marketing facilities and domestic and export market development.

The coverage of marketing boards in terms of products, producers and cash receipts is indicated in Tables 6.2 and 6.3. However, these tables do not reflect the impact on farmers, consumers or the system as a whole because they do not indicate the powers exercised.

### 6.2.4 Other Marketing Mechanisms

#### Merchant Middlemen

Merchant middlemen include all retailers and wholesalers who take title to the goods they handle. Examples of merchant middlemen are the following:

(1) Grain Elevators. Off-board feed grains in the prairies and all grains outside the Canadian Wheat Board (CWB) designated area are sold to local elevators who act as merchant middlemen. They operate on a spot market basis, with the price usually based on the futures market. (Until recently, a 'street price committee' performed this pricing function in the prairies). The elevators provide cleaning, grading and storage service and, in the case of corn, some provide drying facilities. Feed grains are sold to local farmers, shipped to other regions or to export markets, or processed into feed and sold back to farmers. Most elevators are owned and operated either by the large international grain companies or by producer cooperatives or boards. The Canadian Grain Commission supervises the operations of terminal elevators and of country elevators into CWB designated areas, and sets maximum charges for their services. Elevators in Ontario act as agents of the Ontario Wheat Producers' Marketing Board in that the latter takes ownership of the grain upon delivery.

Within the CWB area, elevators act as agents of the Board in buying, storing and shipping all wheat, oats and barley for export. The initial prices of the base grades are established by the federal government. The Board dicounts the initial prices of other grades from the base grade. Initial prices are set basis Thunder Bay or Vancouver, and freight and handling charges are deducted to determine the price to the farmer at any point. The surplus from sales revenue less marketing and board administration costs is distributed to producers through

Table 6.2 PRODUCERS' RECEIPTS THROUGH MARKETING BOARDS' BY COMMODITY, CANADA, 1974/75 AND 1975/76

| Commodity | 1974/75[a] Farm Cash Receipts | 1974/75[a] Producers Receipts through Marketing Boards | | 1975/76 Farm Cash Receipts | 1975/76 Producers Receipts through Marketing Boards | |
|---|---|---|---|---|---|---|
| | $000 | $000 | % | $000 | $000 | % |
| Grains[b] | 2,554,405 | 2,226,211 | 87 | 3,343,428 | 2,994,866 | 90 |
| Oilseeds | 551,842 | 57,723 | 10 | 384,627 | 69,600 | 18 |
| Cattle and calves | 140,232 | 73,146 | 52 | 126,856 | 71,457 | 56 |
| Hogs | 403,152 | 96,868 | 24 | 348,278 | 114,152 | 33 |
| Dairy products[c] | 1,677,340 | nil | nil | 1,817,975 | nil | nil |
| Poultry | 778,092 | 524,779 | 67 | 886,471 | 583,363 | 66 |
| Eggs[d] | 1,316,962 | 1,301,040 | 99 | 1,608,181 | 1,608,181 | 100 |
| Fruits | 472,150 | 384,082 | 81 | 412,532 | 372,123 | 90 |
| Vegetables[e] | 269,095 | 197,858 | 74 | 258,358 | 197,879 | 77 |
| Others | 715,430 | 323,180 | 45 | 720,625 | 299,752 | 40 |
| Total | 8,878,700 | 5,184,887 | 58 | 9,907,331 | 6,302,373 | 64 |

[a]Revised.
[b]Includes wheat, oats, barley, rye, corn, and Canadian Wheat Board payments, cash advances and differred grain receipts.
[c]Includes dairy supplementary payments.
[d]Newfoundland not included.
[e]Includes potatoes.

Source: Agriculture Canada, Marketing Board Statistics, 1976 and 1977.

Table 6.3 PRODUCTS UNDER MARKETING BOARD JURISDICTION AND SELECTED STATISTICS, BY PROVINCE, CANADA, 1976[a]

| Province | Products | Number of Boards | Number of Producers[b] | Percentage of Farm Cash Receipts[c] |
|---|---|---|---|---|
| British Columbia | Grains, dairy, broilers turkeys, eggs, fruits, potatoes and other vegetables | 10 | 5,111 | 59 |
| Alberta | Grains, hogs, sheep and wool, dairy, broilers, turkeys, eggs and fowl, potatoes and other vegetables | 7 | 32,331 | 46 |
| Saskatchewan | Grains, hogs, eggs, dairy broilers, turkeys | 6 | 20,298 | 69 |
| Manitoba | Grains, hogs dairy, broilers, turkeys, eggs, vegetables | 9 | 11,524 | 54 |
| Ontario | Winter wheat, seed corn, soybeans, hogs, dairy, broilers, turkeys, egg, beans fruits, vegetables, tobacco | 21 | 86,255 | 57 |
| Quebec | Dairy, broilers, turkeys, eggs,blueberries, tomatoes, pulpwood, maple products | 24 | 54,353 | 54 |
| New Brunswick | Hogs, dairy, broilers, turkeys, eggs, apples, beeding plants, pulpwood | 10 | 9,747 | 40 |
| Nova Scotia | Hog, dairy, broilers, | 7 | 2,245 | 62 |
| Prince Edward Island | Hogs, dairy, broilers, eggs, potatoes and other vegetables, tobacco | 6 | 3,222 | 36 |
| Newfoundland | Eggs | 1 | 40 | |
| Canadian Wheat Board | | 1 | 150.708 | |
| Total | | 105 | 384,834 | 57[d] |

[a]Excludes a sheep and wool board in Saskatchewan and a cole crop board in P.E.I. which began operations during the year, and four inactive boards (honey in Saskatchewan and Manitoba, and onions and sugar beets in Ontario).

[b]Some double counting occurs as a number of producers may be members of more than one board. Producer figures are not included for inactive boards nor for those new boards that had not yet completed a full year's operations.

[c]Receipts for some boards are for the 1974-75 crop year. Receipts from the Canadian Wheat Board are allocated among provinces. Receipts under the Canadian Egg Marketing Agency and Canadian Turkey Marketing Agency are reported under the relevant provincial boards.

[d]Excludes Newfoundland.

Source: Agriculture Canada, Marketing Board Statistics, 1977.

a final payment. The quantities marketed by each producer are regulated by the Board through a system of delivery quotas. The Board also has the power to allocate elevator space to specific grains and to allocate railcars. Wheat sales in Ontario recently have come under the control of the Ontario Wheat Producers' Marketing Board.

(2) Egg Grading Stations. Traditionally, farmers sold their eggs to local egg grading stations which established the local price, washed, graded and packaged the eggs, and shipped them to urban wholesalers or large retailers. More recently, provincial egg marketing boards and the Canadian Egg Marketing Agency have regulated production and prices, including the diversion of table eggs to the processing market.

(3) Dealers. Livestock dealers buy from farmers or at auctions and sell to other farmers at auctions or to packers. Other commodities are also served by dealers. Dealers who buy from the farm minimize marketing costs per se for the farmer, sometimes providing the only market outlet and often providing a useful assembly and arbitrage function (e.g., in veal calf marketing).

### Agent Middlemen

This group does not take title to goods. Their income is derived from fees and commissions charged for providing market information and for their ability to get buyers and sellers together. The agent middlemen who are located in the urban areas play a similar role in the marketing of primary farm products as those noted in the section on terminal markets. Commission firms located in farm production areas are also important, especially for fruits and vegetables, although marketing boards have diminished this role except in the Maritimes. The local firm finds the most profitable market or customer for the producer, it may or may not also sell a grading and packing service.

### Speculative Middlemen

These middlemen take title to the goods they handle with the objective of profiting from short-term price changes, but not necessarily from the efficient handling and merchandising of the goods.

### Futures Markets

In principle, hedging on futures markets can provide producers, processors, and others in the production and marketing system with an effective method of reducing the risk of loss through commodity price changes. A hedge is made by offsetting the participant's commodity position with a transaction in the futures market. An elevator operator, for example, who buys

current price quote for the month. If market prices in fact fell over the period, the loss he would make on his actual grain inventory would be offset by buying back his futures contract at the lower price. This hedging of prices is effective if spot prices and futures prices move relative to each other as expected. This will generally occur only if enough speculators are present, but it will sometimes occur when one buyer or seller has a particularily strong influence on the market.

Futures contracts are traded in Canada on the Winnipeg Commodity Exchange and are presently operating for feed wheat, oats, barley, rye, flax and rapeseed. Volume is a problem on all the futures markets, and because of this, recent experiments with corn were not sucessful. The problem is associated in part with the dominate role of the CWB in the grain trade and in part with the relatively small Canadian market. United States futures markets (primarily at Chicago) are widely used there and both grain and livestock products may be hedged on these markets.

## Government

The federal government plays a significant role in the farm product marketing system. This role is largely indirect and primarily centers around health protection, quality standards, efforts to stabilize (or increase) farm incomes, trade policy, and consumer welfare. In more general terms, it attempts to provide a more efficient and equitable system. Some activities are carried out by government departments, others by their more or less independent agencies or commissions. A few examples of the federal government's activities are:

- the establishment and enforcement of quality grades;
- the establishment and enforcement of regulations concerning the purity of all raw and processed products in terms of contamination or disease including the health of animals and sanitation of processing facilities;
- western grain and agricultural stabilization programs;
- guaranteed initial payments to grain producers;
- market development services and grants, domestic and export;
- tariff policy;
- the two-price system for wheat, and other consumer subsidies;
- enabling legislation for national marketing boards and delegation of power to provincial boards;
- transportation policy, including the Crows Nest Pass legislation and the activities of the CWB and Canadian Livestock Feed Board;
- information collection and dissemination, including market data and market analysis and outlook work;
- subsidies for construction of processing facilities, storage, etc.
- competition policy, manpower programs, and other broad programs having an impact on the farm marketing system.

Provincial governments also are involved in many of these areas, especially in marketing board legislation and supervision, income stabilization and support, grades and standards, information flows, and market development.

### Other Specialized Services

Various firms and agencies in the farm marketing system supply transportation, storage, financing, etc. internally and also purchase them from specialized firms. The government often plays a key role in these areas through regulations, financing or ownership.

## 6.3 PROCESSORS

In 1974, the food processing subsector employed 230,528 persons, paid $2.0 billion in salaries and wages, purchased $10.4 billion of materials and supplies and produced a gross output of $14.7 billion. Value added amounted to $5.1 billion compared with $5.9 billion value added in the primary sector. Among secondary Canadian industries, food processing is the largest, employs the most people, pays the largest amount in wages and salaries, spends most on materials and supplies, and produces the largest total value added. Within food processing, meat and milk are the leading commodities, with 24 and 16 percent of factory sales respectively.

The food processing subsector employed 330 professionals in research and development in 1974. Participation by the subsector in government-sponsored research incentive programs amounted to a total of about $4.2 million in 1976-77. This amount was four percent of the Program for Advancement of Industrial Technology (PAIT) and 19.6 percent of the Industrial Research Assistance Program (IRAP) funds.

The total value of food processing factory sales in Canada has risen from $3.1 billion in 1952 to $14.7 billion in 1974, an increase of approximately 352 percent. In comparison, during the same period, the value of farm cash receipts rose from $2.8 billion to $8.0 billion, an increase of 218 percent. The rate of increase in factory sales value has been faster than that of farm cash receipts due to the fact that more of the processing is done beyond the farm gate. Approximately ten percent of the factory sales of food processors enter the export market. Domestically, 20 percent of shipments go to institutions and 80 percent to retail markets. It is predicted that the institutional market will equal the retail market by 1980.

The number of food processing plants has been decreasing but is expected to stabilize at approximately 4,000 units by 1980 (Table 6.4). Plants are located close to producing areas to minimize

Table 6.4 NUMBER OF ESTABLISHMENTS IN THE FOOD, BEVERAGE AND TOBACCO PRODUCT INDUSTRIES, BY EMPLOYMENT SIZE RANGE, 1973

| Industry | Employment Size Group | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1-9 | 10-49 | 20-49 | 50-99 | 100-199 | 200-499 | 500-999 | 1000 | TOTAL |
| Slaughtering and proc. | 214 | 152 | 78 | 43 | 31 | 21 | 8 | 4 | 473 |
| Poultry Processors | 13 | 34 | 25 | 22 | 16 | 14 | 1 | - | 100 |
| Fish Products Industry | 113 | 122 | 67 | 31 | 36 | 27 | 2 | 1 | 330 |
| Fruit & Vegetable Canners | 52 | 83 | 38 | 31 | 25 | 12 | 1 | 1 | 205 |
| Frozen Fruit & Vegetable Processors | 7 | 11 | 7 | 10 | 5 | 0 | 0 | 0 | 36 |
| Dairy Products Industry | 225 | 286 | 149 | 65 | 50 | 18 | 1 | 1 | 646 |
| Flour & Breakfast Cereal Prods. Ind. | 12 | 17 | 12 | 8 | 7 | 4 | 1 | - | 49 |
| Feed Industry | 449 | 245 | 87 | 17 | 7 | 1 | - | - | 719 |
| Biscuits Manufacturers | 5 | 7 | 5 | 10 | 7 | 6 | 5 | - | 40 |
| Bakers | 1198 | 391 | 119 | 47 | 32 | 18 | 4 | - | 1690 |
| Confectionery Manufacturers | 52 | 32 | 19 | 4 | 7 | 11 | 5 | 1 | 112 |
| Cane & Beet Sugar Processors | 3 | 2 | 2 | 1 | 3 | 5 | - | - | 14 |
| Vegetable Oil Mills | 1 | 2 | 1 | 4 | 2 | 1 | - | - | 1 |
| Miscellaneous Food Proc. | 85 | 94 | 56 | 43 | 20 | 17 | 3 | - | 262 |
| Soft Drink Manufacturers | 75 | 207 | 125 | 29 | 19 | 6 | 1 | - | 337 |
| Distilleries | 1 | 11 | 8 | 4 | 6 | 7 | 1 | 1 | 31 |
| Breweries | 0 | 7 | 6 | 12 | 10 | 7 | 4 | 2 | 42 |
| Wineries | 9 | 16 | 10 | 6 | 2 | - | - | - | 33 |
| Leaf Tobacco Processors | 1 | 0 | - | 2 | 2 | 3 | - | - | 8 |
| Tobacco Products Man. | 2 | 3 | 3 | 1 | 1 | 5 | 3 | 2 | 17 |

Source: Statistics Canada, Cat. 31-203.

spoilage and transportation costs, except in some sectors of the industry such as beverage, specialty foods and the like, where plants tend to be located closer to the market. About 25 of the leading 200 companies in Canada are primarily in the food business. Of the top seven food companies, five are primarily in beverages and two in meat. In addition to private and publicly-owned companies, several cooperatives process agricultural products.

The average level of concentration in food manufacturing is the same as in all manufacturing: the top four firms average half the value added. Several of the food and beverage industries, however, are highly concentrated at the national level, and concentration at the provincial or regional level is often even higher (Table 6.5). This is an indication of the degree of buyer concentration facing farmers. The four largest slaughtering and meat processing firms at the national level, for example, accounted for 58 percent of the value of factory shipments in 1965, while at the regional level (not necessarily the same), the four largest firms accounted for as much as 85 percent of shipments.

Regionally, Ontario leads in Canadian food processing with 40 percent of the value of shipments in 1974, followed by Quebec, the Prairie Provinces, British Columbia and the Atlantic Provinces with 27, 17, 8 and 8 percent respectively (Table 6.6). In the prairies as well as in the Atlantic Provinces, the food and beverage sector is the leading industry group; in Ontario, it ranks second only to transportation. Finally, in each of Quebec and British Columbia, the food and beverage sector accounts for 16 percent of the total manufacturing production.

Growing pressure from consumers, accelerated growth of imports and increased government regulation are the major forces presently molding the food and beverage industry. Because of its extreme sensitivity to the international food situation, the industry tends to be preoccupied with shorter term problems. On the whole, however, it is agressive and enterprising.

Since its early beginnings, the food processing industry has been decreasing as other industry sectors have been developing. In the past three years, real growth in the food and beverage industry has averaged about 3 percent per annum. Most of this is attributed primarily to healthy growth of distilling, brewing, wine production, feed manufacturing and vegetable oil processing. Very modest real growth (slightly more than 2 percent per annum) has occurred in meat and poultry processing, fruit and vegetable canning and the miscellaneous food categories. Production of breakfast cereals, biscuit bakeries and confectionary has shown zero real growth, while the output of dairy products has declined steadily.

Table 6.5 CONCENTRATION RATIOS FOR FOOD MANUFACTURING INDUSTRIES, CANADA, 1972

| Industry | % of Industry Value of Shipments | |
|---|---|---|
| | Four Leading Enterprises | Eight Leading Enterprises |
| Slaughtering & meat processors | 54.0 | 62.1 |
| Poultry processors | 38.3 | 54.3 |
| Fish products | 42.5 | 54.5 |
| Canners & processers | 39.8 | 55.9 |
| Processers | 60.5 | 78.2 |
| Dairy products | 33.0 | 45.9 |
| Cereal products | 66.8 | 85.4 |
| Biscuit manufactures | 73.4 | 86.8 |
| Bakeries | 33.5 | 47.8 |
| Confectionery manufactures | 49.4 | 70.4 |
| Vegetable ail mills | 75.6 | - |
| Misc. food processors | 35.2 | 51.3 |
| Soft drink manufactures | 46.2 | 55.9 |
| Distilleries | 80.9 | 94.5 |
| Breweries | 96.6 | - |
| Wineries | 63.9 | 89.5 |
| Tobacco products manufactures | 97.2 | 99.8 |

Source: Statistics Canada, pre-publication figures from Industrial Organizations and Concentration in Manufacturing, Minning and Logging Industries, 1977.

Table 6.6 PROVINCIAL PERCENTAGE DISTRIBUTIONS OF SELECTED STATISTICS OF THE FOOD AND BEVERAGE INDUSTRIES, CANADA, 1974

| Province | Establish-ments | Production Workers | Cost of Materials & Supplies | Value of Shipments | Value Added Manu-facturing | Value Added as Percentage of V.A. all Industries |
|---|---|---|---|---|---|---|
| | | | - percent - | | | |
| Newfoundland | 2.01 | 3.79 | 0.76 | 1.01 | 1.53 | 25.10 |
| Prince Edward Island | 1.38 | 0.86 | 0.53 | 0.50 | 0.46 | 68.99 |
| Nova Scotia | 4.29 | 4.76 | 2.33 | 2.46 | 2.65 | 19.68 |
| New Brunswick | 3.33 | 4.43 | 3.20 | 3.02 | 2.74 | 20.23 |
| Quebec | 28.04 | 25.43 | 27.05 | 25.67 | 25.02 | 11.57 |
| Ontario | 32.34 | 38.16 | 38.17 | 40.01 | 44.59 | 10.96 |
| Manitoba | 5.64 | 5.08 | 5.98 | 5.52 | 4.41 | 21.67 |
| Saskatchewan | 3.87 | 2.57 | 3.23 | 3.03 | 2.51 | 29.98 |
| Alberta | 8.81 | 6.61 | 11.20 | 9.95 | 7.04 | 23.80 |
| British Columbia | 10.19 | 8.28 | 7.54 | 7.92 | 9.04 | 12.14 |
| Yukon & N.W.T. | 0.10 | 0.03 | 0.01 | 0.01 | 0.01 | 14.10 |
| Canada | 100.00 | 100.00[a] | 100.0 | 100.0 | 100.0 | 12.66 |

[a]Based on sum of provincial estimates (145,011) rather than reported national total of 149,001.

Source: Statistics Canada, Cat. 31-2038.

## 6.4 WHOLESALERS/BROKERS/COMMISSION AGENTS

The wholesaling function consists in assembling and/or further manufacturing the various types and forms of a product for sale to retailers. The fruit and vegetable industry is a good example of one with a clearly defined wholesale function, with terminal markets set up in each major population centre to assemble up to 60 produce commodities from various suppliers for resale to retailers. In the beef industry, independent wholesalers are important only in the deficient Montreal market. Wholesalers and retailers buy from meat packers in Western Canada, provide various services in breaking the carcass into primal cuts and bone carcasses, and often process sub-primal cuts for shipment to retail outlets. In other areas of Canada, the meat packers and retailers have assumed the wholesale function. In the poultry and dairy industry, the wholesale function has been generally assumed by the processor. An example of this is Swift Foods Ltd. that manufacture, wholesale and promote 'butterball' turkeys, and Kraft Foods Ltd. that do likewise for their manufactured dairy products.

Large retailers have vertically integrated backward to assume the wholesaling function. For example, companies like Steinberg, Dominion and Safeway perform much of their own assembling and service function by dealing directly with major suppliers of various food commodities.

Government involvement in the wholesale function is limited. Agriculture Canada licences produce wholesalers and brokers to ensure that proper trade ethics are practiced and producers are paid for the product they supply. In 1974, there were approximately 460 licensed produce wholesalers in Canada with large retail stores owning about 35 of these.

Brokers are responsible for negotiating sales between buyers and sellers of a product without ever owning the product themselves. The brokerage function is especially active in the produce industry, as well as in the meat trade between Eastern and Western Canada. Food brokers are an integral part of the food merchandising system in Canada. Besides negotiating sales, they often provide other services such as arranging transportation.

Commission agents also perform a wholesaling function, usually without owning the product. They sell the commodity and deduct their handling and selling charges, returning the balance to the owner. Today their services constitute a very minor portion of the food system. An example would be certain Toronto produce wholesalers who handle greenhouse vegetables for producers on commission.

## 6.5 RETAILERS

After goods have been assembled from various places and transported to a central warehouse, they must then be dissassembled into quantities suitable for purchase by individuals and families. The key function of food retailers is to provide consumers with easy access to food products in small quantities. These range from only slightly altered farm commodities, such as a five-kilogram bag of graded potatoes, to highly processed meals served in a restaurant or hospital. While service in small quantities is the essential characteristic of retailing, a firm classified as a retailer may also have its own warehousing and supply several retail outlets using its own fleet of trucks. It may own processing facilities, and even assemble commodities at the farm level, transporting them to its central market locations.

Food retailing is generally far removed from farming. It is obvious to every consumer that a few large firms do most of the food retailing in Canada. If this concentration in a few firms continues to grow, they may be able to dictate prices to farmers on the one hand and to consumers on the other, along with other deleterious manifestations of non-competitive behavior. Alternatively, these strong retailers act as a check on powerful processors. The private labels of the large retail chains, for example, provide a market for the smaller processors. This protects farmers against monopsony power, and consumers against monopoly power.

The merchandising and promotional tactics of good retailers can have a significant influence upon the relative quantities of farm products that are sold. This may affect the welfare of sheep versus hog farmers, for example, and may consign to the processing channel Canadian fruits and vegetables that might otherwise have been sold fresh. In the same fashion, retailers can greatly influence whether the product sold is domestic or imported.

### 6.5.1 Chain and Independent Stores

The retail food sector is of major importance to the Canadian economy in terms of volume of sales and numbers of people employed. About 22,000 food stores have gross sales of $12 billion annually (Table 6.7). The volume estimated reflects about 26 percent of total Canadian retail sales, according to a report published by the Food Prices Review Board.

In terms of numbers of stores, there is a growing trend toward smaller 'convenience' stores (Table 6.8). However, as operating overhead continues to increase, it is expected that there will be fewer but larger multi-service stores being built, while

Table 6.7 FOOD STORE SALES, CANADA, 1975

| | Chains[a] | | | INDEPENDENTS | | TOTAL STORES |
|---|---|---|---|---|---|---|
| | Super-markets | Chains | Conven-vience | Major Groups | Minor[b] Groups | Minor[c] Groups | |
| | | | | - $000 - | | | |
| ATL. PROVS. | | | | | | | |
| No. of Stores | 114 | | 27 | 238 | 96 | 2,542 | 3,017 |
| Dollar sales | | $489,600 | | | $176,000 | $298,5000 | $964,100 |
| % of total | | 50.8% | | | 18.3% | 30.9% | 100% |
| QUEBEC | | | | | | | |
| No. of stores | 307 | | 245 | 2,213 | 1,167 | 3,256 | 7,188 |
| Dollars sales | | $1,540,000 | | | $1,373,800 | $617,300 | $3,531,500 |
| % of total | | 43.6% | | | 38.9% | 17.5% | 100% |
| ONTARIO | | | | | | | |
| No. of stores | 683 | | 1,045 | 785 | 1,105 | 2,680 | 6,298 |
| Dollars sales | | $1,284,000 | | | $767,140 | $442,860 | $4,494,000 |
| % of total | | 73.1% | | | 17.1% | 9.8% | 100% |
| MANITOBA | | | | | | | |
| No. of stores | 68 | | 98 | 303 | 300 | 370 | 1,139 |
| Dollars sales | | $289,500 | | | $126,000 | $37,700 | $453,200 |
| % of total | | 63.9% | | | 27.8% | 8.3% | 100% |
| SASKATCHEWAN | | | | | | | |
| No. of stores | 75 | | | 239 | 145 | 526 | 985 |
| Dollars sales | | $187,900 | | | $96,600 | $54,800 | $339,300 |
| % of total | | 55.4% | | | 28,5% | 16.1% | 100% |
| ALBERTA | | | | | | | |
| No. of stores | 105 | | 125 | 406 | 527 | 340 | 1,503 |
| Dollars sales | | $511,300 | | | $221,000 | $55,600 | $787,900 |
| % of total | | 64.9% | | | 28.0% | 7.1% | 100% |
| BR. COLUMBIA[d] | | | | | | | |
| No. of stores | 222 | | 115 | 360 | 598 | 1,082 | 2,377 |
| Dollars sales | | $904,800 | | | $309,600 | $147,100 | $1,361,500 |
| % of total | | 66.5% | | | 22.7% | 10.8% | 100% |
| CANADA | | | | | | | |
| No. of stores | 1,574 | | 1,655 | 4,544 | 3,938 | 10,796 | 22,507 |
| Dollars sales | | $7,207,500 | | | $3,070,140 | $1,653,860 | $11,931,500 |
| % of Canada | | 60.4% | | | 25.7% | 13.9% | 100% |

[a]Chain stores: four or more stores under single name.
[b]Voluntary groups: independents operating in major or secondary wholesales sponsored group programs.
[c]Unaffiliated Independents: all other grocery and combination store.
[d]Includes Yukon and Northwest Territories.

Source: Canadian Grocer estimates, based on the nine-month Statistics Canada figures for Grocery and Combination Stores, and Canadian Grocer's 1975 survey of chains and groups.

older, smaller 'corner grocery stores' are closed down. The increase in numbers of convenience stores will continue into the foreseeable future.

Table 6.8 shows the distribution of store sales in 1975 and Table 6.9 gives comparative figures for 1961 and 1966. This reveals that while in 1961 stores doing over $100,000 per year accounted for 48.5 percent of all stores and 90 percent of sales, by 1966 this had changed to 63 percent of stores and 94 percent of sales.

Table 6.8 NUMBER OF CHAIN STORES, CANADA, 1973, 1975 & 1976

| | 1973 | 1975 | 1976 |
|---|---|---|---|
| Supermarkets | 1,605 | 1,565 | 1,549 |
| Convenience Stores | 1,331 | 1,655 | 1,858 |
| Total | 2,936 | 3,221 | 3,407 |

[a]Data for 1974 is unavailable at time of writing.
Source: Economics Branch, Agriculture Canada.

Table 6.9 COMBINATION STORES BY ANNUAL VOLUME, CANADA, 1961, 1966, AND 1971

| Sales | 1961 | | 1966 | | 1971 | |
|---|---|---|---|---|---|---|
| | Stores | Sales | Stores | Sales | Stores | Sales |
| | | | - percent - | | | |
| $ 1,000,000 and over | / | 46 | 9 | 48 | 18.5 | 66.0 |
| $ 500,000 - 999,999 | / | 18 | 9 | 18 | 13.0 | 14.0 |
| $ 200,000 - 499,999 | 14 | 16 | 19 | 18 | 25.0 | 12.0 |
| $ 100,000 - 199,999 | 21 | 10 | 26 | 10 | 24.0 | 5.5 |
| $ 50,000 - 99,999 | 25 | 7 | 23 | 5 | 14.0 | 2.0 |
| $ 10,000 - 49,999 | 25 | 3 | 13 | 1 | 5.0 | 0.5 |
| under - 10,000 | 1 | - | 1 | - | 0.5 | - |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |

Source: Statistics Canada, Cat. 97-503, 97-605, and 97-705.

In 1973, chain stores (excluding convenience stores) had sales of $4,936 million, and with 7 percent of all food stores, they accounted for 56 percent of total grocery combination sales. Independents at $3,893 million accounted for 44 percent. For the chains, this reached 57.6 percent in 1974 and 60.4 percent in 1975. The magazine Canadian Grocer estimates that chain store concentration of sales may reach 61.5 percent in 1976.

Recent investigations of food retailing in Canada have demonstrated that this function is dominated by a few large firms. These firms compete fairly actively against each other in market areas where they meet. In some parts of the country, notably the west, each urban market area tends to be dominated by one giant firm. As might be expected, food prices are generally higher in those cities than in parts of Canada where there is more direct inter-firm competition for sales volume.

Studies of retail concentration in 32 large urban areas, including Canada's 26 largest cities and metropolitan areas, show that four corporate organizations made 64 percent of Canadian grocery and combination store sales in 1973. Indications are that this figure has risen each year since then. To a significant extent, the chains tend to concentrate their locations, and therefore sales penetration, to larger urban areas leaving the smaller markets to independent and unaffiliated retailers.

### 6.5.2 Hotel, Restaurant and Institutional Industry

The hotel, restaurant and institutional (HR&I) industry includes:

(1) hotels,
(2) motels,
(3) employee foodservice operations,
(4) hospitals and related institutions such as nursing homes,
(5) tourist outfitters & campgrounds,
(6) restaurants,
(7) catering, vending & franchising operations, homes for the aged, the blind and chronically ill,
(8) correctional institutions, and
(9) Food servbice facilities in secondary schools, colleges and universities.

The number of outlets in 1974-75 was as follows:

| | |
|---|---|
| Eating places all types | 31,800 |
| Hospitals, all types | 4,742 |
| Accommodations group | 17,800 |
| Private clubs | 3,400 |
| Total, all foodservice outlets | 57,742 |

The estimated cost of raw food purchased was $1.7 billion (Table 6.10), while estimated sales were $4.3 billion (Table 6.11). In 1974, direct employment from the accommodations and food service groups reached 384,000 people and it is estimated that in 1982, the figure will have increased by 100,000.

Several trends concerning the HR&I trade have emerged lately. These trends seem to have had an effect on the rate of change and the direction of the industry. In general, the move is towards big restaurant chains and franchises. In addition, there are food services in areas where previously none had existed. Restaurant chain sales in 1975 grew at a rate of 24 percent as opposed to 11 percent for the independent restaurants. The top 50 firms in the HR&I trade now account for approximately 45 percent of the entire industry in Canada.

Table 6.10 HOW THE FOODSERVICE FOOD COST DOLLAR IS SPENT, CANADA 1975

| Product | % | $ |
|---|---|---|
| Meat | 35 | 578,840,000 |
| Poultry | 6 | 99,230,000 |
| Eggs | 2 | 33,077,000 |
| Fish and seafoods | 3 | 49,615,000 |
| Vegetable, fresh, frozen or canned | 9 | 148,845,000 |
| Fruits, fresh, frozen or canned, jams and jellies | 3 | 49,614,000 |
| Dairy products - milk, butter, cheese, ice cream | 14 | 231,536,000 |
| Bakery products, including bread and rolls | 6 | 99,230,000 |
| Beverages - coffee, tea, hot chocolate | 5 | 82,691,000 |
| Juices, ades, drinks, including carbonated | 2 | 33,007,000 |
| Shortening and cooking oils | 2 | 33,076,000 |
| Sugar, syrups, confections | 6 | 99,230,000 |
| Spices, seasonings, condiments, sauces | 2 | 33,077,000 |
| Dessert products, miscellaneous processed foods | 2 | 33,076,000 |
| Flour and mill products, pasta, cereals, rice | 3 | 49,614,000 |
| TOTALS | 100 | 1,653,828,000 |

Source: Foodservice & Hospitality Magazine.

Table 6.11 SUMMARY OF ESTIMATED FOODSERVICE VOLUME, CANADA 1975

| | |
|---|---|
| ccommodations group, sale of meals | $454,900,000 |
| ales of food and beverages through vending | 122,014,000 |
| ales of sandwiches, prepared foods, catering by bakeries | 1,426,000 |
| estaurant sales, adjusted for indicated 7% under-estimate | 2,119,135,000 |
| epartment store sales of meals and lunches | 134,953,000 |
| ost of foodservice for airlines | 49,034,00 |
| ost of foodservice for railways | 22,379,000 |
| econdary school, college and university foodservice receipts | 367,949,000 |
| otion picture and drive-in theatres revenues from sales of candy, drinks, etc. | 39,363,000 |
| rivate clubs, estimated food sales | 35,175,000 |
| eal and lunch sales by amusement and recreation group, other business and personal services | 96,897,000 |
| ateries, estimated receipts | 218,618,000 |
| ndustrial restaurants, estimated receipts | 275,618,00 |
| otal commercial receipts | 4,017,018,000 |
| dd:- Cost of raw food bought by hospitals | 129,082,000 |
| - Cost of raw food bought by special care facilities | 100,419,000 |
| - Cost of food bought for correctional institutions, not including county jails | 15,938,000 |
| - Department of National Defence cost of food and labor | 70,000,000 |
| - Adjustment to convert hospital, correctional & instituion foodservice to retail equivalent | 114,512,000 |
| ess: Adjustment to eliminate duplication for catered service in schools, colleges, airlines | 145,944,000 |
| otal as adjusted | 4,301,025,000 |

ource: Food Source & Hospitality Magazine

## 6.6 INDUSTRIAL AND EXPORT MARKETS

In addition to the food and beverage industries (which include feed manufacturing, distilleries, etc.), agricultural products and by-products are used for various industrial purposes.

The major agricultural product in this category is tobacco. In 1973, there were eight and 17 establishments in the Tobacco Processors and Tobacco Products Manufacturers industries with value added of $14.8 and $248 million, respectively. In each of these industries, the largest four firms accounted for over 90 percent of factory shipments in 1965.

In 1973, there were 21 fibre processing mills with a total value added of $10 million. The largest four firms accounted for about 50 percent of factory shipments in 1965. The textile industry, of course, includes a wide variety of sub-industries.

By-products of the food processing industry include such diverse items as cattle hides, sausage casings, tallow, medical drugs, and fine oils. In most cases, these markets do not significantly affect farm incomes; exceptions include the by-products of beef slaughter which are reported to have a value roughly equal to slaughtering costs. The more important by-product markets are discussed in the various commodity reports but little information is available on the structure of these markets.

The value of agricultural exports (Table 6.12) shows the dominance of wheat, barley, oilseeds and wheat flour. The Canadian Wheat Board is responsible for wheat and barley exports and provides all the functions necessary to sell abroad. Multinational grain companies act as agents in some CWB sales. Rapeseed sales are susually under contract between agencies in importing countries and grain companies in Canada. Vertical integration has occurred to the point where Japanese companies own and operate some crushing plants in Western Canada. Other oilseeds are handled by private companies on a spot market basis. Wheat flour exports are handled by private companies who negotiate the price and allocation of functions, but flour exports require a permit from the CWB.

Live cattle exports have declined recently as have exports of fresh and frozen beef. Private businesses handle the majority of these sales. Hog sales to Japan are contracted by provincial marketing boards while processors import substantial processed pork products and some industrial milk products are imported by the Canadian Dairy Commission. Government has supplied the mechanisms for the establishment of export organizations, i.e., the CWB, CDC and boards. In many cases, facilities are provided and 'backup' aids for marketing are part of the government function.

Table 6.12 TOTAL EXPORT OF AGRICULTURAL PRODUCTS TO ALL COUNTRIES CANADA, AVERAGE 1967-1971, 1972, 1974 and 1976

| Commodity | Average 1967-1971 | 1972 | 1974 | 1976[b] |
|---|---|---|---|---|
| All Commodities | 14,544,619 | 19,660,668 | 31,674,495 | 37,258,769 |
| Agricultural Products | 1,533,800 | 2,135,386 | 3,860,403 | 3,959,948 |
| Grainsa | 793,477 | 9,158,174 | 2,407,420 | 2,375,285 |
| Grain products (human) | 86,596 | 84,862 | 142,865 | 201,046 |
| Animal feeds | 46,954 | 63,058 | 79,270 | 108,419 |
| Oilseeds | 130,624 | 212,852 | 380,483 | 282,559 |
| Oilseed products | 26,777 | 30,330 | 44,891 | 47,915 |
| Animals living | 50,326 | 77,245 | 78,114 | 119,805 |
| Meatsc | 83,801 | 130,136 | 140,055 | 206,562 |
| Other animal products | 89,363 | 111,935 | 171,181 | 204,066 |
| Dairy products | 44,726 | 48,790 | 66,731 | 60,642 |
| Poultry and eggs | 8,018 | 7,869 | 24,171 | 15,288 |
| Fruits and nuts | 26,269 | 22,533 | 30,822 | 30,727 |
| Vegetables (excl. potatoes) | 35,091 | 38,009 | 58,050 | 69,819 |
| Potatoes and products | 13,665 | 10,513 | 23,484 | 45,540 |
| Seeds for sowing | 14,814 | 16,774 | 26,862 | 20,819 |
| Maple products | 6,516 | 3,262 | 22,390 | 17,116 |
| Sugar | 2,299 | 3,262 | 22,390 | 17,116 |
| Tobacco, raw | 53,567 | 53,224 | 71,424 | 62,899 |
| Vegetable fibres | 1,188 | 1,593 | 4,017 | 5,456 |
| Plantation crops | 2,757 | 3,302 | 7,132 | 10,193 |
| Other agricultural products | 36,972 | 53,592 | 74,610 | 77,908 |

[a]Excludes seed wheat and seed oats (included in Sowing).
[b]Excludes oilcake and meal (see Oilseed Products).
[c]Includes fancy meats (offals) (beef - $5,320; pork - $10,840 thousand) 1974
(beef - $7,273; pork - $10,295 thousand) 1976.

Source: Agriculture Canada, Canada's Trade in Agriculture Products, 1974, 1975 and 1976.

## 7. FOOD CONSUMPTION IN CANADA - HIGHLIGHTS

1975

1. Total food consumption has remained nearly stable since 1961 and is expected to continue in this way.

2. Canadians spend a smaller proportion of their disposable income on food today than they did fifteen years earlier.

3. The last fifteen years have seen much larger increases in consumer price indexes for animal products than for plant products.

4. The average consumer spends proportionately less of disposable income on meat, poultry, fruits and vegetables, dairy and cereal products, and more on fish, fats and oils, frozen foods and food away from home than in 1962.

5. The composition of the food basket will continue to change through 1986: consumption of red meats except pork, of fruits and vegetables, and of fats and oils except lard, is expected to increase; consumption of fish and eggs is expected to remain relatively unchanged and that of dairy products will decline; cereals and sugar consumption may decrease.

6. Consumers in higher income groups spend more on red meat and frozen foods, and an increasingly larger portion of their food budgets on food away from home.

7. There is an almost total absence of nutritional-related diseases among Canadians. However, the per-capita energy available for consumption (3000 kcal./day) is considered to be too high in view of the increasingly sedentary lifestyle of Canadians.

8. More foods may need to be fortified in the future because processing tends to reduce their vitamin and mineral content.

9. Obesity and coronary heart disease are the most serious diet-related health problems; consequently, decreased consumption of calories, while maintaining proper nutrition, as well as other healthful practices, such as exercise and avoidance of stress, should be of concern.

## 7. FOOD CONSUMPTION[1] IN CANADA

This section examines present food consumption patterns, with a look at some of the significant changes over the period 1961-74. Consumption statistics for the years 1950 to 1960 are not available for comparison on the same basis as more recent figures and therefore will not be discussed. The data referred to represent food disappearance, i.e., that available at the retail level without allowance for losses, wastage or for consumption of home-grown products.

### 7.1 TRENDS IN FOOD CONSUMPTION

There has been a marked change in the composition of the food basket since 1961, even though the consumption of total food has remained nearly stable (Figure 7.1). Total annual food consumption increased only 2.4 percent to about 663 kilograms per person in 1974 (Table 7.1).

A comparison of animal products reveals that poultry consumption rose the highest, followed by beef and pork; the consumption of fish remained fairly stable but that of veal, mutton and lamb, and dairy products decreased. Consumption of cereals was almost identical in 1974 and 1961, while consumption of most other plant products as well as that of fats and oils increased.

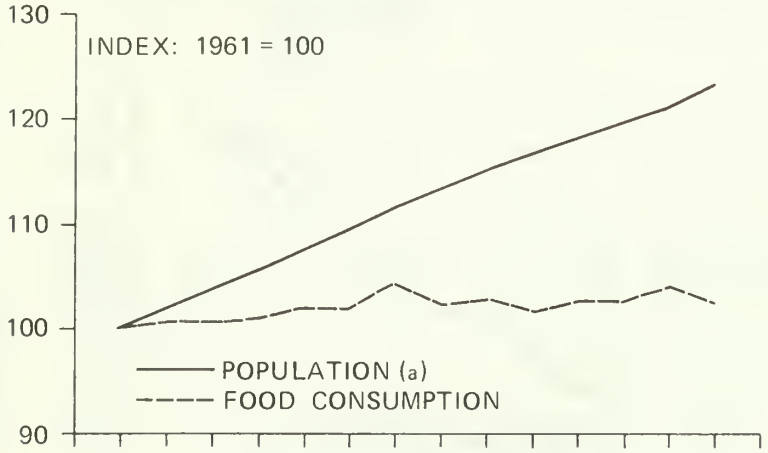
On the whole, consumption of plant products increased 7.9 percent between 1961 and 1974, while that of animal products decreased 4.4 percent mainly due to the reduced consumption of dairy products and eggs. Most other food commodities recorded consumption increases (Figures 7.2 to 7.8).

Food disappearance data for the 1961-74 period indicate little change in per-capita energy available for consumption, averaging approximately 3,000 kilocalories per day. Most of the dietary energy (released from proteins, carbohydrates and fats) comes from meats, dairy products, cereals, sugars and syrups, and fats and oils. The most noticeable change over the period is the decreased proportion of energy from eggs and dairy products and an increase in calorie contribution from meats. However, despite the increase in meat disappearance, the calorie contribution of proteins remained fairly stable.

### 7.2 FOOD EXPENDITURES AND INCOME

In 1975, the per-capita personal expenditures on food were $864, an increase of 171 percent from 1961 (Table 7.2). However, per-capita disposable income increased 221 percent to $4,734 in the same period. Food expenditures thus accounted for 21.6 percent of disposable income in 1961 but only for 18.3 percent in 1975, indicating that Canadians spent less of their disposable income for food in 1975 than they did fifteen years

FIGURE 7.1
POPULATION & PER-CAPITA FOOD CONSUMPTION, CANADA, 1961 to 1975




(a) POPULATION JUNE 1

FIGURE 7.2
PER-CAPITA CONSUMPTION OF SELECTED ITEMS, CANADA, 1961 to 1975

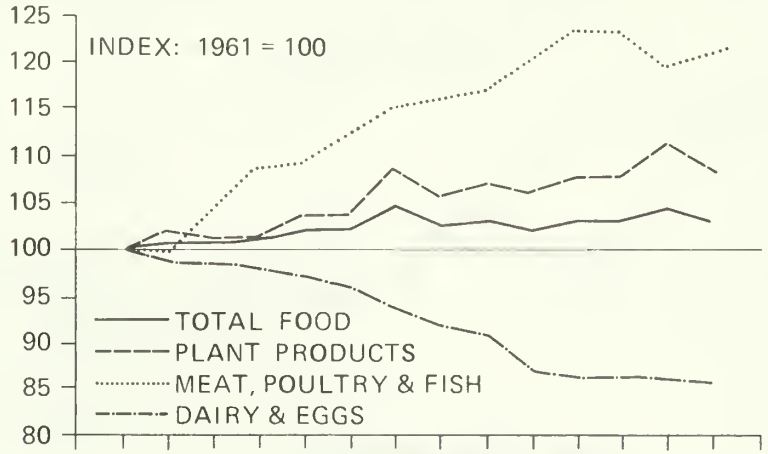



FIGURE 7.3
PER-CAPITA CONSUMPTION OF FRUITS & VEGETABLES, CANADA, 1961 to 1975

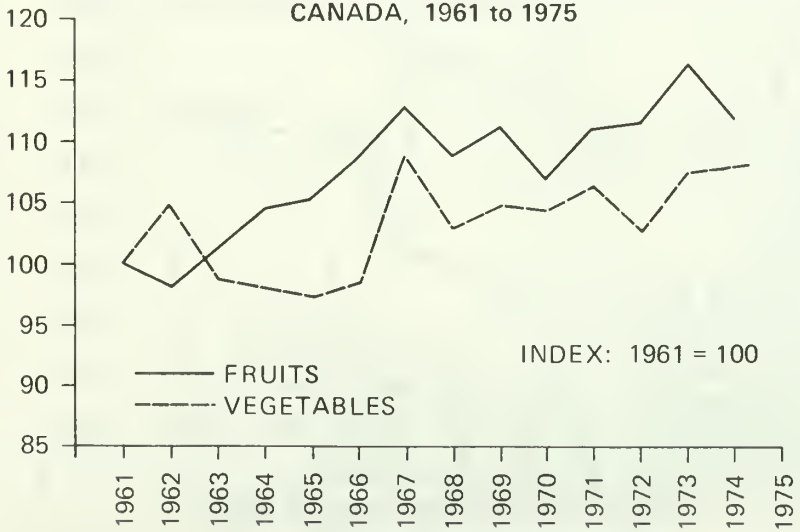



FIGURE 7.4
PER-CAPITA CONSUMPTION OF SUGAR, SYRUPS & BEVERAGES, CANADA, 1961 to 1975

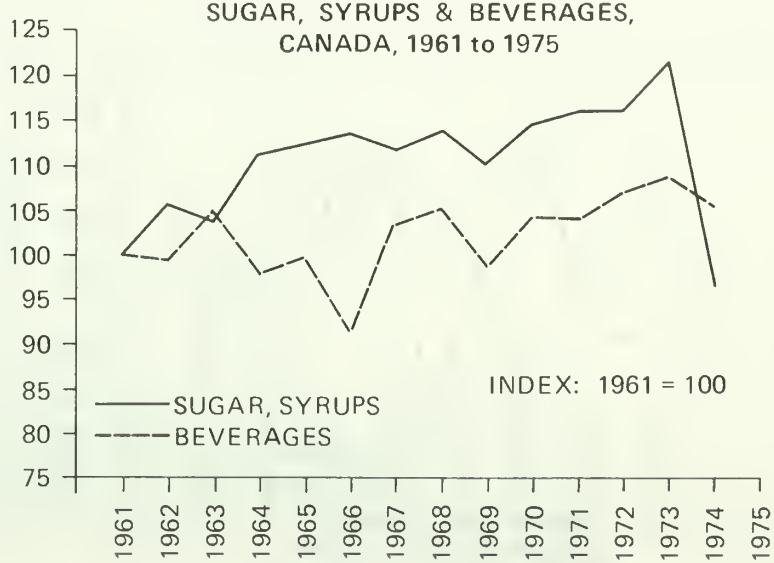


FIGURE 7.5
PER-CAPITA CONSUMPTION OF
OILS, FATS, PULSES, NUTS & CEREALS,
CANADA, 1961 to 1975

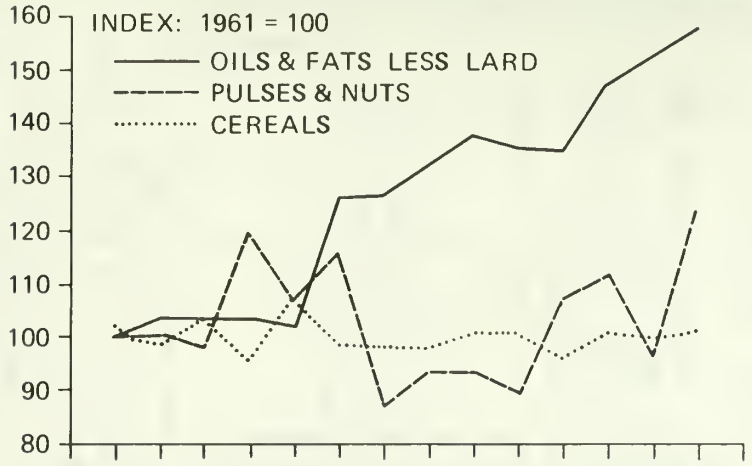



FIGURE 7.6
PER-CAPITA CONSUMPTION OF
POTATOES & TOMATOES,
CANADA, 1961 to 1975


FIGURE 7.7
PER-CAPITA CONSUMPTION OF
RED MEAT, POULTRY & FISH,
CANADA, 1961 to 1975

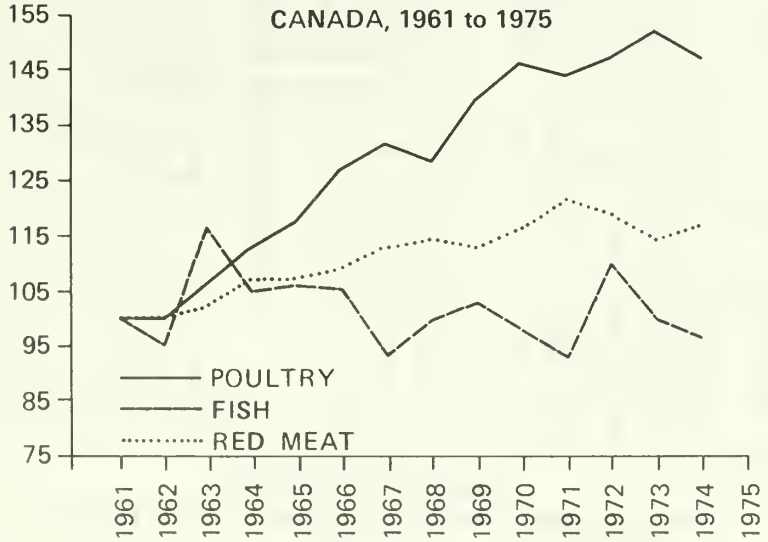



FIGURE 7.8
PER-CAPITA CONSUMPTION OF
DAIRY PRODUCTS & EGGS,
CANADA, 1961 to 1975

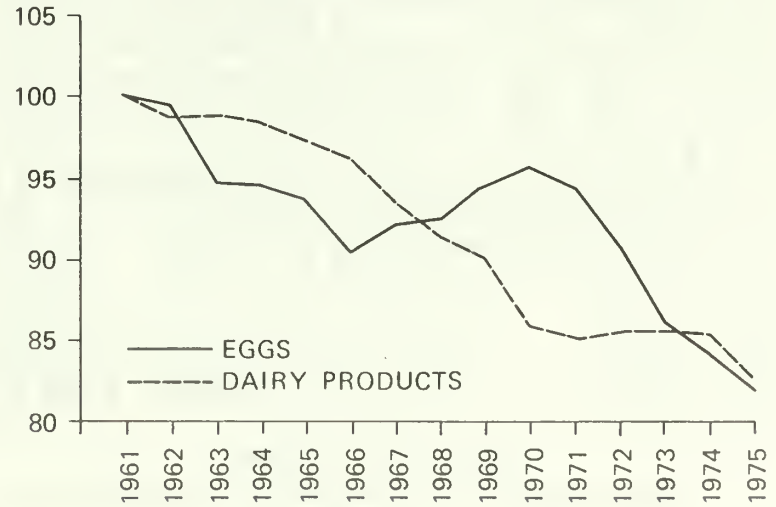


Table 7.1 PER-CAPITA FOOD CONSUMPTION, CANADA, 1961 and 1974

| | 1961 | 1974 | Percent Change 1974-1961 |
|---|---|---|---|
| | - kilograms - | | % |
| Meata | 64.1 | 74.7 | 16.4 |
| Beef | 32.1 | 43.1 | 34.3 |
| Pork | 22.9 | 27.2 | 18.9 |
| Veal | 3.1 | 1.6 | -48.5 |
| Mutton and Lamb | 1.6 | 1.1 | -28.6 |
| Offal | 2.1 | 1.7 | -17.8 |
| Canned Meat | 2.5 | -- | -83.3 |
| Poultryb | 14.1 | 21.3 | 46.8 |
| Chicken & Fowl | 10.5 | 15.5 | 48.7 |
| Turkey | 3.5 | 4.8 | 38.2 |
| Others | 0,2 | 0.3 | 75.0 |
| Fishc | 5.6 | 5.4 | -4.1 |
| Lardd | 3.9 | 3.4 | -11.8 |
| Eggse | 15.4 | 13.0 | -15.9 |
| Dairy Productsd | 182.1 | 155.2 | -14.8 |
| Total Butter | 7.5 | 6.1 | -19.4 |
| Total Cheese | 3.4 | 7.2 | 112.0 |
| Cottage Cheese | 0.6 | 1.1 | 76.9 |
| Concentrated Milk Products | 5.0 | 4.8 | -3.6 |
| Concentrated Wholemilk Products | 8.7 | 5.2 | -39.8 |
| Ice Cream | 6.0 | 6.8 | 12.9 |
| Fluid Milk | 151.1 | 124.1 | -17.9 |
| Cerealsd | 69.2 | 69.8 | .9 |
| Sugar and Syrupsd | 44.9 | 43.4 | -3.3 |
| Fats and Oilsdf | 10.2 | 16.1 | 58.0 |
| Fruitse | 78.5 | 88.0 | 12.2 |
| Vegetablese | 51.8 | 56.7 | 9.5 |
| Tomatoese | 26.6 | 29.5 | 10.6 |
| Mushroomse | | 2.1 | 125.0 |
| Potatoese | 67.3 | 69.3 | 3.0 |
| Beveragesg | 6.5 | 6.9 | 5.6 |
| Total Food Consumed | 647.7 | 663.4 | 2.4 |

aCarcass weight
bEviscerated weight
cEdible weight
dRetail weight
eFresh Equivalent weight
fExcluding lard
gTea leaf equivalent and green bean equivalent

Source: Statistics Canada, Cat. 32-226.

Table 7.2 POPULATION AND FOOD EXPENDITURES, CANADA, 1961 TO 1975

| Year | Population (June 1) | Food as a Percentage of Disposable Income | Food as a Percentage of Personal Expenditures |
|---|---|---|---|
| | 000 | - % - | |
| 1961 | 18,238 | 21.60 | 22.41 |
| 1962 | 18,583 | 20.71 | 22.13 |
| 1963 | 18,931 | 20.45 | 21.81 |
| 1964 | 19,290 | 20.41 | 21.49 |
| 1965 | 19,644 | 19.73 | 21.08 |
| 1966 | 20,015 | 19.16 | 20.73 |
| 1967 | 20,378 | 18.92 | 20.40 |
| 1968 | 20,701 | 18.19 | 19.48 |
| 1969 | 21,001 | 17.94 | 19.23 |
| 1970 | 21,297 | 17.97 | 19.28 |
| 1971 | 21,569 | 18.16 | 19.70 |
| 1972 | 21,830 | 17.77 | 19.67 |
| 1973 | 22,095 | 18.12 | 20.32 |
| 1974 | 22,446 | 18.24 | 20.56 |
| 1975 | 22,800 | 18.27 | 20.75 |

Sources: (1) Statistics Canada, Cat. 91-201.
(2) Statistics Canada, Cat. 13-531 E and F Occasional - to be published.

earlier (Figure 7.9). In 1975, about 78.5 percent of total food expenditures were for food consumed at home, and the remainder (21.5 percent) represented purchases of meals away from home.

Information on per-capita weekly food expenditures by income groups for the 1969 and 1974 periods indicates the following:

(1) In general, per-capita expenditures on food at home appears not to be affected by income levels. However, higher income groups spend an increasingly larger portion of their food budget on food away from home compared with lower income groups.

(2) Consumers in higher income groups spend more on red meat and frozen foods than do consumers in the lower income groups.

(3) Expenditures on poultry, fish, fats and oils, dairy products, miscellaneous groceries, beverages and eggs appear to be constant across the various income groups. Expenditures on fruits and vegetables, cereals and bakery products show no definite trend.

Food surveys also indicate (Figure 7.10) that average expenditure shares on major food items for 1974 (and 1969) show some notable differences and were as follows: meats, poultry and fish 26.7 percent (29.1), fruits and vegetables 11.7 percent (14.2), dairy products 10.4 percent (11.5), cereal and bakery products 8.8 percent (12.7), eggs, fats and oils, and frozen foods accounted for the remainder of total food expenditures.

The above figures indicate that there have been some changes in the food buying habits of consumers from 1969 to 1974. In 1974, consumers were spending less on meat and poultry, fruits and vegetables, dairy products and cereal and bakery products than in 1969. However, in 1974, consumers were spending a larger proportion of their food money on fish, fats and oils, frozen foods and food away from home.

The trend toward spending a larger proportion of food money on foods away from home and on convenience foods can be expected to continue with changing life style.

The most significant change is that wives are working outside the home. Not only do working women want to be able to prepare meals quickly after work but also husbands and children prepare their own meals more frequently, increasing the demand for convenience foods.

The average family size is smaller, now around 3.6 in Canada. This means that more money is available for prepared foods, the prices of which include the cost of preparation.

FIGURE 7.9
FOOD EXPENDITURES & PERSONAL DISPOSABLE INCOME,
CANADA, 1961 to 1975

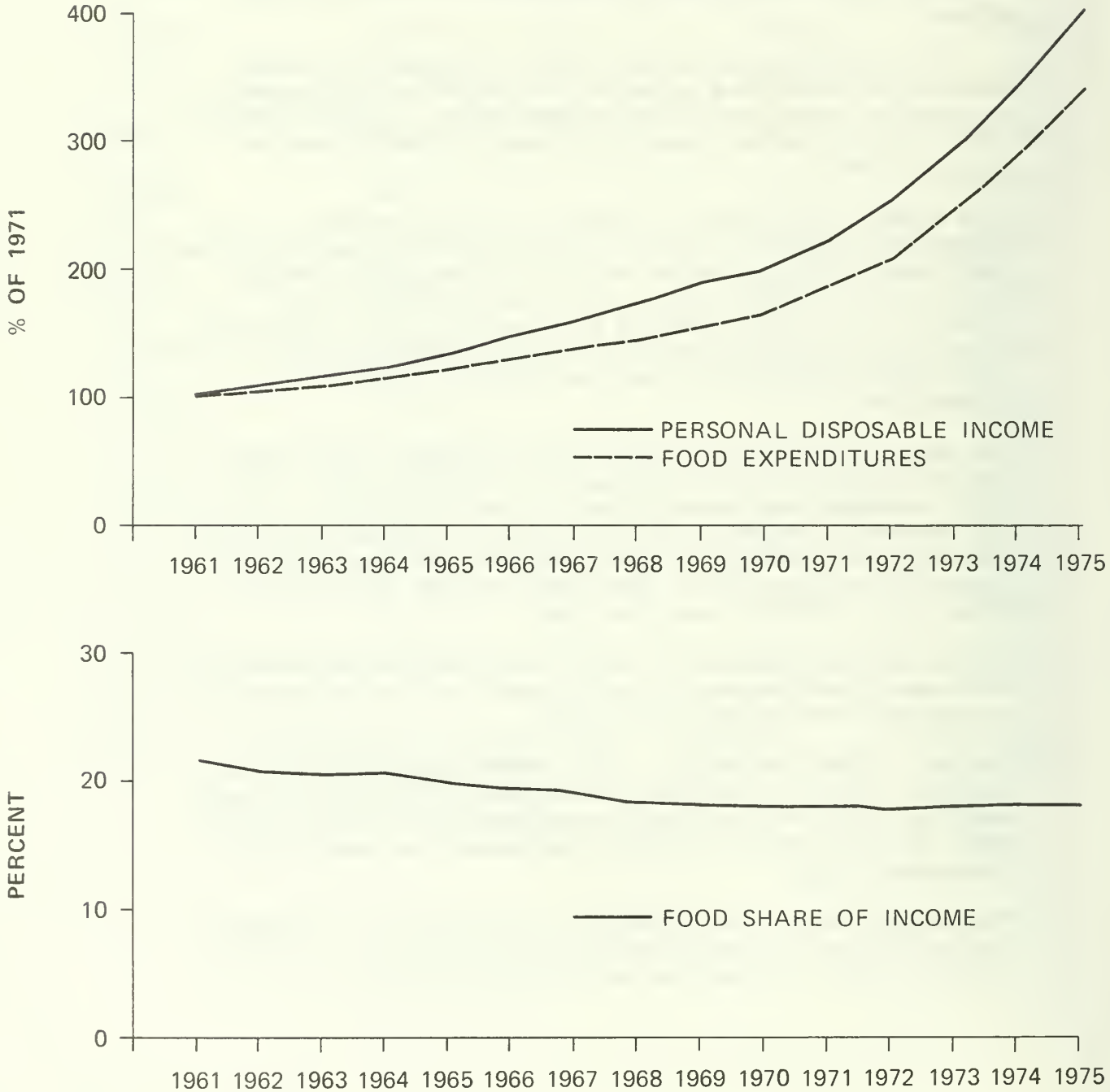
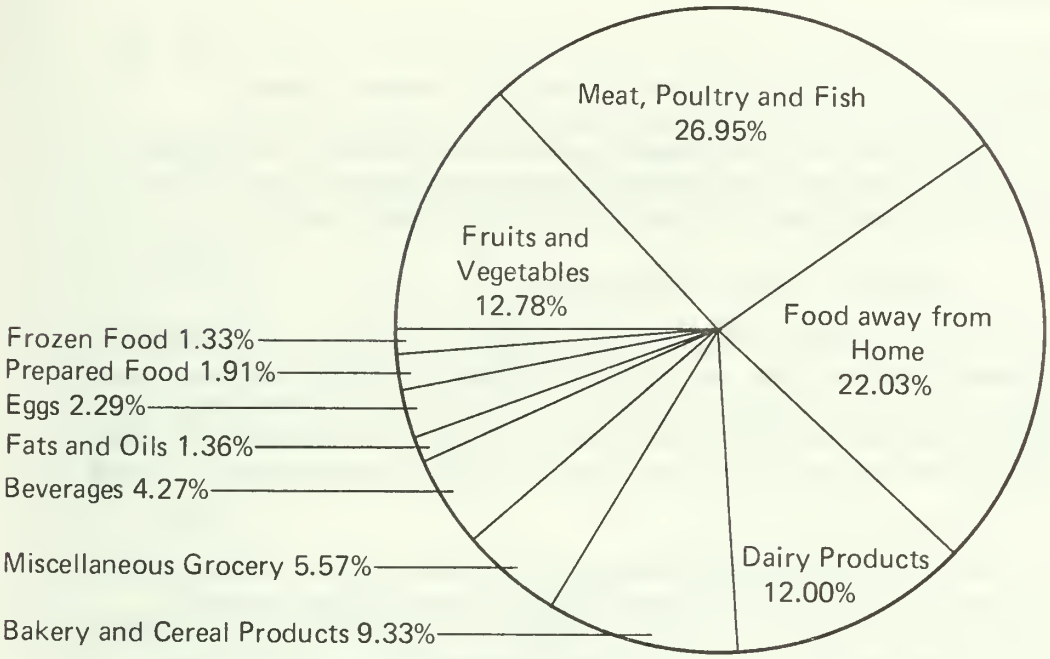
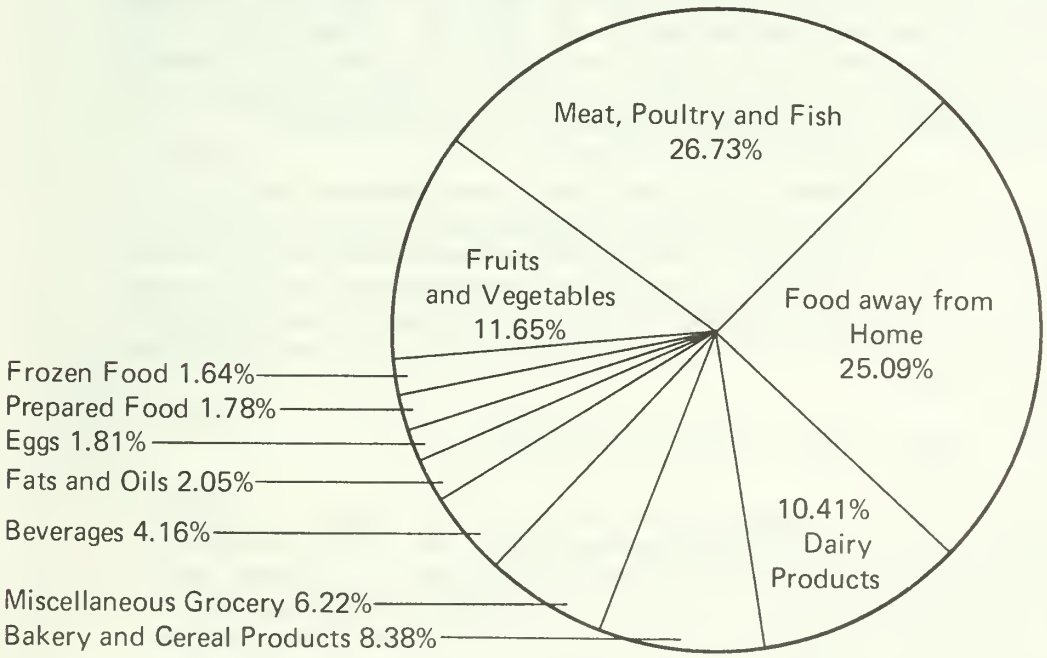


FIGURE 7.10
**ALL FOOD EXPENDITURES, CANADA, 1969 & 1974[a]**




1969[b]




1974

Source: Karamchandomi, D. Changes in Food Expenditure Patterns, 1969–74. Canadian Farm Economics, 11,5:25.

[a] Figures earlier than 1969 are not available for comparison on the same basis as the 1974 figures, but would generally reveal even stronger trends.

Meal patterns have changed, partly through the time available to working wives for meal preparation and partly through the trend to more casual living. Instead of eating three organized meals a day, many families 'snack' at irregular hours, perhaps five times daily. Many snack foods have been specially designed for this purpose with new varieties constantly being introduced.

Finally, the move to cities and to multiple-unit dwellings has changed buying habits. There is reduced storage space, particularly cool storage for foods like fresh potatoes. Smaller packages are in demand as well as products with long shelf life at room temperature. Once-a-week shopping means that more perishables are bought in the frozen state.

## 7.3 TRENDS IN FOOD PRICES

In the 1961-75 period, the retail food price index (1971=100) increased from 76.1 to 161.9, an increase of 127.5 percent, and the consumer price index for all items increased from 74.9 to 138.5 an increase of 84.9 percent. In both cases, much of the increase took place during the period 1972-75 (Figures 7.11 and 7.12).

There have been larger increases in consumer price indexes for animal products than for plant products (excluding sugar), especially for fish and dairy products which recorded increases of 185.4 percent and 115.2 percent respectively during the 1971-75 period (Table 7.3). Meats and poultry prices increased steadily between 1961 and 1975 and the increases were greater for pork and chicken compared with those for beef, other meats (veal, wieners and canned meat) and turkey. Between 1961 and 1972, the consumer price index for eggs remained fairly stable ranging between 114.4 and 108.4, while in 1975 it climbed to 172 (1971=100).

Except for processed fruits and beverages whose prices increased by 88 and 97 percent respectively since 1961, the prices of all other plant products increased by more than 100 percent. The increase in the price of sugar was slight from 1961 to 1973 and then sharp in 1974. Although some moderation in its price occurred in 1975, it was still 307 percent above the 1961 level.

## 7.4 NUTRITIONAL HEALTH OF CANADIANS

Although the food disapperance data provide a good indication of the nutrients available to Canadians, an investigation of clinical and bio-chemical nature is necessary to judge the nutritional adequacy of actual food intake. Findings of the extensive 1973 Nutrition Canada Survey indicate that, except for some data on Indians and Eskimos, there was an almost total absence of nutrient-related disease among Canadians. The

FIGURE 7.11
FOOD PRICE INDEXES, CANADA, 1961 to 1975

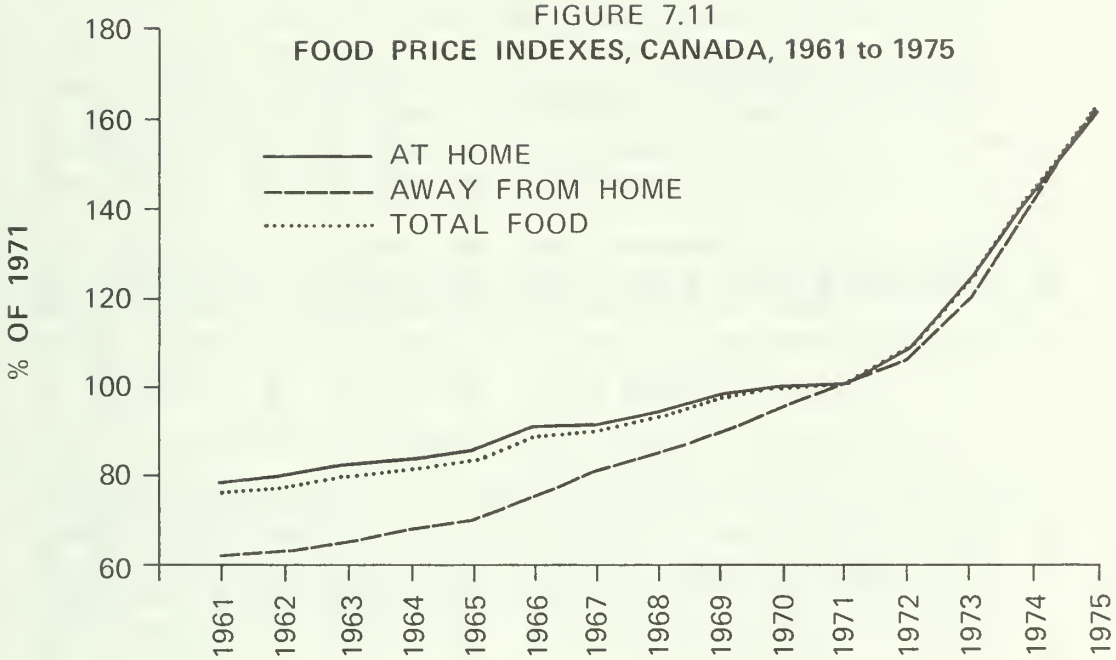



FIGURE 7.12
CONSUMER PRICE INDEXES: FOOD & ALL ITEMS LESS FOOD, CANADA, 1961 to 1975

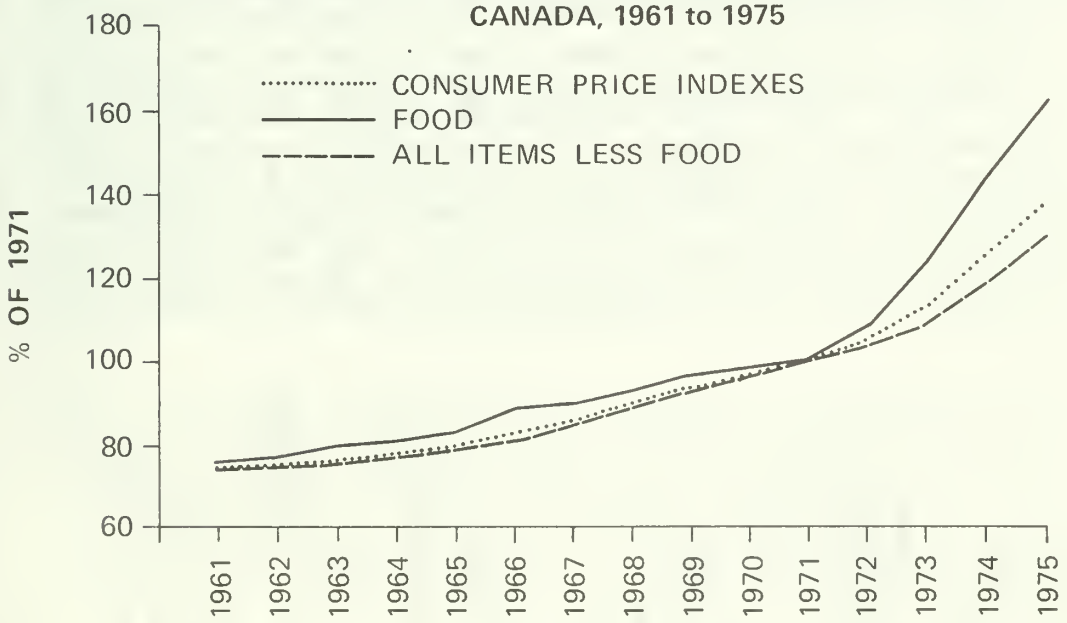


Table 7.3 PRICE INDEXES, ANIMAL AND PLANT PRODUCTS, 1961 to 1975 (1971=100)

| Items | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | Percent Change 1975 from 1961 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Animal Products | 77.5 | 82.8 | 83.7 | 82.2 | 85.7 | 94.2 | 93.1 | 95.0 | 99.1 | 100.7 | | 111.2 | 133.9 | 150.1 | 166.8 | 106.4 |
| Dairy Products | 75.8 | 73.8 | 73.5 | 75.7 | 77.7 | 83.2 | 88.7 | 92.1 | 95.5 | 96.2 | 100.0 | 105.5 | 113.2 | 129.0 | 163.1 | 115.2 |
| Fresh milk | 68.9 | 69.1 | 69.9 | 72.1 | 73.4 | 78.6 | 85.0 | 90.0 | 74.5 | 95.7 | 100.0 | 104.0 | 114.2 | 129.0 | 166.2 | 141.2 |
| Butter | 96.2 | 85.3 | 80.4 | 81.0 | 84.4 | 92.2 | 96.9 | 97.5 | 99.0 | 98.4 | 100.0 | 104.5 | 107.8 | 120.3 | 150.2 | 56.1 |
| Cheddar cheese | 70.8 | 70.5 | 71.5 | 74.3 | 77.7 | 82.2 | 86.2 | 89.2 | 92.0 | 93.9 | 100.0 | 114.0 | 116.7 | 138.4 | 167.2 | 136.2 |
| Processed cheese | 74.9 | 74.9 | 77.2 | 79.5 | 82.6 | 88.5 | 91.9 | 93.2 | 95.8 | 97.6 | 100.0 | 111.0 | 112.0 | 131.1 | 163.7 | 118.6 |
| Meat, Poultry and Fish | 76.4 | 80.7 | 80.4 | 78.4 | 82.8 | 92.5 | 91.8 | 92.8 | 99.9 | 102.2 | 100.0 | 112.9 | 139.6 | 152.0 | 159.4 | 108.6 |
| Meat | 76.2 | 81.0 | 80.2 | 78.2 | 82.9 | 93.2 | 92.6 | 93.3 | 101.5 | 103.5 | 100.0 | 112.5 | 138.2 | 148.1 | 154.6 | 102.9 |
| Beef | 69.4 | 76.0 | 73.8 | 71.4 | 74.4 | 81.9 | 86.1 | 87.6 | 94.8 | 97.6 | 100.0 | 109.3 | 132.0 | 145.6 | 137.5 | 98.1 |
| Pork | 91.3 | 94.2 | 94.2 | 92.2 | 102.8 | 118.9 | 107.5 | 106.6 | 119.2 | 116.9 | 100.0 | 120.8 | 153.7 | 156.1 | 199.9 | 118.9 |
| Other Meat | 75.1 | 77.2 | 79.8 | 78.2 | 80.2 | 90.3 | 90.5 | 91.3 | 96.6 | 101.9 | 100.0 | 110.2 | 134.4 | 143.2 | 138.6 | 84.6 |
| Poultry | 91.8 | 93.9 | 96.3 | 91.8 | 94.4 | 101.9 | 97.9 | 100.7 | 100.2 | 97.9 | 100.0 | 114.4 | 150.8 | 171.1 | 185.9 | 102.5 |
| Chicken | 89.4 | 92.9 | 95.8 | 90.2 | 93.7 | 102.1 | 97.5 | 99.0 | 99.4 | 96.2 | 100.0 | 115.2 | 151.1 | 171.0 | 188.7 | 111.1 |
| Turkey | 104.3 | 98.8 | 87.9 | 99.7 | 97.1 | 99.7 | 95.2 | 96.9 | 106.0 | 103.4 | 100.0 | 110.0 | 146.5 | 167.3 | 172.8 | 65.7 |
| Fish | 63.7 | 65.3 | 66.8 | 67.5 | 70.7 | 77.7 | 70.2 | 80.9 | 86.6 | 95.9 | 100.0 | 115.0 | 141.6 | 175.7 | 181.8 | 185.4 |
| Eggs | 114.4 | 108.3 | 118.7 | 103.1 | 110.4 | 130.3 | 110.0 | 113.2 | 125.8 | 113.3 | 100.0 | 108.4 | 156.2 | 173.1 | 172.0 | 50.3 |
| Plant Products | 79.1 | 80.5 | 88.9 | 91.1 | 89.5 | 89.7 | 90.0 | 94.6 | 95.4 | 97.6 | | 107.4 | 120.1 | 164.0 | 179.0 | 126.3 |
| Cereal & Bakery Products | 78.7 | 80.5 | 84.3 | 88.3 | 88.8 | 91.1 | 92.5 | 94.5 | 95.7 | 97.8 | 100.0 | 103.4 | 113.3 | 140.8 | 166.4 | 111.4 |
| Fats and Oils | 88.8 | 87.3 | 85.6 | 87.9 | 96.0 | 100.5 | 98.5 | 95.0 | 93.7 | 98.2 | 100.0 | 101.1 | 106.4 | 155.3 | 185.4 | 108.8 |
| Total Fruits & Vegetables | 76.7 | 79.6 | 84.0 | 86.6 | 89.5 | 89.7 | 89.1 | 98.2 | 96.0 | 97.2 | 100.0 | 107.2 | 127.7 | 145.2 | 157.3 | 105.1 |
| Fresh fruits | 75.4 | 77.0 | 83.7 | 82.0 | 80.0 | 78.7 | 82.0 | 95.9 | 88.5 | 87.4 | 100.0 | 107.9 | 132.3 | 149.7 | 155.9 | 106.8 |
| Processed fruits | 81.5 | 80.7 | 88.0 | 94.3 | 92.0 | 92.5 | 91.3 | 97.8 | 102.4 | 102.3 | 100.0 | 104.0 | 116.0 | 137.9 | 153.2 | 88.0 |
| Fresh vegetables | 74.1 | 81.3 | 83.4 | 87.7 | 97.8 | 97.7 | 93.3 | 99.7 | 98.5 | 102.5 | 100.0 | 108.9 | 133.7 | 145.2 | 151.7 | 104.7 |
| Processed vegetables | 81.1 | 80.8 | 81.6 | 87.3 | 90.3 | 94.0 | 96.6 | 100.8 | 101.7 | 102.8 | 100.0 | 104.4 | 114.1 | 138.2 | 169.0 | 108.4 |
| Sugar | 78.8 | 78.5 | 129.1 | 116.2 | 81.1 | 72.5 | 76.9 | 77.7 | 89.0 | 92.3 | 100.0 | 126.0 | 130.7 | 339.2 | 320.6 | 306.9 |
| Beverages | 77.0 | 78.5 | 80.3 | 89.9 | 90.1 | 90.2 | 90.5 | 91.9 | 92.9 | 98.1 | 100.0 | 103.9 | 106.6 | 124.6 | 151.7 | 97.0 |

[a] Up to 1972, CPI for fats and oils includes lard.

Source: Statistics Canada, Cat. 62-002.

nutrients that were judged to be occasionally deficient were folate (a member of the vitamin B complex group) and iron.

The survey indicated that enrichment of cereal products has not prevented iron deficiency probably because of the low bio-availability of the added iron, i.e., the body cannot adequately utilize the iron from the form in which it is added to cereals. It is expected that minimum specifications will be set for the bio-availability of the added iron in the near future.

Another major problem identified was that of obesity among 40 percent of the adults. The cause of obesity can be associated with the increasingly sedentary lifestyle of Canadians and labour-saving devices. Because lower levels of activity mean fewer calories are required while the need for minerals and vitamins remains the same, and because processing tends to reduce the vitamin and mineral content of foods, more of these may need to be fortified in the future.

The study also concluded that 10-13 percent of adult men and 14-34 percent of adult women were in the 'at risk' category for heart disease. While cholesterol levels are regulated by more than dietary factors, overall reduction in consumption of total calories by most Canadians would seem prudent.

## 7.5 PROJECTED CONSUMPTION AND NUTRITION ESTIMATES

Projection estimates for 1986 indicate that total quantity of food consumed on a per-capita basis will not vary significantly from that consumed in the 1972-74 base period. There are indications however that the composition of the food basket will change.

Except for pork, the per-capita consumption of all red meats is expected to increase more than 20 percent by 1986 (Table 7.4 and 7.5). This implies an increase in animal fat, iron and protein in the average diet. However, the projected increase in red meat consumption may be somewhat offset by the concern of the population over heart disease and overeating, and the trend towards vegetarianism or reduction of meat in the diet. The consumption of fish in 1986 is expected to be relatively unchanged at 5.9 kilograms and that of eggs at 11.9 kilograms. Among dairy products, cheeses, especially imported cheese, are expected to take the lead in percent increase in consumption. Consumption of skim milk and butter are expected to fall nearly 46 percent and 39 percent, respectively, below their 1972-74 level.

The net effect is expected to be a decrease of 24 percent in the consumption of dairy products. This reduction in the level of dairy products consumed, especially fluid milk, will result in a lowering of the intakes of calcium, a mineral not available from other foods in significant amounts. Vitamins A and D will be somewhat reduced. Although dairy products are

Table 7.4 AGGREGATE DEMAND FOR FOOD, CANADA, SELECTED YEARS, 1961 TO (1986)

| Item | Measure | 1961 | Average 1972-74 | 1974 | 1981 | 1986 |
|---|---|---|---|---|---|---|
| | | | - million kilograms - | | | |
| Cereals | retail weight | 1261.5 | 1533.9 | 1567.1 | 1703.7 | 1825.0 |
| Sugar and Syrups | retail weight | 819.1 | 1105.4 | 973.8 | 1261.7 | 1369.6 |
| Sugar | retail weight | 741.2 | 1009.9 | 937.0 | 1151.7 | 1250.1 |
| Pulses and Nuts | retail weight | 137.0 | 184.0 | 209.0 | 187,7 | 191.6 |
| Fats and Oils | | | | | | |
| Margarine | retail weight | 83.1 | 101.4 | 109.4 | 115.5 | 124.2 |
| Lard | retail weight | 70.5 | 73.1 | 76.5 | 65.5 | 65.1 |
| Shortening and shortening oils | retail weight | 76.9 | 171.4 | 173.8 | 222.1 | 157.8 |
| Salad Oils | retail weight | 26.7 | 71.5 | 77.8 | 95.5 | 111.1 |
| Fruits | fresh | 1431.7 | 1967.0 | 1976.6 | 2269.0 | 2479.1 |
| Vegetables - excluding tomatoes, potatoes, mushrooms | equivalent weight | 945.1 | 1189.2 | 1272.8 | 1100.0 | 1424.1 |
| Tomatoes | weight | 485.8 | 630.0 | 661.0 | 751.9 | 837.4 |
| Potatoes | Weight | 1226.5 | 1565.2 | 1554.7 | 1777.1 | 1923.1 |
| Meat | carcass weight | | | | | |
| Beef | carcass weight | 584.9 | 935.6 | 966.4 | 1176.2 | 1347.1 |
| Veal | carcass weight | 56.4 | 34.0 | 35.5 | 83.3 | 84.0 |
| Mutton and lamb | carcass weight | 29.0 | 36.6 | 25.9 | 47.7 | 55.5 |
| Pork | carcass weight | 417.0 | 598.0 | 610.4 | 684.1 | 745.1 |
| Poultry | eviscerated weight | 257.2 | 462.7 | 463.9 | 530.9 | 580.0 |
| Chicken | eviscerated weight | - | 319.1 | 316.3 | 366.5 | 400.0 |
| Turkey | eviscerated weight | 63.0 | 104.3 | 107.4 | 121.1 | 132.5 |
| Fish | edible weight | 101.9 | 125.6 | 120.5 | 143.3 | 153.7 |
| Eggs | fresh equivalent weight | 281.1 | 296.4 | 290.8 | 305.4 | 309.9 |
| Dairy Products | retail weight | 3321.8 | 3441.8 | 3484.2 | 3476.4 | 3488.0 |
| Creamery butter | retail weight | 130.8 | 136.3 | 131.9 | 115.1 | 98.1 |
| Cheddar cheese | retail weight | 23.9 | 45.7 | 46.9 | 72.2 | 91.1 |
| Process cheese | retail weight | 26.1 | 55.1 | 58.1 | 71.1 | 82.8 |
| Other Cheese | retail weight | 11.7 | 45.1 | 57.8 | 80.0 | 105.2 |
| Cottage cheese | retail weight | 10.9 | 23.3 | 23.1 | 27.7 | 30.7 |
| Powdered skim milk | retail weight | 69.6 | 52.2 | 57.8 | 41.1 | 33.1 |
| Concen. whole milk products | retail weight | 158.6 | 123.3 | 117.3 | 101.1 | 84.0 |
| Concen. milk by-products | retail weight | 91.0 | 102.6 | 108.5 | 121.1 | 133.6 |
| Fluid milk | retail weight | 2755.1 | 2753.5 | 2784.3 | 2679.0 | 2611.5 |
| Dairy Products | retail weight | 7177.7 | 8086.8 | 8153.4 | 8514.4 | 8786.7 |
| Beverages | retail weight | 118.6 | 154.2 | 154.1 | 177.7 | 194.0 |

[a]Includes chicken, turkey, fowl, duck and goose.

Source: Economics Branch, Agriculture Canada.

Table 7.5 PROJECTED PER-CAPITA FOOD CONSUMPTION, CANADA, 1981 and 1986

| Item | Measure | 1981 | 1981 as a percent of 1972-74 | 1986 | 1986 as a percent of 1972-74 |
|---|---|---|---|---|---|
| | | - kilograms - | | | |
| Cereals | retail weight | 69.7 | 45.7 | 70.1 | 46.0 |
| Sugar and Syrups | retail weight | 51.6 | 47.0 | 52.6 | 47.9 |
| Sugar | retail weight | 47.1 | 47.0 | 48.1 | 47.8 |
| Pulses and Nuts | retail weight | 7.7 | 41.8 | 7.4 | 40.3 |
| Fats and Oils | | | | | |
| Margarine | retail weight | 4.7 | 46.9 | 4.8 | 47.4 |
| Lard | retail weight | 2.7 | 40.2 | 2.5 | 37.5 |
| Shortening and shortening oils | retail weight | 9.1 | 53.4 | 9.9 | 58.1 |
| Salad Oils | retail weight | 3.9 | 55.0 | 4.3 | 60.1 |
| Fruits | fresh | 92.9 | 47.5 | 95.3 | 48.7 |
| Vegetables - excluding tomatoes, potatoes, mushrooms | equivalent weight | 54.3 | 46.0 | 54.7 | 46.4 |
| Tomatoes | weight | 30.8 | 49.1 | 32.2 | 51.4 |
| Potatoes | weight | 72.7 | 46.7 | 73.9 | 47.5 |
| Meat | carcass weight | | | | |
| Beef | carcass weight | 48.1 | 51.9 | 51.8 | 55.6 |
| Veal | carcass weight | 3.0 | 51.8 | 3.2 | 55.7 |
| Mutton and lamb | carcass weight | 2.0 | 53.5 | 2.1 | 58.5 |
| Pork | carcass weight | 38.0 | 47.1 | 28.6 | 48.1 |
| Poultry | eviscerated weight | 21.7 | 47.3 | 22.3 | 48.5 |
| Chicken | eviscerated weight | 15.0 | 47.3 | 15.4 | 48.4 |
| Turkey | eviscerated weight | 5.0 | 47.8 | 5.1 | 49.1 |
| Fish | edible weight | 5.9 | 46.9 | 5.9 | 47.3 |
| Eggs | fresh equivalent weight | 12.5 | 42.4 | 11.9 | 40.4 |
| Dairy Products | retail weight | 142.3 | 41.6 | 135.1 | 39.2 |
| Creamery butter | retail weight | 4.7 | 34.7 | 3.8 | 27.8 |
| Cheddar cheese | retail weight | 3.0 | 65.0 | 3.5 | 76.9 |
| Process cheese | retail weight | 2.9 | 53.2 | 3.2 | 58.2 |
| Other cheese | retail weight | 3.3 | 73.0 | 4.1 | 90.3 |
| Cottage cheese | retail weight | 1.1 | 49.0 | 1.2 | 51.0 |
| Powdered skim milk | retail weight | 1.7 | 32.4 | 1.3 | 24.5 |
| Concen. whole milk products | retail weight | 4.1 | 33.7 | 3.2 | 26.3 |
| Concen. milk by-products | retail weight | 5.0 | 48.5 | 5.1 | 50.3 |
| Fluid milk | retail weight | 109.6 | 40.0 | 100.4 | 36.6 |
| Dairy Products | milk equivalent | 348.5 | 43.3 | 337.7 | 42.0 |
| Beverages | tea leaf and green bean equivalent | 9.3 | 47.5 | 7.5 | 48.6 |

[a]Includes chicken, turkey, fowl, duck and goose.

Source: Economics Branch, Agriculture Canada.

the largest contributing group for riboflavin, some of the loss in decreased consumption will be made up by enrichment of cereal products.

Per-capita consumption of both fruits and vegetables is projected to increase through 1986. The increases are expected to be slight for vegetables and higher for fruits. This trend is encouraging as it implies increases in the average intakes of vitamins, minerals and fibre with little increase in caloric level. Except for lard, the components of the fats and oils group are projected to be consumed in larger quantities in 1981 and 1986. If this holds true, there will be a shift towards more fat in the diet and less protein and carbohydrate. For every 10 gram fat increase in the diet, there must be a decrease of 22.5 gram from carbohydrates and/or proteins in order to keep the caloric intake constant. Thus protein and carbohydrates are reduced in much greater amounts than the increase in fat.

Little or no change is expected for cereals and sugar and syrups, but eventually, increased consumption of meats, fats and oils will affect these.

From the health standpoint, obesity and coronary heart disease being the most serious diet-related problems, the greatest nutritional concern of the years to come will be the increased consumption of fats and the inevitable decreased intake of carbohydrate foods, particularly cereals.

## 8. GOVERNMENT SERVICES FOR AGRICULTURE - HIGHLIGHTS

1975

1. Agriculture and food research has been one of the dominant research activities in Canada. Agriculture Canada conducts over 50 percent of the work in this field, contracting out when necessary. Its 47 research establishments located from coast to coast concentrate mostly on long-term national and regional programs that have broad implications. The provincial governmental efforts in research are in response to local needs and vary from region to region. The National Research Council also investigates some problems of interest to agriculture. Industry conducts very little research. The total annual cost of supporting agricultural research in Canada is estimated at $175 million, two-thirds of which is assumed by Agriculture Canada.

2. The provinces have carried the largest share of extension but their individual involvement has been uneven. Recent years have seen many new programs, more intensive service to farm families, some organizational changes and altered guidelines for clientele. The federal government's main role in extension and information has been in appraising the whole system and in providing support in the weakest areas.

3. Almost 60 percent of Canadian farmers have less than nine years of schooling. Education being a provincial responsibility, the federal government's involvement has been mainly in offering agricultural courses to farmers through the Canada Manpower Training Program, and in providing operating grants to universities and agricultural colleges. Enrollment has been increasing annually at the seven universities and four provincial colleges offering courses in agriculture and veterinary medicine.

4. Federal and provincial efforts in the production and marketing areas are generally complementary and are intended to assist agricultural producers in realizing from the market a fair return for management, capital and labor. The implications of this are far reaching, Agriculture Canada alone administers 26 pieces of federal legislation with the allocation of some 2200 man-years annually, and has an operating budget of $34.8 million (1975-76).

# 8. GOVERNMENT SERVICES FOR AGRICULTURE

## 8.1 RESEARCH SERVICES

During the past ninety years, and especially during the past thirty, Canada has built a strong competence in research, aimed at alleviating current and anticipated agricultural problems in the many soil and climatic zones of Canada. Agriculture & food research has been one of the dominant research activities in the country.

Current research programs are designed to determine the optimum conditions of soil and climate for specific types of crop and animal production; to create new and improved varieties of crops and animals; to reduce losses caused by diseases, weeds and insects; to improve crop and animal management techniques through biological and engineering research; and to develop new and improved methods for the preparation and preservation of food.

### 8.1.1 Federal Research

Agriculture Canada conducts over 50 percent of the agricultural research in Canada (Table 8.1).

Agriculture Canada's budget allocated to research is approximately $116,000,000. This supports the research program of the Research Branch ($106,000,000), the Economics Branch ($2,000,000), the Health of Animals Branch ($4,000,000), the Canadian Grain Commission ($2,000,000) and the Departmental Library ($2,000,000).

The Research Branch is responsible for 47 research establishments of varying size and degree of specialization, located from coast to coast. Its program concerns all facets of agricultural endeavour as it pertains to plant and animal production and protection, land classification and use, and environmental quality. Its staff comprises 3,700 people of whom 888 are scientists.

The program of the Research Branch is organized on the basis of national objectives which are related to those of the department and the government. Each Branch objective is supported by a number of specific goals. The activities under a Branch goal comprise a Branch program. Station goals relate to Branch goals, and each is supported by a number of specific projects.

The Economics Branch conducts research on the behavior and interrelationships of economic and social variables affecting the agricultural industry, with particular emphasis on issues pertaining to policy development and implementation. Sixty professional man-years in the Economics Branch are allocated to research, 13 of which are located at research stations of the Research Branch to interact with biological scientists in

Table 8.1 AGRICULTURAL RESEARCH PROGRAM INVENTORY, CANADA, 1971[a]

| PROGRAMS | FUNCTIONS (Professional man-years) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PRODUCTION | | | | PROTECTION | | | | UTILIZATION | SERVICES | | | TOTAL | RESEARCH BRANCH PERCENTAGE OF NATIONAL PROGRAM |
| | Breeding | Management | Physiology | Soils | Nutrition | Diseases | Insects | Weeds | Food | Engineering | Statistics | Economics | | |
| COMMODITY PROGRAMS | | | | | | | | | | | | | | |
| Plants | | | | | | | | | | | | | | |
| Forage crops | 16.6 | 20.5 | 16.3 | 30.3 | - | 13.2 | 12.7 | 8.6 | 0.1 | 6.5 | 1.3 | 9.9 | 147.0 | 62 |
| Oilseed crops | 12.6 | 2.7 | 7.5 | 3.8 | - | 7.8 | 17.3 | 8.3 | 14.9 | 9.7 | 1.3 | 8.6 | 94.5 | 53 |
| Horticultural crops | 42.1 | 34.5 | 25.8 | 24.0 | - | 66.8 | 71.6 | 18.3 | 25.8 | 8.8 | 2.5 | 20.7 | 340.9 | 63 |
| Cereal crops | 67.7 | 10.4 | 21.0 | 29.0 | - | 35.4 | 25.7 | 25.0 | 24.0 | 25.0 | 3.2 | 8.7 | 285.1 | 61 |
| Field crops | 10.9 | 6.5 | 5.6 | 2.3 | - | 6.5 | 2.7 | 11.2 | 8.0 | 0.4 | 0.9 | 3.5 | 58.5 | 56 |
| TOTALS(Plants) | 159.9 | 74.6 | 76.2 | 99.4 | - | 129.7 | 131.0 | 71.4 | 72.8 | 50.4 | 9.2 | 51.4 | 926.0 | 61 |
| Animals | | | | | | | | | | | | | | |
| Beef | 8.5 | 17.8 | 18.9 | - | 16.9 | 36.9 | 14.2 | - | 15.7 | 6.9 | 0.7 | 20.6 | 157.1 | 42 |
| Dairy | 9.6 | 0.5 | 9.5 | - | 13.0 | 22.7 | 1.7 | - | 18.5 | 7.0 | 0.4 | 17.3 | 101.1 | 26 |
| Swine | 6.5 | 0.7 | 10.2 | - | 13.3 | 13.6 | 0.0 | - | 3.6 | 3.5 | 0.3 | 6.5 | 58.2 | 20 |
| Poultry | 15.8 | 7.7 | 6.2 | - | 19.7 | 14.1 | 0.0 | - | 3.1 | 3.1 | 0.7 | 1.5 | 71.9 | 25 |
| Sheep & furbearers | 2.5 | 1.7 | 3.9 | - | 6.6 | 20.3 | 0.1 | - | 0.4 | 0.1 | 1.1 | 2.3 | 39.0 | 22 |
| Bees | 0.0 | 3.0 | 2.0 | - | 0.0 | 1.5 | 0.0 | - | 0.0 | 0.0 | 0.0 | 0.2 | 6.7 | 45 |
| TOTALS(Animals) | 42.9 | 31.4 | 50.7 | - | 69.5 | 109.1 | 16.0 | - | 41.3 | 21.5 | 3.2 | 48.4 | 434.0 | 31 |
| RESOURCE PROGRAMS | | | | | | | | | | | | | | |
| Biosystematics | 26.6 | - | - | - | - | 25.3 | 54.1 | - | - | - | - | - | 106.0 | 57 |
| Soilsurvey | - | - | - | 87.0 | - | - | - | - | - | - | - | - | 87.0 | 51 |
| Environmental quality | - | 10.1 | 1.3 | 20.3 | - | 1.2 | 12.3 | 2.7 | - | 9.1 | - | - | 57.0 | 39 |
| GRAND TOTALS | 229.4 | 116.1 | 128.2 | 206.7 | 60.5 | 265.3 | 213.4 | 74.1 | 114.1 | 81.0 | 12.4 | 99.8 | 1610.0 | 51 |

[a]Non Research Branch figures based on CASCC Survey (1971) adjusted where necessary and estimated for industry.

planning and carrying out investigations where a combined effort of the two diciplines is imperative.

Research on animal diseases is carried on by the Animal Pathology Division of the Health of Animals Branch at Ottawa and at eight regional laboratories. Some 40 scientists are engaged in research directed mainly at diseases that cause serious economic losses of livestock and those that may be transmitted to man. The Division studies the causative agents of animal diseases and their methods of transmission, and is constantly developing and improving tests for detecting disease. It also produces diagnostic reagents and biological products to halt outbreaks of disease. Tests are developed to qualify breeding livestock, embryos, semen and meats for export and to protect against the entry of foreign animal diseases into Canada. By collaboration and contracts, the Division supports research in other veterinary agencies in Canada designed for the control and eradication of livestock disease.

The Grain Research Laboratory at Winnipeg, under the Canadian Grain Commission, conducts research on grain quality. There are 16 scientists on staff. The program includes monitoring and assessment of the quality of cereal grains and oilseeds grown and marketed in Canada, together with applied and basic research on quality as related to end use of these crops.

The Departmental Library located in Ottawa but with branch units at all research stations, provides a distribution, circulation, loan and photocopy service of the world scientific literature to all establishments in the Department.

In some regions, Agriculture Canada is responsible for the main research effort, e.g., most of the cereal breeding on the Great Plains, all the tobacco research in Ontario, and all research in the Atlantic region. In some cases, the federal programs only attempt to meet those research needs not being handled by others; in other cases, federal programs are designed to take a long-term view on a promising but uncertain venture, such as was the case, years ago, when plans were laid to develop a rapeseed crop for the prairies.

### 8.1.2 Provincial and Unviversity Research

It is estimated that approximately 520 full-time professional man-years are devoted to research in the eleven faculties of agriculture, and conduct about 30 percent of the national program. The provincial government efforts in research vary from region to region. In the Atlantic Provinces, all research is done in federal stations; the Quebec department maintains several research stations and supports university programs through grants; in Ontario, the Ministry of Agriculture and Food contracts a large research program with the University of Guelph and conducts its own research at provincial stations and institutions of agricultural technology; provincial support in Manitoba and Saskatchewan is funneled through the universities;

in Alberta, one provincial research station is in operation but most provincial research support goes to the university; in British Columbia, research is done by the federal stations, although there are some federal-provincial shared programs, mainly in the area of development.

As provincial departments assume responsibility for research of particular interest to a province, it enables Agriculture Canada to place more emphasis on long-term national and regional agricultural programs that have broad implications.

### 8.1.3 Industry Research

Industry, in the agribusiness sector, conducts very little research. Until recently, practically the only research pertaining to agricultural production was in the development of corn hybrids. At present, mainly through the Industrial Research Assistance Program of the National Research Council, four seed companies are now conducting research associated with the production of new varieties of crops. About 15 companies in other areas of agricultural endeavour have grown in research competence to the point where Agriculture Canada contracts some research with them. Also, the Ministry of State for Science and Technology's "Make or Buy" policy (1972) promotes the contracting out of research work wherever possible, particularly to industry.

It is estimated that, in Canadian industry, about 100 scientists are conducting research on agricultural problems involving engineering, plant breeding, soil fertility, weed control, animal breeding and nutrition, health of animals and food research.

### 8.1.4 National Research Council

The National Research Council at its small group of laboratories, has 31 scientists in multi-disciplinary research teams, striving to provide answers to many biological problems of direct interest to agriculture. The NRC has also made substantial progress in promoting research in industry, some of it directly involved in agriculture.

The NRC places particular emphasis on effective ways of using its demonstrated capability to pursue long-term research, directed towards problems of on-going national concern. Its programs on food research, nitrogen fixation and environmental quality are of special interest to agriculture. Its support of research in universities, and its relations with provincial research councils and foundations, are important parts of Canada's total range of research services.

### 8.1.5 Contract Research

Agriculture Canada currently expends $3 million on contract research. This covers meats research, engineering,

reproductive physiology of animals, milk products, swine, biosystematics and economics. The amount will grow as research facilities become available in industry and as more contracts are arranged with universities.

However, there are sound reasons why Agriculture Canada must conduct a large part of its own program 'in-house'. Agricultural research serves approximately 350,000 individual producers and practically none is in a position to conduct research, even under contract. Furthermore, the number of industrial firms in the agricultural sector, willing or able to do research under contract, is very few indeed. In spite of this, during the past three years, contracts have been arranged with a number of these firms and Agriculture Canada is ready to negotiate contracts with others as they come on the scene. By necessity, most of the contract research is presently located at universities.

### 8.1.6 Status of Canadian Agricultural Research

Table 8.1 gives a breakdown by commodities, resource programs and functions of the effort, in full-time professional man-years, of the 1610 agricultural research scientists in Canada. It has been estimated that the total cost of supporting research for Canadian agriculture is about $175 million per year. (This represents about 1.8 percent of Canada's total gross farm income).

In some areas of endeavour, Canada's future agricultural research effort will require changes and expansion if we are to provide answers to the pressing problems and restraints in agricultural production. During the immediate past, Canadian capability to do this has slipped due to restrictions on staff recruitment and equipment replacement. An example of an area so affected is research on pesticides and toxicology.

The pre-eminence of Canada as an agricultural producing nation depends as much on its scientific competence as on its natural resources.

## 8.2 EXTENSION AND INFORMATION

### 8.2.1 Extension

#### Jurisdiction over Extension

The British North America (BNA) Act (1867) allocates responsibility for agricultural extension to the provinces, and for agricultural research to both federal and provincial governments. In practice, since Confederation, both levels of government have shared the work although the federal department has done the major share of research and the provinces have emphasized their extension role.

Provincial involvement in the extension area has been uneven; the richer provinces of Ontario and Alberta have devoted substantial funds to extension work, while in other provinces, less has been done. Also, the federal government has inevitably been involved in extension work because it is difficult to break the cycle between research, its transfer to the farmer and his application of it. The federal government's main role has perhaps been in the appraisal of the whole extension system, and identification of deficiencies. Where such deficiencies exist, the Canadian Agricultural Services Coordinating Committee (see section 9.1.1) has been able to indicate solutions.

Traditionally, extension has been considered to be a two-way channel between academics and government departments of agriculture on the one side, and the farmer on the other. Feedback from the farmer is valuable to researchers and its importance to policy and program development staffs cannot be over-estimated. Industry often regards extension as a valuable sales promotion tool and can be both a giver and a receiver of extension information (Figure 8.1). It is also important to remember that a progressive farmer (who can communicate his skills to his neighbors) is the most effective of all extension agents.

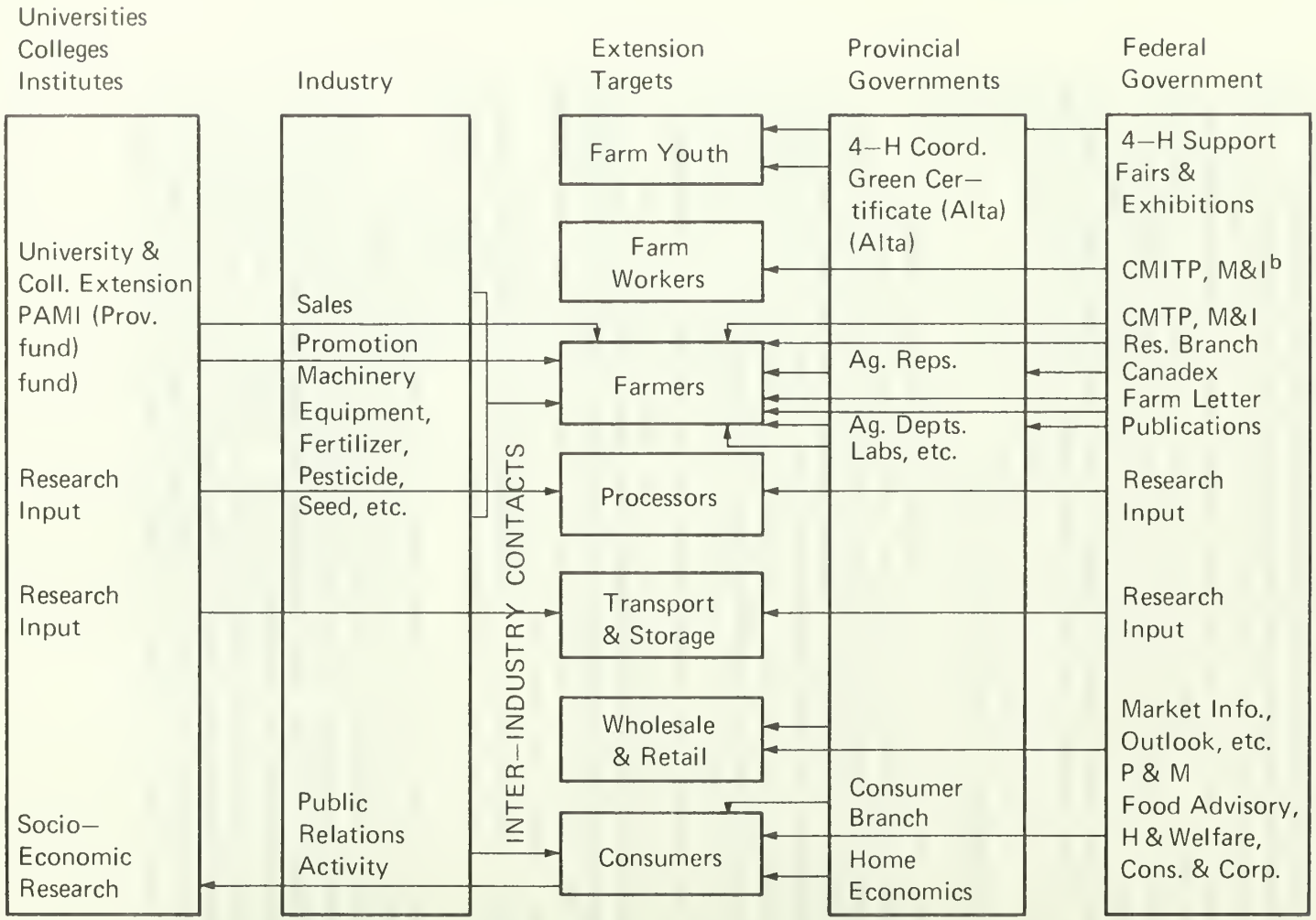
### Provincial Extension Policies

Only moderate broad policy direction is given by most provincial governments, with the exception of the Prairie Provinces. The majority of provinces have seen major changes in government expectations from extension in the past few years. Much of the shift has been in the form of new programs, more intensive service to farm families, some organizational changes, and changing guidelines for clientele.

In the Maritimes, government sets the broad policy framework, much of it in cooperation with, or at least close to, the expectations of major farm organizations. Maritime governments have been pressing extension to reach more commercial farmers, and at the same time, are expressing concern for the low income farmers. There has been some questioning of increasing government expectations for 'administrative' duties, service to a larger clientele and increased programs, with the same staff.

In Ontario, there is no interference by government in the process of setting objectives, priorities and programs - utilizing a management-by-objectives approach which gives all staff the opportunity to contribute to program development. Departmental programs are considered within the policy framework provided by the government. Changes in Ontario's extension program have been mainly in types and levels of service, with emphasis on farm management, rural development and rural society in general, transportation routes, land zoning, municipal planning and others. Ontario has specified

FIGURE 8.1 CANADIAN AGRICULTURAL EXTENSION SYSTEM 1976[a]




a This diagram illustrates the framework in which extension exists. Some examples of extension activity are given. There are many more. In general, the chart illustrates a one–way flow of information; it must be remembered that feedback is also very important.

b Canada Manpower Industrial Training program, Manpower & Immigration.

the clientele they expect their extension workers to serve: commercial farmers, i.e., those who have annual sales of $10,000 or over. Nonetheless, there may be a subtle trend towards helping lower income farmers.

In British Columbia, the government sets the overall policy and the department of Agriculture determines programs to achieve this policy. The same applies in Quebec.

Extension workers in the Prairie Provinces have experienced much greater direction from government by way of new programs and new guidelines, with the expectation that extension workers will change some of their well-established habits, and work with different people. There is a trend towards more intensive service to farmers, and towards the lower-income or new and developing farmers, i.e., towards those who can use it most.

In Manitoba, lower income farmers are now definitely the priority clientele. This conclusion has been reinforced by certain farm programs (farm diversification, agricultural credit and new land lease, new Crown lands policy) and by direct employment programs (Farm PEP, Rural STEP).

In Alberta, the agricultural extension agent has become a credit agent as well as a source of agricultural information. The government has decided that farm credit planning and granting fits well with extension. Because this new activity may take 40 percent of an agent's time, extension workers busy with regular duties therefore have to make a major shift in their work pattern to accommodate the additional load. In Alberta, as well as in Manitoba, where specific additional work has been required, some additional resources have been allocated.

The role of Home Economics in extension has been debated by some provincial governments. Home economists have probably been more successful in reaching low income farmers' families than agricultural extension workers. Extension administrators have been successful in retaining Home Economics by their argument that it permits dealing with the total farm family, and that this is essential.

On the whole, extension programs vary considerably from province to province and from county to county, although the individual agricultural representative probably has less discretion in responding to his perception of local needs than he had a generation ago.

## Federal Involvement in Extension

Federal involvement in extension has tended to produce greater consistency in the standards of service across the country. The wide availability of such services as CANFARM, (the national farm accounts system), Canadex, the Farm Letters,

Agriculture Canada publications, information and laboratory services, together with generally improved communications have made this possible.

Agriculture Canada operates a limited extension program at each experimental farm or research station, with approximately five percent of Research Branch activities devoted to this end. The Production and Marketing, and Economics Branches also have impacts in various sectors of the farm supply or food processing industries, which might be regarded as extension activity. The Small Farms Development Program and Farm Credit Corporation activities also have obvious extension implications.

## Industry Involvement in Extension

The farm supply industry has long seen farm extension as the key to long-term sales development, and is now discovering what to do about it. For example, chartered banks have about 60 fieldmen at work across the country.

Feed, fertilizer and pesticide manufacturers all combine sales and extension functions, and at least one silo manufacturer sells silos complete with silage management programs.

Machinery manufacturers such as John Deere are also making major efforts in the extension area. Such competitive activity is not easily coordinated; nor can one say how much emphasis is on extension and how much is on sales. It is, however, no criticism of the companies to note that the indicator of success that they are concerned with is sales.

## Adequacy of Extension

Although there has been a number of useful innovations in recent years (e.g., CANFARM, the Prairie Agricultural Machinery Institute and Canadex), available extension technology has not always been used to its full potential. Jurisdictional questions have sometimes been at the source of this problem.

There is no way of assessing the adequacy of extension services in Canada except in very generalized terms. Some farmers set little store on it; others pick up extension information and apply it advantageously.

From Agriculture Canada's point of view, the question of adequacy is perhaps best approached through the examination of Canadian farm productivity relative to that of competitors. If production targets are reached, the extension system may be judged adequate, however simplistic such an assessment may appear. The possibility of evaluating an extension service with reference to its role as an instrument of social development may render the final judgement more sophisticated.

Another consideration is that an extension system that may be adequate for promoting a development in the cereal area, may not yield good results in the forage area. It is a fact of life in extension work that there are 'glamor' items, which catch the imagination of the farmer. Conversely, there are equally valuable but less glamorous possibilities which he should be considering, but need some long, hard selling before they are adopted.

It is estimated that agricultural representatives have contact with only 30 percent of the farm population. Agriculture Canada's Farm Letter goes to 317,000 farmers, but it is hard to assess its effectiveness.

### 8.2.2 Information

Agriculture Canada, some of its associated agencies, the provincial departments of agriculture, the universities, colleges, industries, and industry and producer organizations, all have information programs of one sort or another.

They range from a mimeographed annual newsletter at one extreme, to skillfully orchestrated and responsive information services at the other.

The most effective programs make use of factsheets, brochures, periodicals, newsletters, press releases, films, audio-visual presentations, regular radio programs, media and public relations services, exhibitions, advertising, and conferences. Such information programs also try to identify and react to feedback on their organization's activities.

#### Federal Information

Agriculture Canada's information function is carried out primarily by the Information Division. The broad public affairs program is geared to informing the agricultural industry and the public about the policies, programs and activities of the department, including the results of agricultural research. The division has an advisory role in formulating the department's public information needs for existing and proposed policies and programs. As well, it provides assistance to the Farm Credit Corporation and other outside agencies reporting to the department.

While Agriculture Canada's information activity centers on the Information Division, some specialized information functions are carried out by other branches. The Production and Marketing Branch and the Research Branch disseminate markets and prices, and research information, respectively. As well, the Outlook Conference (see section 9.1.4) may be regarded as a vehicle for release of information.

The Minister and his senior officers are also very much involved in the dissemination of information, particularly on national agricultural policies.

Industry Information

As is the case with extension, industry activity in the information area tends to focus on product promotion and sales results. Again, unit sales are often used as the indicator of their programs' success.

Adequacy of Information

Information services vary from the highly efficient to those that are understaffed, under-funded and ineffective. No two provinces have the same organizational structure (Table 8.2). In some departments, the information people operate a clearing house for information. In others, they have the capacity to undertake a great deal of activity without reference to specialists outside their own unit.

Because of these organizational differences, comparisons are of limited value. Alberta, for example, has audio-visual staff with Agriculture's Communications Branch. In Nova Scotia, the corresponding specialists are part of a Communications Information Centre which serves the entire provincial government.

Agriculture Canada provides valuable support in the weakest areas of information services. Canadex leaflets keep agricultural representatives up-to-date on technical and scientific developments. The Farm Letter provides Canadian farmers with essential background information on national agricultural policies and programs. Canada Agriculture is a high quality, quarterly publication that features work done by the department. "The Lighter" reports on tobacco production and research.

The Department also publishes a broad range of technical bulletins, periodicals and other publications, and coordinates its publications program with those of the provinces.

The Canadian Agricultural Publications Titles Listing Service, now being developed, will lead to much better communications between the various information divisions, will tend to eliminate duplication, and will save money by making possible longer printing runs. It will probably be extended eventually to cover the full range of agricultural information resources if the initial project is well supported by the provinces.

### 8.2.3 Costs and Returns of Extension and Information

Provincial ministeries and departments have varying areas of responsibility (Newfoundland and P.E.I. - Forestry and Agriculture; Nova Scotia - Agriculture and Marketing; New

Table 8.2 PROVINCIAL EXTENSION AND INFORMATION STAFF, CANADA, 1976[a]

| PROVINCE | EXTENSION | | INFORMATION | |
|---|---|---|---|---|
| 1974 | Ag.Reps./Asst.Ag.Reps. | Total Prof. Staff | Information Officers | Total Prof. Staff |
| Newfoundland | 12 | 70 | 1 | 1 |
| P.E.I. | 5 | 15 | 2 | 2 |
| Nova Scotia | 14 | 34 | 1 | 1 |
| New Brunswick | 21 | 36 | 1 | 4 |
| Quebec | 85 | 800 | 24 | 75 |
| Ontario | 129 | 200 | 15 | 22 |
| Manitoba | 130 | 175 | 7 | 12 |
| Saskatchewan | 52 | 103 | 2 | 10 |
| Alberta | 90 | 260 | 6 | 14 |
| British Columbia | 22 | 120 | 2 | 6 |
| Agriculture Canada | nil | nil | 32 | 49 |

[a]The figures presented here are estimates and not readily comparable because the organizational structure of each province is different.

Source: Provincial Departments of Agriculture.

Brunswick - Agriculture and Rural Development; Ontario - Agriculture and Food). Because they are organized differently, they tend to break down their budgets in different ways. It would thus be difficult and possibly meaningless to produce consolidated figures for individual provincial expenditures on extension or information. Inclusion of the industry figures would be doubly difficult.

In considering the benefits resulting from extension, it is possible to say that virtually all the positive results arising from the application of improved technology and the adoption of better strains of crops and livestock are the result of extension of one sort or another. This is not to undervalue the achievements of the researchers, but until research is applied through effective extension, it has no actual economic significance. On the other hand, extension, without the backup afforded by the scientists and engineers, has very limited potential.

The division of responsibilities for information dissemination varies among the provincial departments of agriculture, making accurate comparisons for costs and returns difficult. Information's pay-off is to some degree similar to that of extension, but also extends into the program and policy fields.

## 8.3 EDUCATION

### 8.3.1 Education in the Farm Community

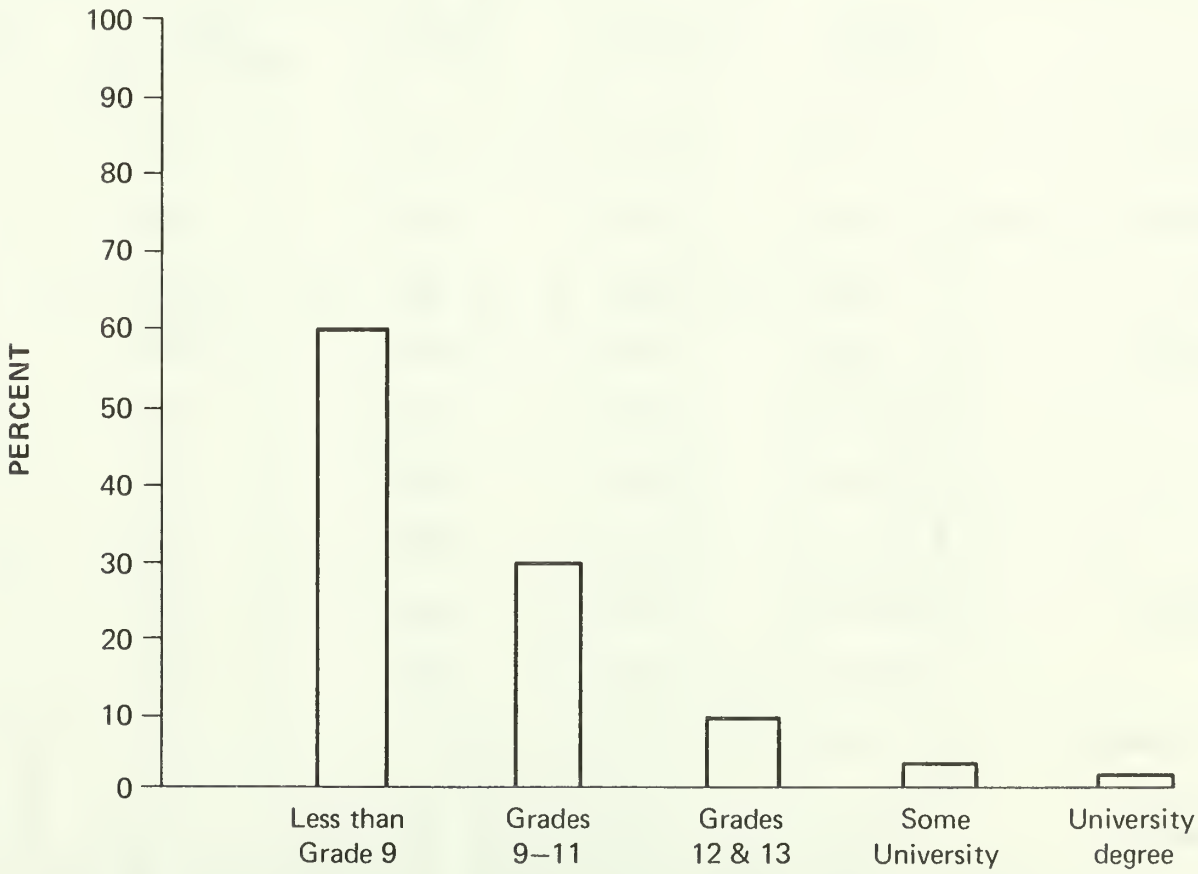
Almost 60 percent (Figure 8.2 and Table 8.3) of Canadian farmers have less than nine years of schooling. This does not necessarily make them inadequate farmers, but it does have important implications for manpower training and information officers.

Whatever the farmer's basic education, the rate of technological change today means that he will need to update his knowledge and skills continually, hence the importance of extension work.

Since the BNA Act identifies education as a provincial responsibility, the federal government's only real involvement at a basic level is in offering agricultural training to farmers through the Canada Manpower Training Program, and to farm workers through the Canada Manpower Industrial Training Plan. None of these courses lasts for more than one year. The scope of these plans is indicated in Table 8.4. Subjects taught include:

- Forage management
- Selection, use and operation of farm machinery
- Advanced sheep production
- Basic farrier training
- Agriculture accountancy and management
- Artificial insemination
- Fruit farm management

FIGURE 8.2 **LEVELS OF SCHOOLING IN THE FARM COMMUNITY, CANADA, 1971**




Source: Statistics Canada, Census of Agriculture, 1971.

Table 8.3 LEVELS OF SCHOOLING IN THE FARM COMMUNITY BY PROVINCE, CANADA, 1971

| | Total Farmers | Less than Grade 9 | Grades 9 - 13 | Some University | University degree |
|---|---|---|---|---|---|
| Newfoundland | 365 | 62% | 36% | 1% | 1% |
| Prince Edward Island | 3,305 | 59% | 38% | 3% | |
| Nova Scotia | 3,025 | 39% | 55% | 5% | 1% |
| New Brunswick | 3,045 | 71% | 26% | 2% | 1% |
| Quebec | 39,470 | 79% | 19% | 1% | |
| Ontario | 59,230 | 59% | 38% | 2% | 1% |
| Manitoba | 27,415 | 60% | 36% | 4% | 1% |
| Saskatchewan | 64,965 | 56% | 40% | 4% | 1% |
| Alberta | 46,750 | 48% | 49% | 2% | 1% |
| British Columbia | 7,825 | 46% | 47% | 5% | 2% |
| (statistical discrepancy) | (20) | | | | |
| Canada | 255,145 | 59% | 38% | 3% | 1% |

Source: Statistics Canada, Census of Agriculture, 1971.

Table 8.4 CANADA MANPOWER TRAINING PROGRAM, NUMBER OF FULL-TIME PLACES PURCHASED IN AGRICULTURAL COURSES, 1972-1976 Average

| PROVINCE/REGION | FIVE-YEAR AVERAGE | CANADA COST 1975-76 |
|---|---|---|
| Newfoundland | 77 | $ 26,526 |
| Prince Edward Island | 695 | 137,258 |
| Nova Scotia | 334 | 121,686 |
| New Brunswick | 519 | 57,559 |
| ATLANTIC | 1,624 | 343,029 |
| Quebec | 11,611 | 378,264 |
| Ontario | 269 | 261,294 |
| Manitoba | 794 | 10,625 |
| Saskatchewan | 1,245 | 79,077 |
| Alberta | 1,059 | 63,594 |
| PRAIRIES | 3,098 | 153,296 |
| British Columbia | 320 | 144,791 |
| CANADA | 16,921 | $1,280,674 |

Source: B050/1, Manpower Training Branch, Programs Analysis Division, August 1976.

Individualized instruction programs using performance-based training systems are being developed. The most familiar system is DACUM (Developing a Curriculum). The goal is a flexible training system, relevant to the individual's needs and not duplicating his existing knowledge, which does not involve the high cost per student normally associated with small class situations.

### 8.3.2 Advanced Education

Advanced courses in agriculture and veterinary medicine are available at a number of Canadian universities. Provincial agricultural colleges in Alberta, Ontario, Quebec and Nova Scotia also make useful contributions at the immediate post-secondary level. In addition, many community colleges have courses related to agriculture.

Seven Canadian universities have faculties of agriculture. These offer courses towards undergraduate and graduate degrees in most agricultural disciplines, e.g., agricultural economics, agricultural engineering, animal and poultry sciences, agrometeorology, agricultural entomology, crop and soil sciences, food science, and landscape architecture.

The Western College of Veterinary Medicine of the University of Saskatchewan (Saskatoon), the Ontario Veterinary College at the University of Guelph and the Faculté de Médécine Vétérinaire (Université de Montréal at St-Hyacinthe, Quebec), offer undergraduate and graduate programs in veterinary medicine.

Enrollment in courses of agriculture and veterinary medicine have been increasing annually (Table 8.5 and Figure 8.3) in response to the need for trained personnel in government and industry. As well, an increasing number of university and college graduates are using the knowledge acquired at the post-secondary level in their own farming operations.

The greatest deficiencies in advanced agricultural education are the areas of toxicology, plant breeding, farm management and agronomy. Canadian universities are not training or developing enough people who can function effectively in the area of international technology transfer. As a result, there are not many graduates qualified to play a role in Canada's international development program.

### 8.3.3 Resources for Advanced Training and Budget Adequacy

The uncertainties of university funding may be a deterrent in some faculties, preventing some graduates with potential from continuing to the post-graduate level. In addition to the general shortage of funds, the problem is one of limited and fluctuating year-to-year allocation that hinders intelligent planning.

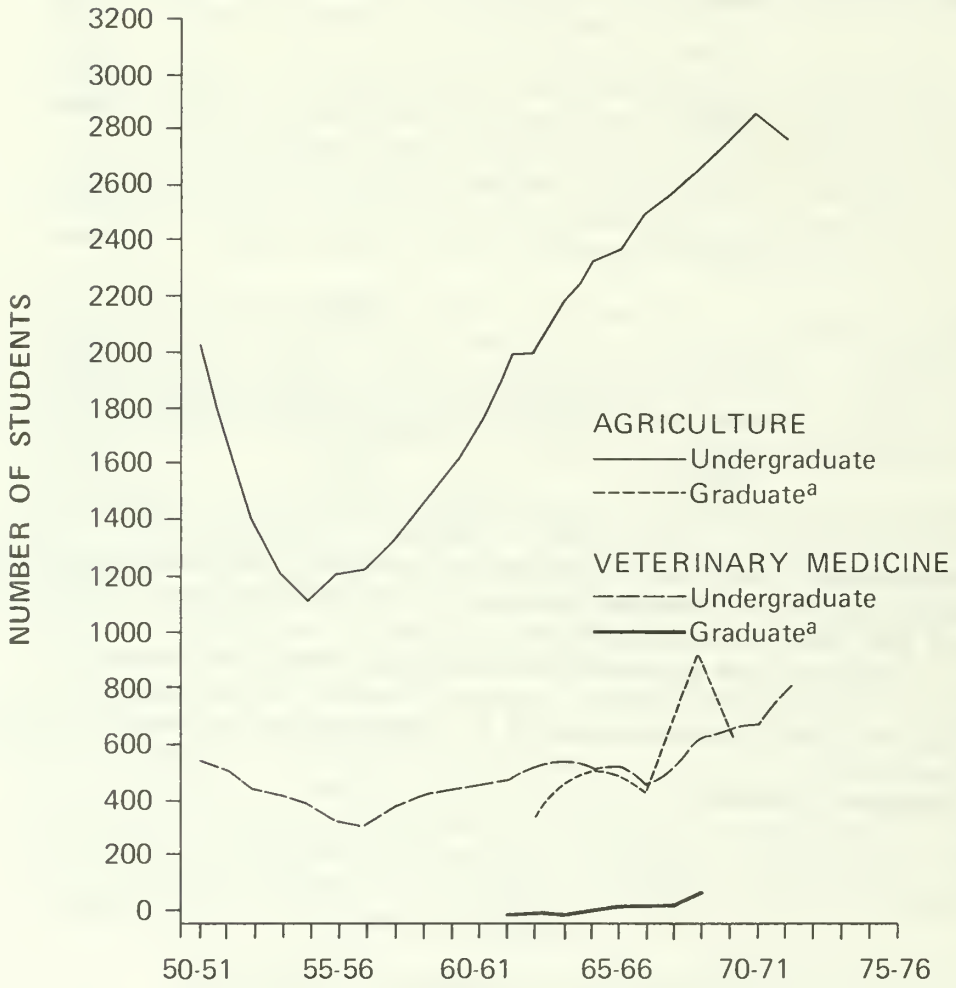
Table 8.5 FULL-TIME UNIVERSITY AND COLLEGE ENROLLMENT BY PROVINCE, CANADA, 1975/76

| University | Undergraduate Agriculture | Undergraduate Veterinary Medicine | Graduate - Agriculture & Biological Sciences Masters | Graduate - Agriculture & Biological Sciences Doctorates |
|---|---|---|---|---|
| British Columbia | 341 | - | 186 | 153 |
| Alberta | 547 | - | 185 | 76 |
| Saskatchewan[a] | 380 | 254 | 88 | 47 |
| Manitoba | 489 | - | 188 | 107 |
| Guelph[b] | 1196 | 473 | 287 | 100 |
| Laval | 470 | - | 131 | 24 |
| McGill[c] | 262 | - | 190 | 103 |
| Montreal[d] | 1 | 266 | 32 | 4 |
| Others[e] | - | - | 283 | 49 |
| Total | 3685 | 933 | 1570 | 963 |

[a]Western College of Veterinary Medicine is a faculty of University of Saskatchewan.
[b]Ontario Agricultural College and Ontario Veterinary College are constituent colleges of the University of Guelph.
[c]Macdonald College is the agricultural college of McGill University.
[d]University of Montreal veterinary faculty located at St-Hyacinthe.
[e]Universities offering studies related to agriculture and veterinary medicine.

Source: Statistics Canada.

FIGURE 8.3 **TRENDS IN FULL–TIME ENROLLMENT, AGRICULTURE AND VETERINARY MEDICINE, CANADA 1950 to 1971**




[a]Data incomplete

Source: Statistics Canada

As a general rule, the more money available for scientific training, the better that training will be. This reduces the question of budget adequacy to one of priorities.

## Relation to Research

Agriculture Canada's limited funding of research at colleges and universities is generally in support of the training of graduate students, and has implications in the promotion of agriculture among the new generation of scientists. In addition, some graduate students are also involved in research at federal establishments, there are many cooperative research programs, and a number of Agriculture Canada scientists lecture at colleges and universities or assist in the supervision of graduate student theses.

## Agriculture Canada Operating Grants

A program of grants-in-aid of agricultural research at universities was recommended by the Canadian Agricultural Services Coordinating Committee, proposed by Agriculture Canada, and authorized by Treasury Board in 1965. The objective was to supplement those awarded by the NRC for biological and chemical research in agricultural faculties.

For the academic year 1976-77, a total of $890,000, an increase of $340,000 over the previous year, was made available for grants to applicants at universities and colleges. Selection is made by the Operating Grants Committee composed of three representatives of Agriculture Canada and seven representatives of faculties of agriculture and veterinary science. The grants are administered by the Research Branch.

In addition, each of the ten deans of agricultural and veterinary science, and, beginning this year, the principal of the Nova Scotia Agricultural College, receives an annual grant of $10,000 for distribution among members of his faculty. In the past year, they supported the following activities:

| | | |
|---|---|---|
| Animal Production | : | 6 projects |
| Animal diseases | : | 19 projects |
| Crop production | : | 7 projects |
| Crop protection | : | 3 projects |
| Crop products | : | 2 projects |
| Economics | : | 3 projects |
| Agricultural pollution | : | 1 project |

It is anticipated that the total Operating Grants program will operate at this same level ($1,000,000) in 1977-78.

Grants-in-aid of research at universities include $327,000 to obtain research that the Department requires in order to attain its objectives, but for which it does not have the necessary expertise or facilities. The Canadian Agricultural Services Coordinating Committee is informed of these grants because of the committee's involvement in resource allocation.

Departmental managers apply for grants to be awarded to a scientist or engineer at a university, college or provincial research council, who will undertake the required Research and Development. The Extra-Mural Research Committee is chaired by the Coordinator (Executive Program), Research Branch, and includes representatives from Agriculture Canada's four other operating branches.

## 8.4 PRODUCTION AND MARKETING

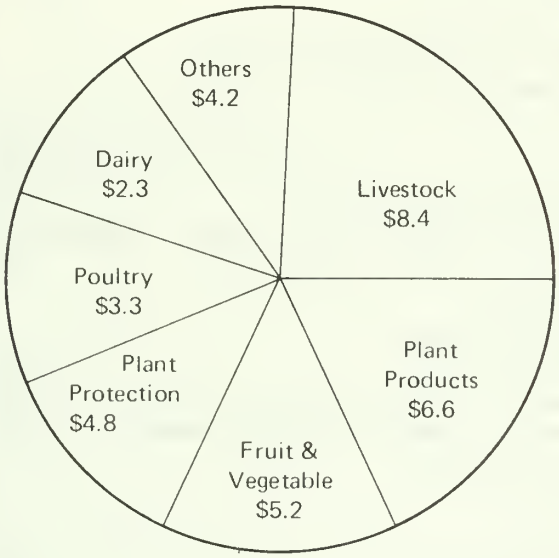
Governmental production and marketing services are intended to assist agricultural producers in realizing from the market a fair return for management, capital and labor. Federal and provincial efforts are generally complementary in seeking to stabilize farm income; to facilitate orderly marketing of farm products; to ensure the quality identification of agricultural products, in the interests of producers and consumers; to provide the opportunity for producers to receive returns relative to quality of produce; to improve the quality and standard of purchased goods essential to agricultural production and related uses; to foster the utilization of livestock and poultry breeding stock and crops of known genetic characteristics and demonstrated performance; to provide the agricultural community with market information useful in planning for efficient production, marketing and promotion of farm products; and to prevent the introduction or spread of pests detrimental to crop production.

Through its specialists across the country, Agriculture Canada's Production and Marketing Branch is in contact with producers, processors and distributors and ensures the proper application of some 26 pieces of agricultural legislation (Table 8.6). Its work is organized according to commodity groups or functions between which resources are allocated (Figure 8.4). The ten provincial departments of agriculture perform related and complementary activities to those of Agriculture Canada (Table 8.7). The following description of mainly federal undertakings is offered mainly as an illustration of governmental production and marketing programs; a complete inventory of the latter is beyond the scope of this report.

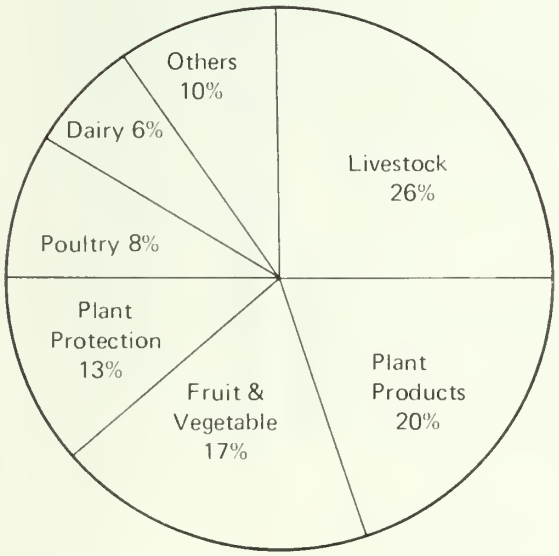
### 8.4.1 Dairy

The Dairy Division of Agriculture Canada administers legislation concerned with the production and marketing of wholesome,

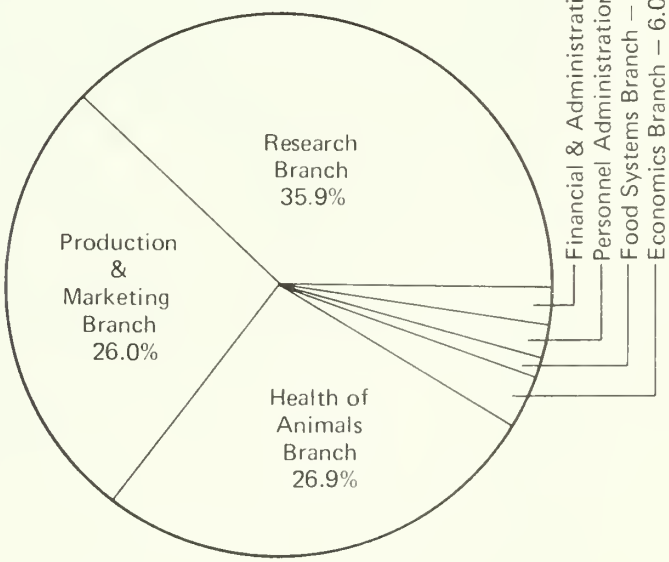
FIGURE 8.4
**RESOURCE ALLOCATION FOR PRODUCTION AND MARKETING, AGRICULTURE CANADA, 1975–76**




TOTAL P&M BUDGET
$34.8M




TOTAL MAN–YEARS: 2200




BRANCH DISTRIBUTION OF TOTAL
AGRICULTURE CANADA STAFF (9668)

Table 8.6 LEGISLATION ADMINISTERED BY AGRICULTURE CANADA'S PRODUCTION AND MARKETING BRANCH, 1975/76

Agricultural Products Board Act
Agricultural Products Cooperative Marketing Act
Agricultural Products Marketing Act
Agricultural Stabilization Act
Appropriations Act
Canada Agricultural Products Standards Act
Canada Dairy Products Act
Cold Storage Act
Consumer Packaging and Labelling Act
Exhibition Grants Regulations
Feeds Act
Fertilizers Act
Food and Drugs Act
Fruit, Vegetable and Honey Act
Grading Regulations - Beef, Pork, Lamb, Mutton and Wool
Livestock and Livestock Products Act
Livestock Pedigree Act
Maple Products Industry Act
Pest Control Products Act
Plant Quarantine Act
Potato Warehouse Assistance Regulations
Seeds Act and Regulations
Stockyards Regulations
Two-Price Wheat Act
Weights and Measures Act
Western Grain Stabilization Act

Table 8.7 NUMBER OF PROVINCIAL POLICIES AND PROGRAMS FOR AGRICULTURE, CANADA, 1976

| | Horticulture & Field Crops | Livestock | Engineering & Soils | Insects & Diseases | Agricultural Economics | Agrelature[a] |
|---|---|---|---|---|---|---|
| British Columbia | 5 | 20 | 6 | 12 | 22 | 8 |
| Alberta | 8 | 16 | 10 | 6 | 21 | 8 |
| Saskatchewan | 7 | 21 | 23 | 10 | 5 | 4 |
| Manitoba | 14 | 16 | 10 | 10 | 20 | 4 |
| Ontario | 7 | 38 | 5 | 12 | 18 | 14 |
| Quebec | 12 | 33 | 10 | 8 | 10 | 10 |
| New Brunswick | 11 | 30 | 11 | 3 | 9 | 5 |
| Nova Scotia | 8 | 15 | - | 8 | 13 | 3 |
| P.E.I. | 6 | 20 | 6 | 4 | 5 | 3 |
| Newfoundland | 6 | 16 | 8 | 5 | 6 | 6 |

[a]Generally, agricultural education, research and extension.

Source: Agriculture Canada, Pub. 76/12, 76/13 & 76/14.

high-quality dairy products. Each of the provincial departments of Agriculture have concurrent legislation to control dairy products within their boundaries. The responsibilities of the Dairy Division include plant inspection and registration, dairy product grading and inspection, and laboratory control programs. These programs assure maximum returns to producers and processors and a consistent volume of uniform, good-quality dairy products to consumers. Control of labeling provides the consumer with easily understood indications of quality of prepackaged dairy products; and market reports keep the industry abreast of current demand, supply and price information.

To carry out these activities, the Division employs a headquarters specialist staff at Ottawa and 121 other officers at 31 strategically located offices across Canada. This staff maintains close liaison with specialists in other federal departments, provincial departments of agriculture, and dairy industry associations and organizations.

### 8.4.2 Fruit and Vegetable

The federal Fruit and Vegetable Division administers legislation concerning fresh and processed fruits and vegetables, as well as honey and maple products. It advises and assists producers, processors and distributors in the production and merchandising of their products; compiles crop and market information for publication; licenses interprovincial and international dealers and brokers in fresh produce, and investigates complaints from shippers and receivers. It also administers or assists in the administration of provincial legislation in all provinces.

The Division's inspectors examine fresh and processed products that are produced in Canada or imported, at all levels of merchandising, for compliance with grade, packaging and marking regulations. They also inspect and certify the grades of products being exported. Estimated volume of products monitored in 1975-76 is in the order of 3,200 tonnes. Processing plants and fresh-produce warehouses are registered and supervised by the Division, and processors and packers are kept advised of the latest methods and equipment.

Officers of the Division assist the Agricultural Stabilization Board in carrying out its policies on fruits and vegetables. The Division maintains close contact with other federal departments and branches and all provincial departments of agriculture, and works closely with the United States Department of Agriculture.

### 8.4.3 Grains and Special Crops

Agriculture Canada established its Grains and Special Crops Division in 1970, to promote a sound, healthy and viable grain, oilseed and special crop industry. Two programs fall under the

Division's jurisdiction, namely two-price wheat and western grain stabilization.

The Division works in close cooperation with other departments and agencies of the federal government, and with provincial governments, producer organizations and others to maintain a coordinated approach to the field crop industry.

### 8.4.4 Livestock

Agriculture Canada's Livestock Division administer policies designed to assist in the improvement of livestock production and marketing in Canada, and in racetrack control.

Members of the Livestock Division grade beef, veal, hog, lamb and mutton carcasses in 164 inspected and approved plants across Canada; supervise the grading of wool; promote the sale of Canadian furs, both domestically and internationally; inspect and tag ranched fox pelts on request; and supervise parimutuel betting at racetracks.

The Division supervises the administration of stockyards, including the bonding of commission merchants, dealers and cooperative sales agencies, auditing shippers' trust accounts and recording and issuing reports on the receipts, prices and disposition of livestock and meat marketing.

In the production field, the Division cooperates with provincial departments of agriculture and other agencies in livestock improvement programs. It supervises the issuance of registration and transfer certificates for purebred livestock; provides testing and recordkeeping services for record-of-performance programs for dairy cattle, beef cattle and swine; administers sire loan and other improvement policies; supports the work of the 4-H Club Council; makes grants to fairs and exhibitions; and administers a loan program for multipurpose fair and exhibition buildings to be used year-round for community activities.

A Showcase Herd of beef and dairy cattle is maintained to show prospective buyers samples of the good cattle to be found on Canadian farms.

### 8.4.5 Plant Products

Provincial departments of agriculture all have crops divisions with responsibilities in seeds programs; however, there is currently no provincial legislation in place that deals with manufacturing of livestock feeds, and the Plant Products Division, Agriculture Canada is the sole agency responsible for the application of the Feeds Act in Canada. Also, most provinces rely almost exclusively on federal regulatory authority to establish the conditions of sale and use of pest control products and fertilizers.

Thus, Agriculture Canada's Plant Products Division plays a major role in assuring that input products to agricultural production are effective and safe under practical conditions of use; and in assisting in the orderly marketing of seed, hay, straw and flax, and in the production and marketing of pedigreed seed. The Division provides the Department with information, assessments and recommendations on national production and marketing policies in relation to these input products.

In carrying out its programs, the Division provides for the registration of feeds, fertilizers and pesticides and the licensing of seed varieties. Field staff inspect these commodities in the trade from the manufacturer to the user. Sampling and analysis provide the basis for enforcement action when products do not comply with established standards related to usefulness, safety and accurate representation. The production and use of pedigreed seed is promoted in cooperation with the provinces. Statistics are gathered and published on seed production and markets. Information is also provided on the other regulated commodities.

### 8.4.6 Plant Protection

The Plant Protection Division of Agriculture Canada is responsible for protecting Canadian agricultural and forest crops from foreign plant pests; for maintaining the high quality of seed potatoes, flower bulbs and seed peas produced in Canada; and for assuring that plants materials being exported meet the requirements of importing countries.

Inspectors examine imported plants and plant products at ocean ports and on importers' premises, and treat, destroy or return to the country of origin any found to be infested. Permits issued by the Division are required for the import of all plant materials into Canada. Certain plants and plant products, insects and disease organisms are permitted entry for research and educational purposes only.

As another phase of their work, inspectors of the Division examine and certify plant material for export; inspect flour mills, terminal elevators, warehouses and ships that are loading export cargoes of Canadian grain and grain products; and, when required, supervise fumigation vaults at Montreal and Saint John (N.B.). They also enforce domestic quarantines to restrict the spread of insect and other pests from one area to another in Canada.

In cooperation with the Canadian Forestry Services, Environment Canada, and with provincial governments, the Division conducts projects and surveys in forest areas to determine the extent of infestations of pests or diseases, and recommends control measures. It also regularly inspects nurseries that import and export plants.

### 8.4.7 Poultry

Federal authority on poultry products extends to interprovincial trading and to international commerce. This has been achieved for all poultry grading by arranging to have each of the provinces adopt complementary regulations.

Programs and regulations of Agriculture Canada's Poultry Division deal with the improvement of commercial and poultry breeder flocks, hatchery operations, and the enforcement of grade and quality standards for poultry products. The field staff provides technical assistance and guidance in developing production and quality control programs; interpreting, publicizing and enforcing grading regulations; and promoting improved merchandizing methods, to allow producers to receive maximum benefit from market opportunities.

In addition, through the Branch's Marketing Services, the Division gathers, interprets and publishes production and marketing statistics useful to producers and others financially interested in planning production and controlling the flow of poultry products to available markets.

### 8.4.8 Marketing Services

Agriculture Canada's Marketing Services is responsible for the promotion and upgrading of the agricultural marketing services of the country for the ultimate benefit of producers. It administers two pieces of legislation, the Agricultural Products Marketing Act and the Agricultural Products Cooperative Marketing Act.

The Agricultural Products Marketing Act is available for extending federal marketing powers to provincial marketing boards to control provincial produce destined for interprovincial and international trade. It also allows such boards to use levies in market development programs. The Agricultural Products Cooperative Marketing Act makes initial payments possible for producers who wish to market their products cooperatively. Marketing Services maintains close liaison with provincial and national marketing agencies to encourage use of this legislation. It also works with farm product marketing agencies and other agribusiness groups on market organization and distribution systems, to promote and improve the efficiency of agricultural product transfer in the food distribution chain.

The Markets Information Section, part of the Marketing Services, is responsible for assembling and compiling data collected by field officers of the commodity divisions on commercial marketings of livestock, fruits and vegetables, and dairy and poultry products. It relays a wide range of up-to-the-minute statistical market reports based on this data to

producers, processors, distributors and government personnel to assist them in making marketing decisions.

### 8.4.9 Food Advisory Services

All provincial departments of agriculture have such services. The role of Agriculture Canada's Food Advisory Division exemplifies well that of its provincial counterparts, namely: first, to convey to the Department the consumer viewpoint concerning agricultural products; second, to provide consumers with information that will stimulate agricultural food sales and enable wise spending decisions; and third, to provide consumers with information concerning departmental programs that affect them.

## 8.5 OTHER FUNCTIONAL SERVICES

### 8.5.1 Health of Animals

Agriculture Canada maintains an animal health service to help safeguard human health and to ensure the supply of wholesome meat and meat products to the public. The programs it undertakes promote animal disease research and control, ensure the humane slaughter of food animals, and enforce meat inspection regulations.

The Health of Animals Branch controls and regulates the importation of animals and animal products, eradicates established diseases, and is responsible for the certification of livestock for export. The Branch also provides statistical data to other branches of the Department to keep them accurately informed on the state of health of the country's livestock industry.

The Canada Meat Inspection Act required that all meat slaughtering and processing plants dealing in interprovincial and export trade operate under the federal meat inspection system. Inspection is mainly directed at the detection of diseases such as tuberculosis, brucellosis, parasitic infestation and the like. In registered slaughtering plants, all animals receive an antemortem inspection to detect diseases that would make them unfit for food. A postmortem inspection is also carried out to determine the health status of each animal carcass. Inspection extends to all phases of processing of meat food products. All ingredients going into meat food products are examined for quality and quantity to ensure that no adulteration takes place.

The Health of Animals Branch has jurisdiction over 450 establishments in all, 128 of which are red-meat slaughtering and processing plants, 63 are slaughtering and processing poultry plants, five are rabbit-slaughtering plants, four are for slaughtering buffalo and game, four are horse-slaughtering plants, and the remaining plants do no slaughtering but process either poultry or red-meat products. In addition, 261 outside approved storages are supervised for the convenience of

registered establishments. Also operating under the Branch's supervision are 19 inedible rendering plants, where condemned and inedible material originating in registered establishments is treated. Some 1300 meat inspectors are engaged in this work, about a quarter of whom are professional veterinarians.

### 8.5.2 Economic Analysis

The Economics Branch of Agriculture Canada contributes the social science component, primarily economics, required to provide comprehensive policies and programs for developing Canada's agriculture and food sector.

To serve its objectives, the Branch defines economic problems; identifies economic opportunities; recommends policies and programs; and contributes to a better understanding of opportunities and problems through research. It provides economic analysis and consulting services for the Minister, the Department and allied federal agencies; projects trends and prospects in agriculture; disseminates economic information; and develops and operates certain national economic programs for agriculture. Although the main clients for the output are the Minister and senior officials of the Department, other federal departments, provincial governments, international organizations and farm groups also make use of the work of the Branch.

## 9. INSTITUTIONAL COORDINATION AND LIAISON - HIGHLIGHTS

1975

1. Agriculture Canada and a number of other federal bodies as well as the provincial departments administer programs directly in the field of agriculture. All eleven governments generally cooperate and consult with a real degree of success in attempting to work out mutually acceptable policies and solutions. Since 1951, federal expenditures in agriculture have generally been about twice procincial expenditures. In 1973-74, federal and provincial expenditures in agriculture together totalled $1.0 billion.

2. The major federal-provincial coordinating mechanism in agricultural matters is embodied in the Canadian Agricultural Services Coordinating Committee (CASCC) established in 1932. At its annual meetings, CASCC considers the recommendations of its regional counterparts, of its special committees and of the Canada Agricultural Research Council; where appropriate, it recommends action by one or more of the agencies represented by its 36 members.

3. Other federal-provincial coordination mechanisms include the various ministerial conferences held annually, Agriculture Canada's Food Systems Branch and the annual Outlook Conference.

4. Canada's many agricultural industry associations also play a major role in shaping the country's agriculture and food system. In 1975, there were 1750 cooperatives, 109 marketing boards or agencies, three major unions/ federations and numerous trade associations involved in anticipating problems and opportunities and/or planning and recommending programs in agriculture.

# 9. INSTITUTIONAL COORDINATION AND LIAISON

## 9.1 FEDERAL AND PROVINCIAL COORDINATION

Section 95 of the British North American Act officially provides the constitutional authority of jurisdictions in agriculture and sets up a joint assignment of authority with priority to federal legislation. Despite the apparent clarity of this text, many legal issues have arisen, especially in regard to the scope and nature of activities that constitute "agriculture", and what constitutes legislation that is "repugnant" to a federal Act. The situation has been further complicated by the fact that, apart from Agriculture Canada, a number of other federal bodies administer programs directly in the field of agriculture, or in a field affecting agriculture (Table 9.1). This overlapping situation is somewhat duplicated at the provincial level. Nonetheless, it is important to note that all eleven governments generally cooperate and consult with a real degree of success in attempting to work out mutually acceptable policies and solutions.

Both federal and provincial governments have, over the years, been deeply involved in working for the overall well-being of agriculture; federal expenditures since 1951 have generally been about twice provincial expenditures (Table 9.2).

Provincial departments of Agriculture provide a number of their own programs in areas of federal input, e.g., farm credit and farm management; however, these have generally narrower and more limited objectives than programs sponsored by Agriculture Canada. Of the many services offered by the latter, particular attention is paid to quality control of farm inputs and produce, and to animal and plant health protection.

As agricultural affairs have evolved in practice, a complex mix of joint federal-provincial responsibilities has developed as illustrated in Table 9.3. Not included in the table are mechanisms really relating more to cooperation than coordination, if such a distinction may be made when no transfer of funds is involved. Such mechanisms are:

(1) Agriculture Canada supplies prize money and other grants to fairs and exhibitions recognized by the provincial governments. In the case of New Brunswick and Newfoundland, the federal grants are actually distributed by the provinces.

(2) In the field of quality control, federal inspectors administer provincial regulations on dairy, egg and poultry products to ensure uniform standards throughout the country and to avoid duplication of services. Also, hatchery sanitation is maintained through cooperative programs with provincial departments of agriculture, particularly through enforcing hatchery supply-flock policies.

Table 9.1 FEDERAL AGENCIES INFLUENCING AGRICULTURE, CANADA, 1976[a]

Administering programs in agriculture:

| | |
|---|---|
| 1. Agricultural Products Board | Buys, sells or imports agricultural products and administers food contracts and other commodity operations; it may purchase and hold stocks for later sale, emergency relief in Canada or assistance programs abroad. |
| 2. Agricultural Stabilization Board | Stablizes commodity prices through offers to purchase, deficiency payments or payments for the benefit of producers. For certain commodities, may set a minimum and maximum volume for which each producer is entitled to support price. |
| 3. Canadian Dairy Commission | Administers the federal support program for industrial milk, cream and manufactured dairy products. The four key areas to the program are: purchase of dairy products for export or resale, producer levies, market-sharing quotas and direct subsidy payments to producers. |
| 4. Canadian Grain Commission | Maintains contact with producers and licensees at country points; investigates producers' complaints; inspects licensed primary elevators to ensure adherence to provisions of the Canada Grain Act Regulations. |
| 5. Canadian Livestock Feed Board | Helps meet the cost of transporting feed grain for livestock and poultry from the prairies to Eastern Canada and British Columbia and the cost of transporting wheat from Ontario to Quebec, and wheat and corn from Ontario to the Atlantic provinces. |
| 6. Canadian Wheat Board | Under the Prairie Grain Advance Payments Act, western producers can get interest free cash advance for wheat, oat and barley stored on farms. The advances are subject to quota 'acres' restrictions and are repaid by deductions from payment for subsequent deliveries of grain. |
| 7. Central Housing and Mortgage Corporation | Mortgage loans are made available for housing construction on farms. |
| 8. Department of Finance | Guarantees loans granted to farmers by chartered banks and other designated lenders. Loans may be used to buy additional farm land, to buy agricultural implements and equipment, or carry out a wide range of farm improvement projects. |

| | |
|---|---|
| 9. Department of Industry Trade & Commerce | Promotes the growth and efficiency of the manufacturing and processing industries within Canadian agriculture and fosters the expansion of Canadian trade, including that of agriculture products. |
| 10. Department of Indian and Northern Affairs | Shares responsibility with the governments of Yukon and N.W.T. for developing land with agricultural capability North of the 60th parallel. No new concession will be made before the joint INA - Agriculture canada report on that territory's agricultural potential is completed. |
| 11. Department of Manpower and Immigration | Administers a number of farm-worker programs under Federal-Provincial Manpower Agreements. |
| 12. Department of Regional Economic Expansion | Under the General Development Agreements, DREE now administers the Agricultural and Rural Development Act and the Fund for Rural Economic Development, which are designed to help rural communities adjust to major socio-economic and technological changes. They represent joint federal-provincial ventures. A provincial government official in every province coordinates programs under ARDA. In the case of FRED, agreements have been signed with New Brunswick, Quebec, Manitoba and P.E.I. The Prairie Farm Rehabilitation Administration is another federal-provincial development undertaking; it is primarily concerned with combatting drought in the prairies. |
| 13. Department of Veterans Affairs | Veterans who are full-time farmers on economic farm units may receive loans of up to $40,000. They pay an interest rate of 3 1/2 percent of the first $6,000 and whatever rate is in force at the time the loan is approved, on the balance. |
| 14. Farm Credit Corporation | Much unofficial coordination is carried out by the Chairman who attempts to meet annually with each provincial Deputy Minister of Agriculture. Area managers work toward formulating farm credit policies which complement those of the provincial departments of agriculture. FCC also actively participates in the Annual Agricultural Credit Conference sponsored by the Canadian Bankers'Association and attended by representatives of the provincial and federal governments, agribusiness and farmers' group. |

| | |
|---|---|
| 15. Industrial Development Bank | Ensures the availability of credit to industrial enterprises by supplementing the activities of other lenders, with particular emphasis in meeting the needs of small firms. |
| 16. National Farm Products Marketing Council | Promotes an efficient and competitive agricultural industry; aims to obtain fair returns for producers; improves and develops markets and products to assure consumers of an adequate supply of farm products. Under the Agricultural Products Marketing Act, may grant a provincial board that regulates the marketing of products within a province, authority to extend its powers to include interprovincial and export trade. |
| 17. National Research Council | Initiates and conducts research in the natural sciences and technology, including agriculture. Among current projects are research programs on meat and vegetable preservation and on waste disposal. Numerous other projects are carried out at the Prairie Regional Laboratory in Saskatoon. |
| 18. Public Service Commission | Provides for the appointment of qualified personnel and operates staff training and development programs for Agriculture Canada. |
| 19. Statistics Canada | The Agriculture Division compiles, analyses, abstracts and publishes statistical information on Canada's agriculture and conducts a census of agriculture at five-year intervals. |
| 20. Transport Canada | Is responsible for the deep waterway of the St. Lawrence Seaway through the St. Lawrence Seaway Authority; has jurisdiction over government grain elevators and thirteen Canadian harbours through the National Harbours Board; administers the Crowsnest Pass rates, and as such, influences much of the Canadian traffic in agricultural products. |
| 21. Unemployment Insurance Commission | Ensures that the legitimate demands of claimants who are full-time or part-time farmers are satisfied. |

Administering programs affecting agriculture[b]

| | |
|---|---|
| 1. Department of Consumers and Corporate Affairs | Concerned with the true labelling, marking, packaging and advertising of food products; administers the Industrial Design Act; carries out the provisions of the Bankruptcy Act and the Canada Corporations Act. |

| | |
|---|---|
| 2. Environment Canada | Provides weather reporting and forecasting services, assistance and expertise to agencies engaged in land use planning; coordinates the management of solid agricultural wastes with emphasis on recycling; generally develops and enforces environmental protection regulations. |
| 3. Health and Welfare Canada | The Food Directorate protects the public against health hazards related to food by ensuring safeguards in the manufacture, importation, sale and advertising of foods. The Environmental Health Directorate assesses hazards of technological changes and, through research and a number of services, protects the population from unknown or suspect chemical health hazards of the air and water. |

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[a]Excluding Agriculture Canada, with the exception of agencies 1 to 4 which fall under its jurisdiction.

[b]There are a number of federal agencies influencing agriculture more or less remotely; only those with a major impact have been listed here.

Source: Information Canada, Organization of the Government of Canada, 1975.

Table 9.2 FEDERAL AND PROVINCIAL GOVERNMENT EXPENDITURES IN AGRICULTURE, CANADA, 1960/61 to 1973/74

| Year | FEDERAL $000,000 | % | PROVINCIAL $000,000 | % | TOTAL $000,000 |
|---|---|---|---|---|---|
| 1960-61 | 269 | 78 | 77 | 22 | 364 |
| 1961-62 | 295 | 79 | 77 | 21 | 371 |
| 1962-63 | 240 | 77 | 72 | 23 | 212 |
| 1963-64 | 295 | 78 | 81 | 22 | 376 |
| 1964-65 | 237 | 71 | 100 | 29 | 337 |
| 1965-66 | 266 | 68 | 127 | 32 | 393 |
| 1966-67 | 306 | 63 | 178 | 37 | 484 |
| 1967-68 | 378 | 70 | 159 | 30 | 537 |
| 1968-69 | 424 | 68 | 196 | 32 | 620 |
| 1969-70 | 632 | 74 | 219 | 26 | 851 |
| 1970-71 | 447 | 68 | 212 | 32 | 659 |
| 1971-72 | 541 | 70 | 229 | 30 | 770 |
| 1972-73 | 636 | 69 | 273 | 31 | 909 |
| 1973-74 | 710 | 68 | 321 | 32 | 1,031 |

Source: Statistics Canada, Cat. 68-207 and 68-211.

Table 9.3 FEDERAL-PROVINCIAL AGRICULTURAL PROGRAMS ADMINISTERED BY AGRICULTURE CANADA, 1975

| Program [a] | Administered by | Authority | Payment [b] | Purpose | Financing & Operation |
|---|---|---|---|---|---|
| 1. Agricultural Exhibition Loans | Production & Marketing Branch - Livestock Division | Appropriation - Acts | $ 24,117,000 (since 1971) | To finance the construction and improvement of multi-purpose exhibition facilities | Federal loans to exhibition corporations recognized by the provinces are unconditionally guaranteed by provincial (or municipal) government co-signer. |
| 2. Canada Farm Building Plan Service | Research Branch - Engineering Research Service | Departmental mandate | $ 14,554 | To produce building plans for a wide variety of farm uses | The Canada Committee on Agricultural Engineering meets annually to determine year's program; each body administers its own funds but the provinces pay Agriculture Canada $2 per original drawing they receive. |
| 3. Canadian Forage Seed Project | Production & Marketing Branch - Plant Products Division | Departmental mandate | $ 170,000 [c] | To multiply and distribute upper generations of public forage seed varieties | At their annual meeting, breeders, growers, tradesmen, representatives of the provincial departments of Agriculture and of Plant Products Division evaluate seed supplies (mainly foundation and certified) in view of the estimated requirements, and buy and sell stocks accordingly. |
| 4. Canfarm | Economics Branch | Departmental mandate | $ 6,000,000 (no inter-governmental transfer) | To encourage profitable farming by operating a computerized farm accounting and management information system | The Federal provides services and facilities for common needs; provinces (universities, banks and agri-business) ensure delivery of services to individual farmers. |
| 5. Capital Assistance to Veterinary Colleges | Health of Animals Branch | Order in Council -agreements with Quebec, Ontario and Saskatchewan | $ 2,200,660 | To expand veterinary teaching facilities in order to increase the number of graduates | Federal contribution of up to 50 percent of the capital cost of enlarging the veterinary colleges in each provinces. |
| 6. Crop Insurance | Production & Marketing Branch | Crop Insurance Act and Regulations - agreements with all provinces | $ 31,272,000 | To provide stability of farmer income when crop losses occur | Provinces operate the programs. The Federal assists them in guaranteeing a level of production to cover out-of-pocket expenses by contributing a portion of premium costs and/or administrative costs; individual farmers pay 50 percent of total premiums. |

| Program [a] | Administered by | Authority | Payment [b] | Purpose | Financing & Operation |
|---|---|---|---|---|---|
| 7. 4-H Clubs Assistance | Production & Marketing Branch - Livestock Division | Appropriation Act - agreements with all provinces | $ 166,474 | To provide leadership and citizenship training for young people living on farms | The Federal reimburse to the provinces 50 percent of their expenditures on specified items of assistance to 4-H Clubs. |
| 8. Freight Assistance to the Royal Winter Fair | Production & Marketing Branch - Livestock Division | Appropriation Acts - agreements with all provinces except Ontario | $ 45,289 | To provide reimbursement to the provinces of 75 percent of the freight charges on exhibition livestock shipped to and from Toronto | Freight costs shared by the Federal only on carload lots from a central collecting point in each province and return; federal assistance is not available to Ontario where the fair is held. |
| 9. Intraprovincial Meat Inspection | Health of Animals Branch | Order in Council-agreements with Manitoba, Saskatchewan and Nova Scotia | $ 75,200 (payments by province to the Federal) | To allow provinces to obtain federal meat inspection in provincial plants not otherwise inspected federally; to avoid duplication and encourage uniformity of standards | No charge for the services of federal inspectors in plants which process meat for interprovincial trade or for export; the Federal invoices participating provinces at a uniform rate of $2.37 per animal unit for inspection in plants producing for provincial markets only and conforming to federal terms. |
| 10. Movement of Breeding Ewes | Production & Marketing Branch - Livestock Division | Appropriation Acts and departmental mandate | $ 7,200 | To assist in moving ewes from areas of surplus to areas of deficient sheep production; to foster utilization of breeding stocks of demonstrated performance | Provinces make actual payment for freight expenses to individuals who ship ewes and then invoice the Federal for half the cost; maximum federal contribution is of $3.00 per head. |
| 11. Rabies Indemnification | Health of Animals Branch - Contagious Diseases Division | Departmental mandate and Rabies Indemnification Regulations - agreements with New Brunswick, Quebec, Ontario, Saskatchewan and Alberta | $ 84,988 | To assist in the control of rabies in farm animals by encouraging farmers to report cases where animals have died as a result of rabies | Provinces may order living animals to be slaughtered and provide compensation to owners in respect of these animals; the Federal reimburses the provinces for two fifths of the amounts paid by them up to a specified maximum. |
| 12. Record of Performance | Production & Marketing Branch - Livestock Division | Departmental mandate | $ 4,000,000 | To help pure-bred and commercial breeders identify the sires and females in their herds which yield the most profitable progeny | Programs exist for dairy, beef, swine, and recently, sheep; provincial responsiblities vary with individual programs from full-responsibility for test stations to shared responsibility for home testing. |

| | Program[a] | Administered by | Authority | Payment[b] | Purpose | Financing & Operation |
|---|---|---|---|---|---|---|
| 13. | Research Station Buildings | Research Branch - Administration Division | Cost-sharing agreement or rental agreement on a favored-tenant basis | As per agreement | To encourage the sharing of accommodation and promote cooperation between federal personnel responsible for agricultural research and provincial personnel responsible for extension work | Subject to the terms of the particular agreements. In general, the province pays the federal for the space and services provided; initially, the province may share the cost of construction and thereafter, the annual operating costs. |
| 14. | Small Farm Development | Economics Branch and Farm Credit Corporation (Land Transfer Plan) | Appropriation Acts - agreements with all provinces except Newfoundland | $150,000,000 (total program allocation) | To help farmers who wish to take advantage of alternative rewarding opportunities or to retire from farming and also to assist other farmers who wish to purchase small farms and develop economies of scale | Grants of $1,500 plus 10 percent of the sale price of the farm up to a maximum of $3,500 are available to small farm vendors. Small scale farmers are extended credit on purchases of up to $20,000 with downpayments as low as $200; on purchases of more than $20,000 the downpayment is $200 plus 50 percent of the amount of the purchase over $20,000. |
| 15. | Soil Surveys | Research Branch - Soil Research Institute | Departmental mandate | $ 872,600 | To form a basis for soil management and land use programs | The Canada Committee on Soil Survey meets annually to set priorities and allocate projects between the Federal, the provinces and the universities; each body administers its own funds. |

a All programs operate on a continuing basis except item 5 which concludes with the completion of construction, item 13 which depends on the particular agreement and item 14 where agreements are signed for periods of five years.

b Federal expenditures / payments / loans for the year 1974-75 unless otherwise stated.

c Revolving fund; the project is expected to break-even.

Source: Federal-Provincial Relations Office, Federal-Provincial Programs and Activities, 1975.

## 9.1.1 Canadian Agricultural Services Coordinating Committee

The major federal-provincial coordination mechanism in agricultural matters is embodied in the Canadian Agricultural Services Coordinating committee (CASCC).

### Objectives

The National Advisory Committee on Agricultural Services, the progenitor of CASCC, was established in 1932 primarily to coordinate the total national effort toward the economic and social development of the agricultural industry and to promote the optimum utilization of manpower and financial resources within and between the various operational agencies.

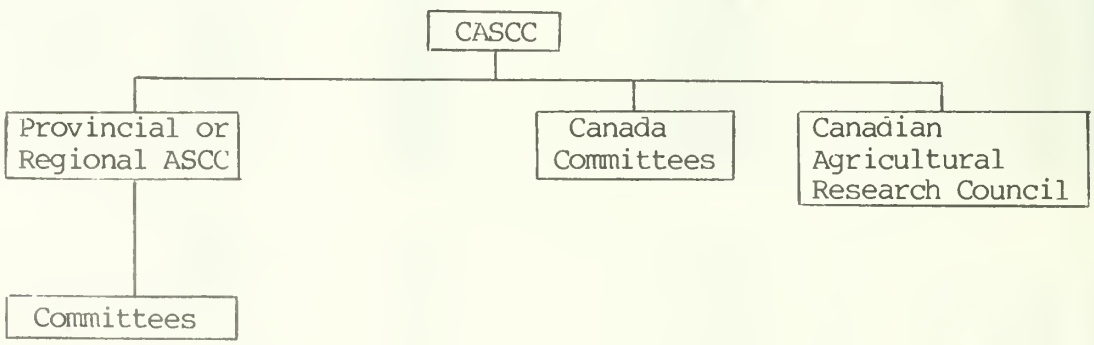
Since its formation CASCC has re-examined its role and organization at intervals, e.g., in 1951, 1964 and 1972. A major innovation in 1964 resulted in the sponsoring of provincial and/or regional Agricultural Services Coordination Committees.

### Organization

CASCC is an organisation of its members and is responsible only to itself. Each member, responsible to his own superior, is enabled to make decisions and recommendations in the light of the collective judgement of CASCC.
The current membership includes:

| | |
|---|---|
| Provincial Deputy Ministers | 10 |
| Deans, Colleges of Agriculture (including N.S.A.C.) | 8 |
| Deans, Colleges of Veterinary Medicine | 3 |
| Executive Director, Education and Research Division, Ontario | 1 |
| Chairman, Council of Research and Agricultural Services (Quebec) | 1 |
| Agricultural Institute of Canada | 1 |
| National Research Council | 1 |
| Statistics Canada, Agriculture Division | 1 |
| Agriculture Canada - (Deputy Minister, 6 Assistant Deputy MInisters, 2 Directors-General) | |
| Agricultural Economics Research Council | 1 (36) |

The current organization is as follows:



## Provincial or Regional ASCCs

Each of the six major provinces and the Atlantic Provinces as a group has an ASCC to coordinate activities within its region, to bring forward points of view and problems to CASCC, and to plan regional activities in the light of the overall national program. These ASCCs are supported by committees of experts from the various operating agencies and industry.

For example, the British Columbia ASCC consists of the British Columbia Deputy Minister of Agriculture, the Dean and another member of the faculty of Agricultural Sciences of the University of British Columbia, and the Directors of the Agriculture Canada Research Stations at Agassiz and Vancouver. It is supported by Lead Committees on animal science, engineering science, food science, plant science, soils science, and social science. Each Lead Committee has representatives from its sister committees and establishes *ad hoc* sub-committees as required to deal with specific problems.

## Canada Committees

CASCC, at its pleasure, sets up Canada Committees in particular areas to recognize and assess problems and recommend activities which should contribute to their solution. Generally, membership includes and expert from each of the seven regions plus experts from the federal government and from industry. The 1976 Committees are as follows:

Canada Committee on Forage Crops Breeding
Canada Committee on Soil Survey
Canada Committee on Soil Fertility
Canada Committee on Agrometeorology
Canada Committee on Pesticide Use in Agriculture
Canada Weed Committee
Canada Committee on Plant Gene Resources
Canada Committee on Grain Breeding
Canada Committee on Grain Diseases
Canada Committee on Animal Nutrition
Canada Committee on Meat
Canada Animal Health Committee
Canada Committee on Agricultural Engineering
Canada Farm Management Committee
Canada Committee on Biting Flies
Cooperative Committee on Agricultural Communications (17)

Generally, CASCC does not assign an 'operational role' to a committee. Rather, the recommendations of the committee lead to specific action by an operating agency or agencies.

### Canadian Agricultural Research Council (CARC)

In 1974, CASCC authorized the establishment of the Council. It is responsible to CASCC for the coordination of the national agricultural research program including recommending priorities in the allocation of resources. In April 1976, the Council published an inventory of current agricultural research projects being carried out by federal and provincial governments as well as by universities, industries and other research establishments. CARC has also been charged with the responsibility of maintaining an information data base for use by CASCC and others concerned with management of agricultural research and development.

### The Function of CASCC

At its annual meetings, CASCC considers the recommendations of the provincial or regional ASCCs; the Canada Committees; the Canada Agricultural Research Council; and, where appropriate, recommends action by one or more of the agencies represented by its members. Assignments to the Canada Committees and to the Canada Agricultural Research Council also may arise out of its deliberations.

The Deputy Minister, Agriculture Canada, is Chairman of CASCC and uses the resources of the Department as required to fulfill secretariat functions. The Assistant Deputy Minister (Research) is delegated the immediate responsibility for the day-to-day servicing of the Canada Committees and the provincial/regional ASCCs. Provincial departments, universities and industry contribute experts to action committees as the need arises.

## 9.1.2 Food Systems Branch

The Food Systems Branch was established in 1972 to provide leadership on behalf of Agriculture Canada in developing national goals and objectives for the food system. It is a liaison link with producer and industry organizations within the food system; acts as a coordinating body for federal policies and programs related to the food system; and assists in planning, coordinating, reviewing and assessing interbranch programs within the Department.

## 9.1.3 Ministerial Conferences

The task of coordinating agricultural policies in Canada is also dealt with in the context of ministerial conferences and meetings. Conferences bringing together the Prime Minister and the Provincial Premiers, and since 1961, conferences of provincial Prime Ministers, are held at yearly intervals in order to discuss current issues and to harmonize programs, agricultural and others. Each province hosts the conference in turn, as is the case with the annual meeting of Provincial Ministers of Agriculture.

The latter is really the most significant ministerial conference with reference to agriculture; its purpose to two-fold:

(1) to enable the provinces to develop a cooperative stance on policies as they concern inter-provincial operations and activities; and
(2) to develop a common agreement in reaction to federal as well as federal-provincial policies and services. Examples of subjects which have been reviewed at these conferences in recent years are the national stabilization program and the Canadian dairy policy.

### 9.1.4 Outlook Conference

The Outlook Conference, organized by Agriculture Canada's Economics Branch, is another coordinating mechanism which each year brings together federal and provincial Deputy Ministers of Agriculture and their officials for a comprehensive look at the prospects for the Canadian agricultural industry.

The two-day conference, with attendance by some 500 persons from all sectors of the agriculture and food system, provides outlook information on individual farm commodities, farm income, production costs and trade prospects for agricultural products. Initiated in 1930, the Conference concerns itself with short-term outlook and is designed essentially to provide information assisting decision-makers at the production and marketing levels. It follows a series of pre-outlook regional conferences with more limited attendance, and is the culmination of a continuing process which generates weekly and quarterly publications on food outlook, regular market commentaries for different commodities, and various ad hoc press releases.

### 9.1.5 The Problems of Coordination

The Canadian agriculture and food system must exist within the reality of a geographically and climatically diverse environment and of varied political pressures which render coordination more difficult but all the more necessary.

For example, the problem of ensuring an adequate supply of reasonably-priced feed grains to the eastern provinces and British Columbia, while at the same time maintaining a satisfactory return on investment for prairie farmers, flows into the problem of beef and hog marketing.

In the dairy industry, provincial governments take responsibility for fluid milk pricing, quotas and pools, and the federal government operates price or income subsidies, import controls and export promotion. Each program affects the other and responsibility for dairy policy cannot be compartmentalized precisely between federal and provincial jurisdictions. The

required cooperation includes consultation on policy formulation, consistency among programs and removal of inequities between fluid and other milk shippers.

In the horticultural field, there are cases of competition and uncoordinated activities between provincial boards, as well as problems of board-marketed fruits and vegetables in some provinces competing with products marketed privately or by cooperatives in other provinces, the prime example of this being apples. To mention one last commodity area in which inter-regional coordination mechanisms were painfully introduced, the relatively recent "chicken and egg war" between Ontario and Quebec can be cited.

Apart from the problems relating to the definition of responsibilities between different levels of government, most of the issues which arise in the course of federal-provincial discussions and negotiations generally fall into the category of inter-regional problems. While the 1969 Task Force report warned against the dangers of balkanization of Canadian agriculture, it also recommended that increased attention be paid to regional problems and inter-regional disparities during the formulation of policy. It commended in principle the parts of ARDA & DREE programs that were adaptable to regional agricultural conditions.

The primary role of governments should be to produce a continuing desirable economic and social climate for farmers and agribusiness. It appears that such aims would be best attained through some form of long-term planning. However, in view of the nature of existing federal-provincial coordination and liaison mechanisms, and especially in view of the many inter-regional problems which arise, it would also appear that a considerable amount of agricultural planning in Canada is of a type which reacts to altering circumstances, with relatively little attention paid to long-term planning.

Nonetheless, from the point of view of efficiency, such planning and coordination is most desirable provided it is supported by a strong public information program to give a clear picture of available alternatives and to guide policy formulation.

## 9.2 INDUSTRY ASSOCIATIONS

In addition to the growing number of agriculture and food trade associations, there are over 10,000 identifiable local, provincial and national farmer organizations in Canada, including cooperatives, unions and marketing boards. Apart from the strictly industrial organizations, there are hundreds of local bodies such as horticultural societies and community improvement associations which draw upon farmers for membership. Table 9.4 illustrates the relative frequency of the various types of agricultural industry associations in each province.

Table 9.4 DISTRIBUTION OF REPORTING NATIONAL & REGIONAL INDUSTRY ASSOCIATIONS IN AGRICULTURE, CANADA, 1976

| Province | Cooperatives | Marketing Agencies[a] | Trade Associations[b] | Unions & Federations[c] | Others[d] | Total Numbers |
|---|---|---|---|---|---|---|
| | | | - percent - | | | |
| Newfoundland | | 40 | | 20 | 40 | 5 |
| P.E.I. | | 31 | 52 | 7 | 10 | 29 |
| Nova Scotia | | 33 | 55 | 4 | 8 | 24 |
| New Brunswick | 6 | 46 | 39 | 3 | 6 | 31 |
| Quebec | 6 | 29 | 17 | 37 | 11 | 35 |
| Ontario | 2 | 26 | 48 | 6 | 19 | 101 |
| Manitoba | 9 | 40 | 34 | 3 | 14 | 35 |
| Saskatchewan | 8 | 12 | 65 | 6 | 9 | 64 |
| Alberta | 2 | 28 | 52 | 6 | 12 | 60 |
| British Columbia | 15 | 20 | 47 | 3 | 15 | 65 |
| Canada | 6 | 27 | 46 | 8 | 13 | 449 |

[a]Includes boards, commissions & pools.
[b]Includes councils.
[c]Includes syndicates.
[d]Includes clubs, institutes & societies.

Source: Agriculture Canada, Directory of Farmers' Organizations & Marketing Boards in Canada, Pub. 1365, 1976.

### 9.2.1 Cooperatives

Cooperative organizations aim at providing their members with the savings, increased bargaining power and other advantages of larger enterprises. Membership is voluntary and need not be periodically renewed as is generally the case with union membership.

The agricultural cooperative movement in Canada dates back to the 1910's and is one of the best organized in the world. It is difficult to segregate out specific data on purely agricultural cooperatives beyond estimating their volume of business, numbers and membership; in 1975, these stood respectively at $4.8 billion, 1,750 and 1,239,000. However, the majority of Canadian cooperatives being involved in agriculture, the information relating to all cooperatives in the country becomes relevant.

In part reflecting the general productivity trends in this country's agriculture since 1950, overall volume of cooperative business mushroomed from $1.0 billion in 1950 to $4.9 billion in 1974, while the number of cooperatives decreased by 33 percent during the same period (Table 9.5). Asset values of all cooperatives appreciated from $0.3 billion to $2.3 billion, with grain inventories, gas and rural electric associations in Alberta, and dairy enterprises in Quebec providing most of the growth impetus (Table 9.6).

Canadian agricultural cooperatives are concerned with production, service, marketing and purchasing. Of special interest are the latter two types which enjoyed a record business volume of $4.8 million in 1974 and accounted for more than 90 percent of the volume of business of all cooperatives in the country. Studies suggest that these cooperatives have not been encountering serious problems in financing their increased business, although there has been a trend towards greater reliance on outside sources of finance to provide the necessary capital.

Over the last 25 years, grains and seeds have remained the major products marketed by Canadian marketing and purchasing cooperatives, while feed, fertilizers and spray materials have continued to be the principal merchandise supplied. In 1974, the latter accounted for 31 percent of the goods handled by all such cooperatives, while grain and seeds amounted to 62 percent (Table 9.7).

### 9.2.2 Marketing Agencies

Marketing agencies, as defined in this section, includes boards, commissions, agencies or others, that perform marketing board functions, whatever their degree of producer control.

Table 9.5 ALL COOPERATIVES BY PROVINCE, CANADA, 1950 AND 1974

| Province | 1950 | 1974 | 1950 | 1974 |
|---|---|---|---|---|
| | - number - | | - membership (000) - | |
| British Columbia | 161 | 76 | 66 | 226 |
| Alberta | 287 | 683 | 231 | 457 |
| Saskatchewan | 621 | 459 | 427 | 423 |
| Manitoba | 163 | 85 | 166 | 192 |
| Ontario | 462 | 133 | 136 | 166 |
| Quebec | 932 | 585 | 121 | 241 |
| New Brunswick | 91 | 71 | 14 | 27 |
| Nova Scotia | 152 | 115 | 24 | 37 |
| Prince Edward Island | 31 | 21 | 9 | 10 |
| Newfoundland | 8 | 5 | 138 | 164 |
| Interprovincial | 8 | 5 | 138 | 164 |
| TOTAL | 2,951 | 2,274 | 1,338 | 1,963 |

Source: Agriculture Canada, Cooperation in Canada, 1950 and 1974.

Table 9.6 SUMMARY OF ALL COOPERATIVES REPORTING, CANADA, 1974

| Groups | B.C. | Alta. | Sask. | Man. | Ont. | Que. | N.B. | N.S. | P.E.I. | Nfld. | Inter-prov. | Canada |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | - number - | | | | | | |
| Associations Reporting | | | | | | | | | | | | |
| Marketing & Purchasing | 64 | 105 | 226 | 71 | 97 | 381 | 40 | 83 | 16 | 35 | 5 | 1,123 |
| Production | - | 50 | 192 | 3 | 4 | 41 | 20 | 6 | 2 | - | - | 318 |
| Fishermen's | 2 | 2 | 19 | 3 | 2 | 9 | 8 | 18 | 3 | 3 | - | 69 |
| Services | 10 | 526 | 22 | 8 | 30 | 154 | 3 | 8 | - | 3 | - | 764 |
| Total | 76 | 683 | 459 | 85 | 133 | 858 | 71 | 115 | 21 | 41 | 5 | 2,274 |
| | | | | | | - $ million - | | | | | | |
| Volume of Business | | | | | | | | | | | | |
| Marketing & Purchasing | 294.6 | 877.4 | 1,487.2 | 258.3 | 390.0 | 742.0 | 54.1 | 151.0 | 21.6 | 31.3 | 462.0 | 4,769.6 |
| Production | - | 17.7 | 11.0 | - | .7 | 15.4 | .9 | 1.0 | - | - | - | 46.5 |
| Fishermen's | 19.5 | .3 | 1.2 | 1.3 | 1.2 | 7.6 | 6.2 | 9.4 | 4.2 | 1.6 | - | 52.4 |
| Services | 12.3 | 23.6 | 2.2 | 1.4 | 6.9 | 15.0 | .1 | .1 | - | .4 | - | 62.0 |
| Total | 326.3 | 919.1 | 1,501.4 | 261.1 | 398.1 | 780.0 | 61.2 | 161.4 | 25.8 | 33.2 | 462.0 | 4,930.5 |
| | | | | | | - $ million - | | | | | | |
| Assets | | | | | | | | | | | | |
| Marketing & Purchasing | 87.3 | 388.0 | 753.1 | 171.8 | 102.6 | 256.5 | 16.8 | 45.1 | 6.2 | 9.0 | 277.4 | 2,032.0 |
| Production | - | 15.6 | 10.7 | - | .4 | 14.6 | .5 | .1 | - | - | - | 42.0 |
| Fishermen's | 17.3 | .3 | 1.5 | .3 | .1 | 3.5 | 3.7 | 2.9 | 2.4 | .8 | - | 32.8 |
| Services | 5.0 | 117.9 | 3.6 | 2.9 | 19.2 | 33.3 | .2 | .1 | - | .5 | - | 182.6 |
| Total | 109.6 | 521.8 | 699.0 | 175.0 | 140.4 | 308.0 | 21.1 | 48.2 | 8.6 | 10.2 | 277.4 | 2,289.4 |

Source: Agriculture Canada, Cooperation in Canada, 1974.

Table 9.7 VOLUME OF BUSINESS OF ALL MARKETING AND PURCHASING COOPERATIVES REPORTING, CANADA, 1950 and 1974

| | $000,000 | |
|---|---|---|
| Products Marketed | 1950 | 1974 |
| Dairy Products | 134.6 | 643.3 |
| Fruits & Vegetables | 46.3 | 80.4 |
| Grains & Seeds | 383.6 | 1,951.2 |
| Livestock | 141.7 | 329.6 |
| Poultry & Eggs | 28.4 | 102.9 |
| Miscellaneous | 69.1 | 35.3 |
| Sub-Total | 803.7 | 3,142.8 |
| Supplies | 1950 | 1974 |
| Food Products | 56.5 | 422.4 |
| Clothing & Home furnishings | 8.4 | 44.5 |
| Petroleum | 23.9 | 217.1 |
| Feed, Fertilizer & Spray | 74.9 | 474.7 |
| Machinery | 9.5 | 227.0 |
| Building Materials | 14.6 | 81.5 |
| Miscellaneous | 18.3 | 82.8 |
| Sub-Total | 206.1 | 1,550.0 |
| Other Income | -- | 76.8 |
| TOTAL | 1.009.7 | 4.769.6 |

Source: Agriculture Canada, Cooperation in Canada, 1950 and 1974.

The main objective of marketing boards is to increase the incomes of their members as much as possible and to stabilize incomes and inputs. Membership is mandatory and their financing comes from compulsory check-offs. Their functions are discussed in chapter 6.

Marketing boards are regulated by the federal and provincial governments. Their activities vary widely from province to province both in history of development and in current scope. A provincial board has jurisdiction over an agricultural product produced and sold in the province. At the end of 1975, authority to regulate marketing in interprovincial and export trade had been granted to 79 provincial marketing boards.

Between the years 1958 and 1974, the number of producers involved in marketing boards more than doubled from 204,334 to 449,732. As total farm cash receipts increased steadily, the number of boards reporting membership rose from 66 to 105 and their share of total receipts increased from 13 to 57 percent. It should be noted, however, that at present the number of producers under boards is declining in line with the over-all decline in farm population. Tables 9.8 and 9.9 present a comparative review of marketing boards since 1958.

The 1970 Federal Task Force report found that single-commodity provincial boards achieved a fair amount of success through a variety of programs; it also indicated that no one type of program was best in all circumstances, although the need for a national approach and for import control was recognized. Because of the complex and far-reaching ramifications of any given commodity marketing board on other sectors of the economy as well as on producers of other farm commodities, it is imperative that the government-appointed supervisory marketing boards be well-staffed to evaluate producer proposals.

### 9.2.3 Unions and Federations

Apart from cooperatives and marketing boards, most Canadian farmers are organized into one of two major national bodies: the National Farmers' Union (NFU) and the Canadian Federation of Agriculture (CFA). The exception is in Quebec where the Union des Producteurs Agricoles (UPA) represents all farmers and where membership is mandatory; the UPA is affiliated with the CFA.

The NFU was founded in 1946 as an interprovincial council of producer organizations with voluntary membership. The provincial unions in New Brunswick, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia are now members of the NFU. The CFA was created in 1936 and is a federation of federations in that its members are organizations and not individuals; current membership includes three commodity associations and nine provincial federations (Newfoundland not included).

Table 9.8 MARKETING BOARDS, CANADA, 1958 AND 1974[a]

| Province | 1958 | 1974 | 1958 | Added 1958-1974 |
|---|---|---|---|---|
| British Columbia | 3 | 10 | Fruits, potatoes and other vegetables | Grains, dairy, broilers, turkeys, and eggs |
| Alberta | 11 | 8 | Canning vegetables | Grains, hogs, cattle, sheep and wool, dairy, broilers, turkeys, eggs and fowl, potatoes and other vegetables |
| Saskatchewan | | 5 | Honey | Grains, hogs, sheep and wool, dairy, broilers, turkeys,and eggs, |
| Manitoba | 1 | 8 | Honey | Grains, hogs, dairy, broilers, turkeys, eggs, vegetables, honey |
| Ontario | 18 | 22 | Wheat, seed corn, soybeans, hogs,dairy, fruits, vegetables, tobacco, dried beans, sugar beets | Broilers, turkeys and eggs |
| Quebec | 34 | 26 | Dairy, vegetables, tobacco, pulpwood, maple products | Broilers, turkeys, eggs, blueberries, and tomatoes |
| New Brunswick | 4 | 10 | Hogs, dairy and potatoes | Dairy, broilers, turkeys, eggs, apples, bedding plants, pulpwood |
| Nova Scotia | 3 | 7 | Hogs, wool, milk | Dairy, broilers, turkeys, eggs, pullets, tobacco, and wool |
| Prince Edward Island | 1 | 7 | Potatoes | Hogs, dairy, broilers, eggs, other vegetables, and tobacco |
| Canadian Wheat Board | - | 1 | | Eggs |
| Educational & Promotional | | 4 | | |
| Total boards reporting receipts | 66 | 109 | | |

[a]Includes commissions, agencies and pools.

Source: Agriculture Canada, Marketing Boards Statistics, 1958 and 1974.

Table 9.9 PRODUCERS' RECEIPTS THROUGH MARKETING BOARDS AS A PERCENTAGE OF FARM CASH RECEIPTS, BY PROVINCE, CANADA, 1958 AND 1974[a]

| Province | 1974 | 1974 | 1974 | 1958 |
|---|---|---|---|---|
| | - $000 - | | - % - | |
| British Columbia | 372,509 | 219,395 | 59 | 10.6 |
| Alberta | 1,728,283 | 800,817 | 46 | 0.2 |
| Saskatchewan | 2,056,445 | 1,417,791 | 69 | 0.1 |
| Manitoba | 842,437 | 451,309 | 54 | 0.4 |
| Ontario | 2,413,589 | 1,371,315 | 57 | 37.0 |
| Quebec | 1,161,040 | 622,811 | 54 | 6.0 |
| New Brunswick | 103,571 | 41,359 | 40 | 4.0 |
| Nova Scotia | 104,311 | 65,030 | 62 | 2.4 |
| Prince Edward Island | 84,418 | 30,016 | 36 | 0.0 |
| Canada[b] | 8,866,603 | 5,019,843 | 57 | 13.0 |

[a]Marketing 'boards' include commissions, agencies and pools. Producer's receipts for some marketing boards are reported on a crop-year basis.

[b]Newfoundland not included.

Source: Agriculture Canada, Marketing Board Statistics, 1958 and 1974.

The general objective of farm unions and federations is to improve the economic lot of its members, and in some cases also to improve their social and educational standards. In this context, they are expected to anticipate problems and opportunities, plan and recommend programs, as well as implement programs themselves or persuade others to do so and then evaluate the results.

It is clear that with a large number of organizations pursuing the same general goals, leadership and organizational resources can be dissipated in too many directions. Thus, in principal, the answer to whether there are too many farmer organizations would seem to be yes. However, there is another side to the coin, as there is an essential difference between a multi-product farmer and a single-commodity producer; for the former, there could be a good case for having separate organizations to concern themselves specifically with each activity. Nevertheless, many farmer organizations were probably born to meet a specific need but have persisted long after the need has disappeared, or when the interests concerned could be better served by another existing organization.

### 9.2.4 Trade Associations

A trade association serves as an industry voice in identifying problems, negotiating solutions, and in overall coordination to promote the industry. Membership is voluntary and power is mostly restricted to lobbying within the industry.

Many associations operate on a national basis and their activities are numerous and varied. They include working with different departments and branches of government, carrying on field work to help keep the industry in touch with producers and farm organizations, and contacting retailers and consumer groups to provide a yardstick for appraising public reaction to merchandising methods and trends.

The literature concerning trade associations is growing but is still comparatively limited. Table 9.10 indicates the major areas of influence of the principal trade associations, among other non-governmental organizations involved in Canadian agriculture.

Table 9.10 INFLUENCE OF NATIONAL NON-GOVERNMENTAL ORGANIZATIONS ON AGRICULTURAL POLICY INSTRUMENTS, CANADA, 1975

Key: XX Major influence
X Some influence

| Non-Government Organizations in the Canadian Agricultural and Food System | | Research and Development | Extension | Agricultural Education | Land Use | Farm Credit | Farm Machinery | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Legislation | Testing |
| Canadian Federation of Agriculture | 1 | X | X | X | XX | X | X | X |
| National Farmers Union | 2 | | X | X | X | X | X | |
| Canadian Seed Growers Association | 3 | X | X | | | | | |
| Canadian Cattlemen's Association | 4 | X | X | | | X | | |
| Dairy Farmers of Canada | 5 | X | X | X | | X | | |
| Canadian National Livestock Records | 6 | | | | | | | |
| Joint Beef Breeds of Canada | 7 | X | | | | | | |
| Canadian Swine Breeders | 8 | X | | | | | | |
| Canadian Hatchery Association | 9 | | X | | | | | |
| Canadian Horticulture Council | 10 | X | X | X | X | X | | |
| Canadian Egg Producers Council | 11 | | | | | | | |
| Canadian Poultry and Egg Processors Council | 12 | | | | | | | |
| Canadian Poultry and Egg Council | 13 | | | | | | | |
| Canada Grains Council | 14 | X | X | | | | | |
| National Dairy Council of Canada | 15 | X | | | | | | |
| Rapeseed Association of Canada | 16 | X | X | | | | | |
| Canadian Pork Council | 17 | X | | | | | | |
| Canadian Broiler Council | 18 | | | | | | | |
| Agriculture Institute of Canada | 19 | XX | X | XX | XX | X | | |
| Canadian Council of 4-H Clubs | 20 | | X | X | | | | |
| Canadian Fruit Wholesalers Association | 21 | | | | | | | |
| Canadian Seed Trade Association | 22 | X | | | | | | |
| Canadian Fertilizers Association | 23 | | X | | | | | |
| Canadian Food Processors Association | 24 | X | X | | | | | |
| Canadian Federation of Farm Equipment Dealers | 25 | | | | | | | |
| Canadian Feed Manufacturers Association | 26 | X | | | | | | |
| Canadian Nursery Trade Association | 27 | X | | | | | | |
| Canadian Farm and Industrial Equipment Institute | 28 | | | | | | | |
| Canadian Agricultural Chemicals Association | 29 | X | X | | | | X | |
| Grocery Products Manufacturers of Canada | 30 | | | | | | | |
| Meat Packers Council of Canada | 31 | X | | | | | | |
| Retail Merchants Association of Canada | 32 | | | | | | | |
| Retail Council of Canada | 33 | | | | | | | |
| Canadian Restaurants Association | 34 | | | | | | | |
| Consumers Association of Canada | 35 | X | | | | | | |

| Non-Government Organizations in the Canadian Agriculture and Food System | | Production Programs | | | | | |
|---|---|---|---|---|---|---|---|
| | | Animal Breeding | Plant Improvement | Plant and Animal Protection | Plant and Animal Products Regulation | Disease and Pest Control | Farm Development |
| Canadian Federation of Agriculture | 1 | | | | X | | XX |
| National Farmers Union | 2 | | | | | | X |
| Canadian Seed Growers Association | 3 | | XX | X | XX | | |
| Canadian Cattlemen's Association | 4 | X | | X | X | X | X |
| Dairy Farmers of Canada | 5 | X | | | X | | X |
| Canadian National Livestock Records | 6 | X | | | X | | |
| Joint Beef Breeds of Canada | 7 | X | | X | | | |
| Canadian Swine Breeders | 8 | X | | | | | |
| Canadian Hatchery Association | 9 | X | | X | X | | |
| Canadian Horticulture Council | 10 | | X | X | X | X | |
| Canadian Egg Producers Council | 11 | | | | | | |
| Canadian Poultry and Egg Processors Council | 12 | | | | | | |
| Canadian Poultry and Egg Council | 13 | | | | | | |
| Canada Grains Council | 14 | | X | X | X | | |
| National Dairy Council of Canada | 15 | | | | X | | |
| Rapeseed Association of Canada | 16 | | X | | X | | |
| Canadian Pork Council | 17 | X | | | X | | |
| Canadian Broiler Council | 18 | | | | X | | |
| Agriculture Institute of Canada | 19 | X | X | X | X | X | X |
| Canadian Council of 4-H Clubs | 20 | | | | | | |
| Canadian Fruit Wholesalers Association | 21 | | | | X | | |
| Canadian Seed Trade Association | 22 | | X | | X | | |
| Canadian Fertilizers Association | 23 | | | | | | |
| Canadian Food Processors Association | 24 | | | | X | | |
| Canadian Federation of Farm Equipment Dealers | 25 | | | | | | |
| Canadian Feed Manufacturers Association | 26 | | | | X | | |
| Canadian Nursery Trade Association | 27 | | X | | X | | |
| Canadian Farm and Industrial Equipment Institute | 28 | | | | | | |
| Canadian Agricultural Chemicals Association | 29 | | | X | | X | |
| Grocery Products Manufacturers of Canada | 30 | | | | | | |
| Meat Packers Council of Canada | 31 | | | | X | | |
| Retail Merchants Association of Canada | 32 | | | | | | |
| Retail Countil of Canada | 33 | | | | | | |
| Canadian Restaurants Association | 34 | | | | | | |
| Consumers Association of Canada | 35 | | | | | | |

| Non-Government Organizations in the Canadian Agricultural and Food System | | Crop Insurance | Marketing and Market Regulation | | | | | Product, Grading, Labeling and Inspection |
|---|---|---|---|---|---|---|---|---|
| | | | Market Information | Marketing Boards | Stabilization | Storage Assistance | Cooperative Marketing | |
| Canadian Federation of Agriculture | 1 | X | X | XX | X | | X | |
| National Farmers Union | 2 | | | X | X | | X | |
| Canadian Seed Growers Association | 3 | X | X | | | | | X |
| Canadian Cattlemen's Association | 4 | | X | X | X | | | X |
| Dairy Farmers of Canada | 5 | | X | X | X | | X | X |
| Canadian National Livestock Records | 6 | | | | | | | |
| Joint Beef Breeds of Canada | 7 | | | | | | | |
| Canadian Swine Breeders | 8 | | | | | | | |
| Canadian Hatchery Association | 9 | | | | | | | |
| Canadian Horticulture Council | 10 | | X | X | X | X | X | XX |
| Canadian Egg Producers Council | 11 | | X | X | | | | X |
| Canadian Poultry and Egg Processors Council | 12 | | | X | | | | X |
| Canadian Poultry and Egg Council | 13 | | | X | | | | X |
| Canada Grains Council | 14 | | X | | X | X | | X |
| National Dairy Council of Canada | 15 | | X | | | | | X |
| Rapeseed Association of Canada | 16 | X | X | | | | | X |
| Canadian Pork Council | 17 | | X | X | | | | X |
| Canadian Broiler Council | 18 | | | | | | | |
| Agriculture Institute of Canada | 19 | X | | | | | | X |
| Canadian Council of 4-H Clubs | 20 | | | | | | | |
| Canadian Fruit Wholesalers Association | 21 | | X | X | | | X | X |
| Canadian Seed Trade Association | 22 | | X | | | | | X |
| Canadian Fertilizers Association | 23 | | | | | | | |
| Canadian Food Processors Association | 24 | | X | | | | | X |
| Canadian Federation of Farm Equipment Dealers | 25 | | | | | | | |
| Canadian Feed Manufacturers Association | 26 | | | | | | | X |
| Canadian Nursery Trade Association | 27 | | X | | | | | X |
| Canadian Farm and Industrial Equipment Institute | 28 | | | | | | | |
| Canadian Agricultural Chemicals Association | 29 | | | | | | | X |
| Grocery Products Manufacturers of Canada | 30 | | | | | | | |
| Meat Packers Council of Canada | 31 | | X | | | | | X |
| Retail Merchants Association of Canada | 32 | | | | | | | |
| Retail Council of Canada | 33 | | | | | | | |
| Canadian Restaurants Association | 34 | | | | | | | |
| Consumers Association of Canada | 35 | | | X | | | | X |

| Non-Government Organizations in the Canadian Agricultural and Food System | | Trade | | | External Aid | Transportation | Taxation |
|---|---|---|---|---|---|---|---|
| | | Promotion | Tariffs and N.T.B.'s | International Agreements | | | |
| Canadian Federation of Agriculture | 1 | X | X | X | X | X | X |
| National Farmers Union | 2 | | X | | | X | X |
| Canadian Seed Growers Association | 3 | X | X | X | | | |
| Canadian Cattlemen's Association | 4 | X | X | X | | X | |
| Dairy Farmers of Canada | 5 | X | X | | | | |
| Canadian National Livestock Records | 6 | | | | | | |
| Joint Beef Breeds of Canada | 7 | X | | | | | |
| Canadian Swine Breeders | 8 | X | | | | | |
| Canadian Hatchery Association | 9 | X | | | | | |
| Canadian Horticulture Council | 10 | XX | X | X | | X | X |
| Canadian Egg Producers Council | 11 | X | | | | | |
| Canadian Poultry and Egg Processors Council | 12 | | | | | | |
| Canadian Poultry and Egg Council | 13 | X | | | | | |
| Canada Grains Council | 14 | X | X | | | X | |
| National Dairy Council of Canada | 15 | X | X | | | | |
| Rapeseed Association of Canada | 16 | X | | | | | |
| Canadian Pork Council | 17 | X | | | | | |
| Canadian Broiler Council | 18 | X | X | | | | |
| Agriculture Institute of Canada | 19 | | | | X | | |
| Canadian Council of 4-H Clubs | 20 | | | | | | |
| Canadian Fruit Wholesalers Association | 21 | X | X | | | | |
| Canadian Seed Trade Association | 22 | X | X | | | | |
| Canadian Fertilizers Association | 23 | X | X | | | | |
| Canadian Food Processors Association | 24 | X | X | | | | |
| Canadian Federation of Farm Equipment Dealers | 25 | X | X | | | | |
| Canadian Feed Manufacturers Association | 26 | X | X | | | | |
| Canadian Nursery Trade Association | 27 | X | X | | | | |
| Canadian Farm and Industrial Equipment Institute | 28 | X | | | | | |
| Canadian Agricultural Chemicals Association | 29 | X | X | | | | |
| Grocery Products Manufacturers of Canada | 30 | X | | | | | |
| Meat Packers Council of Canada | 31 | X | X | | | | |
| Retail Merchants Association of Canada | 32 | X | | | | | |
| Retail Council of Canada | 33 | X | | | | | |
| Canadian Restaurants Association | 34 | X | | | | | |
| Consumers Association of Canada | 35 | | | | | | |

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