



MARITIME Series

MONOGRAPHS

Maurice Beaudin

The Agri-Food Industry in Atlantic Canada: Recognition and Development



INSTITUT CANADIEN DE RECHERCHE SUR LE DÉVELOPPEMENT RÉGIONAL
THE CANADIAN INSTITUTE FOR RESEARCH ON REGIONAL DEVELOPMENT



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Theme

In most countries, the agriculture and agri-food sector is regarded as highly strategic. Proof of this can be found in the excessive protectionism that is weighing down the agricultural sector and the inability of major trading nations to do anything about it. As a consequence, governments are paying special attention to this sector, especially since it has multiple links with other segments of the economy, from upstream to downstream, and is traditionally established in less industrialized regions, often in rural or semirural areas. The field of agri-food has therefore a very special importance which many studies and analyses seek to demonstrate.

The present study is no exception. The result of a collaborative CIRRD-ACOA project, it has several goals, one of which is to promote this important segment of Atlantic Canada's economy. Even though agriculture and agri-food constitute a highly promising sector, their potential at the regional level is still unexplored and to some extent even unrecognized. It is important to understand the reasons underlying this situation and, more importantly, to bring to light the real capacities of this industry as well as the challenges it faces within both Canada and the Atlantic provinces.

Unlike other regions that are more densely populated and therefore able to absorb a large proportion of food production, Atlantic Canada offers only a small market to regional businesses. To survive and thrive in the world economy, the region's agricultural and agri-food businesses must target external markets, a policy they are increasingly pursuing. On the whole, the agri-food businesses in Atlantic Canada have been very successful at carving out for themselves a share of the markets. Although they carry a heavier debt load than the same businesses elsewhere in Canada, they maintain a high level of competitiveness and can be found in increasingly diversified and innovative market niches, a trend that is confirmed by the expansion of markets in which regional products are sold. Having had a major impact on several subregions, the agri-food industry has been shown to play a strategic role in the regional economy.

That said, the agri-food world is rapidly changing. The appearance of new technologies, the development of integrated marketing chains, the concentration of intermediaries and large distribution systems, changes in food habits, and the expansion of product quality and control policies are all leading to profound changes in interbusiness relations within agri-food systems, from upstream to downstream. Understanding these changes is also important in evaluating both the potential of the sector and the challenges it faces. As well, such changes demand adjustments in the areas of production, management, and distribution as well as regulation and policies. Combined with evolving and more demanding consumer behaviour, these changes present special challenges to the region's farmers, industrial processors, distributors, and retailers while at the same time offering good prospects for those who wish to take advantage of them. It is important, therefore, to define these challenges properly in the context of Atlantic Canada and to chart courses of action that are likely to provide direction to the actors who are directly or indirectly involved in the field of agri-food.

About the Author

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The views expressed in this document are exclusively those of the author, who assumes full responsibility for the report's content and analyses.

Sources of Information

Because of the complexity and highly strategic nature of the field of agriculture and agri-food, it has been widely and intensively researched. In several industrialized countries, including Canada and the United States, agriculture is thoroughly studied and for decades has even been the subject of a special section of the census. We therefore had at our disposal a considerable number and variety of studies, analyses, and reports produced by government bodies both here in Canada and internationally.

Among the material we refer to are data from Canada's Department of Foreign Affairs and International Trade contained in the electronic information network STRATEGIS, the data and analyses produced by Agriculture and Agri-Food Canada and Statistics Canada (Agriculture Division, census, and the *Annual Survey of Manufactures*), and the data and studies produced by provincial ministries of agriculture, in particular by Quebec, whose analyses of the challenges facing the sector are highly instructive. We have also drawn extensively on documents from different industry associations, both provincial and national. For international references, we are particularly indebted to the U.S. Department of Agriculture (USDA), especially the Economic Research Service (ERS), for its many analyses of the field of agri-food, as well as to the Food and Agriculture Organization (FAO) of the United Nations for its international reports and analyses. Finally, we drew on several additional sources, such as information gathered from consultants, businesses in Atlantic Canada and elsewhere, specialized institutes, research centres and professional associations, and certain paper and electronic commercial and documentary databases.

Though highly detailed, these various sources of information still did not provide a satisfactory picture of the dynamics at work. To adequately reflect the challenges faced by the agri-food sector, we had to go beyond the statistical analyses, to the many actors in the field, whom we consulted in discussion groups and in sectoral meetings. Their involvement in the study was greatly appreciated.

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Introduction

The region of Atlantic Canada is home to 7.6 percent of the Canadian population, but has only 3.5 percent of the country's farms and 1.2 percent of its area under crops. At first glance, its maritime geography, characterized by a rocky narrow coast, appears ill-suited to agriculture. Moreover, it is the only major region in the country that has no type A (highest category) soil. On the positive side, however, it does have several high-yield areas that produce a surprising variety of crops. Although access to new cultivation technologies and methods has certainly contributed to the expansion and diversification of agriculture in the region, that diversification is more dependent now than in the past on trade opportunities than on soil productivity. Moreover, the average acreage of the region's farms is lower than in the country as a whole. The limited regional market, due to low population density and the absence of large cities, has been a serious and longstanding obstacle to the expansion of the industry.

In contrast to the large-scale production which characterizes the agriculture sector of other regions in the country, productivity in the Atlantic provinces relies on a relatively diversified processing industry which is increasingly focused on external markets. For several decades, regional producers and processors have been able to take advantage of new technologies and ongoing changes in the economy to successfully meet a growing demand for food products. The region generates 3.6 percent of national cash receipts from crop and animal production, while the food-processing sector (except for fish and seafood) accounts for 5.1 percent of Canadian manufacturing shipments of agri-food products and 6.0 percent of value added. The industry is focusing increasingly on value-added production, which in the period 1992–2001 represented an average of 38.2 percent of the value of the region's shipments, compared with 33.6 percent in Canada.

Although it is not always acknowledged, the agri-food industry unquestionably occupies an important place in the economy of the Atlantic provinces. Despite periods of rationalization, there are 9,500 crop and animal-breeding farms in the region and 2,800 other

operations which together employ approximately 15,000 workers. In 2000 agriculture generated 460,000 workweeks; more than half of these jobs (55 percent) were full-time on a year-round basis. More than \$208 million in wages was paid in the regional agricultural industry, and an additional \$122 million was paid by farm operators for fixed-price or contract work.¹ These figures were corroborated by the 2001 census, which reported that 27,370 people in the four provinces earned most of their livelihood from agriculture, accounting for \$455 million in employment income.² In the past several years, farm cash receipts, excluding payments from programs, reached the respectable figure of \$1.3 billion, which is almost as much as the total value of fish and seafood landings, a figure that hovers around \$1.5 billion.³

Another interesting fact is that crop and animal producers rely heavily on inputs (goods and services). These are obtained from a vast array of suppliers, most of whom are from other sectors of the economy. In 2002 their expenditures on inputs alone reached \$942 million in Atlantic Canada, including 81 percent outside the agricultural field.⁴ In Canada, a more modest share (70 percent) of expenditures on inputs was made outside the agriculture sector. This primary sector therefore acts as a highly effective multiplier of employment and income. In the United States, for example, the Department of Agriculture (USDA) estimates that for every dollar spent on food, only \$0.19 goes to crop and animal producers. The rest goes to other sectors and is therefore considered a value added to basic activities.⁵ The spin-offs from the agricultural field are naturally higher in high value-added sectors, generally those that are oriented towards external markets. It is estimated that each dollar of exported agri-food products generates an additional \$1.46 in other sectors of the economy.⁶ We

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1. Statistics Canada, *Census of Agriculture* (Ottawa: Statistics Canada, 2001).
 2. Statistics Canada, *2001 Census of Canada*, data on employment and income by industry (special order).
 3. These revenue figures for the agriculture sector differ from those of both Agriculture Canada and the census. This is because a substantial proportion of the revenue of farm operators and workers comes from other activities. See Agriculture and Agri-Food Canada, Farm Income and Adaptation Policy Directorate, Strategic Policy Branch, *Farm Income, Financial Conditions, and Government Assistance: Data Book* (Ottawa: Statistics Canada, March 2002); Fisheries and Oceans Canada, statistics on landings.
 4. Statistics Canada, Agriculture Division, *Agriculture Value Added Account* (Ottawa: Statistics Canada, May 2003), cat. no. 21-017-XIE.
 5. Economic Research Service (ERS)/USDA, *Farm Production Expenditures 2000 Summary* (Washington, D.C.: USDA, July 2001).
 6. According to William Edmondson, "Economic Activity Triggered by Food and Agricultural Trade," *Rural America* 17, no. 1 (Spring 2002): 45–48.

will examine the spin-offs from the region's agri-food industry in a later section of this study.

In addition, production in the agriculture sector supplies a rapidly growing food-processing and manufacturing industry. This diversified industry records annual sales of \$3 billion, and its exports are increasing every year (22 percent of production in 2001 versus 7 percent in 1992).⁷ It must be said, however, that a large share of inputs, particularly industrial products destined for processing, comes from outside the region. In any event, according to the 2001 census the processing and manufacturing of food products other than fish directly employs fifteen thousand people in the region and represents \$371 million in employment income.

Have these processors and manufacturers performed well, and have their primary-product suppliers, the crop and animal producers been successful? During the last five years (1999–2003), agricultural operations in Atlantic Canada have maintained an average operating margin of 16.4 percent, compared with 13.6 percent at the national level.⁸ As for regional processors and manufacturers, for several years their gross margin has outdistanced the Canadian average by a few percentage points. The economic and financial aspects of the industry's sectoral bases will be covered in more depth in another section.

These few figures attest to the strategic importance of the agri-food industry in Atlantic Canada. They show that its direct economic impact is very significant, similar to that of the fishing and fish-processing sector, and further demonstrate that on the whole, the region's agri-food businesses have no cause to envy the success of their counterparts in other regions of the country. Although they report a heavier debt load, they also maintain a high degree of competitiveness. In the end, however, even though the agri-food industry has been long established in the region, it is far from gaining credibility.

Nevertheless, efforts need to be made to increase productivity in several segments of the industry (this will be examined later in the study). It should be noted that the overall performance of the agri-food sector depends in large part on a few key subsectors, particularly dairy products and especially potato processing, which is dominated by large vertically integrated businesses. Even so, we will see that

7. According to export data from Industry Canada's STRATEGIS data bank.

8. Ratio calculated by the author based on Statistics Canada, *Agriculture Economic Statistics* (Ottawa: Statistics Canada), cat. no. 21-603-XPE; Agriculture and Agri-Food Canada, *Farm Income*.

a surprising number of businesses are found in innovative market niches and that they capitalize on the segmentation of demand — something that stakeholders in the regions, even within the agri-food industry, do not always realize. However, unlike other regions in Canada where the agri-food industry enjoys a prominent place in the news, this subject gives rise to little informed debate within the Atlantic provinces. What is the reason for this lack of interest in a field that has such strategic importance for the regional economy? Is it due to the absence of a critical mass, the result of both the segmentation of the industry at the regional level and the relatively small size of the Atlantic provinces? Is it because of the absence of large sectoral organizations capable not only of projecting a coherent image of the sector, which is still too often seen as traditional, but of injecting it with a new dynamism? Or is it due in part to the dominant position of other industries such as fishing and logging?

In each of the Atlantic provinces, the fishing industry is often in the headlines, frequently eclipsing other activities that are important to the region. The both modern and traditional nature of the fishing sector; its geographical spread; its large workforce, which benefits in large part from income transfers; the intense and unpredictable cycles of the resource, to which it must accommodate itself throughout the seasons; and the robustness of its exports confer on it a certain privilege and earn it vast media coverage that overshadow other sectors, including agri-food. Other activities (petroleum development, knowledge-based industries) also receive special attention, though for other reasons, which raises them in the same way to the level of strategic sectors, or even economic pillars.

Clearly there is more to it than that. Other factors contribute collectively to concealing the strategic nature of the agri-food industry within the regional space. Among them is the heightened interest of provincial governments in megaprojects centred on natural resources, an interest arising from their potential for developing skills and advanced technologies. Another factor is the emergence of so-called new-economy businesses, including call centres, which in the space of a decade have given a second wind to several regions lacking in employment diversification. The 1990s boom in new-economy businesses (information and communications coupling) could have hurt traditional sectors such as agri-food.⁹

9. A recent article entitled "Agroalimentaire: une image à changer," a virtual *Guide de l'emploi* (employment guide) for Quebec, examined the decrease in popularity of traditional sectors which are unable to meet their needs for skilled workers. A large part of the work of agri-food leaders consists in promoting their industry and giving it a positive and dynamic image. See <http://ge.monemploi.com>, April 2003.

Furthermore, the agriculture industry is not always popular with the general public, which holds it responsible for problems of air pollution and the contamination of watercourses. Unfortunate incidents such as the single case of mad cow disease¹⁰ or the contamination of rivers or groundwater resulting from the excessive use of herbicides and pesticides may also contribute to suspicions about crop and animal production practices, even here in our communities.

Hence the hostile rejection of all forms of unconventional hybridization (genetically modified organisms or GMOs),¹¹ in spite of their promise to increase the productivity of certain operations without compromising food security or safety. The government of Prince Edward Island, on the basis of unfavourable scientific assumptions and the European Union's objections to GMOs, was planning to exclude the province from any genetically modified production — a first in Canada. In reaction to this rejection of mass-produced products labeled as industrial and said to be “fed with chemicals,” the general public has embraced biofood products or anything that resembles natural foods, such as fruits and vegetables produced without herbicides or pesticides, the meat of “traditional” farm animals sold at farmers' markets, or the local products produced by small-scale, cottage-type operations using methods that are considered nonindustrial. As part of this trend, various market niches have developed such as for organic products, whose growth in sales has been meteoric.¹²

Another factor that may undermine the agricultural world is undoubtedly the continuous decline in the number of farms and agricultural operations. This trend has been confirmed in each census, ultimately sending the population the negative message that agriculture is becoming extinct. Although it is true that the decrease in the number of agricultural operations has been unrelenting, it is largely

10. Although only one case in Canada and another in the United States have been detected, it is the hitherto excellent reputation of the cattle industry as a whole that is at stake.

11. These are organisms or foods whose genes have been modified or transferred to introduce a new characteristic (resistance to parasites and accelerated growth). In theory, these changes may take place through ordinary natural selection or be precipitated by modern genetic engineering. In practice, these expressions describe products created through genetic engineering. Drawn from http://www.ogm.agriculture.gouv.fr/savoir_plus/fiche1.htm.

12. In the United States, sales of organic foods increased from \$1 billion to \$5.5 billion between 1990 and 1998 and more recently have been increasing by from 25 to 30 percent annually. The market is, of course, smaller in Canada (sales of \$500 million to 800 million), but is growing just as rapidly. In addition, consumers in the European and Asian markets are already more aware of the quality and healthfulness of food products. See “Business Facts,” *Organic Trade Association* (June 2000); AVAC, *Organic Food Industry: Highlights from the Conference Going Organic: Opportunities for the New Millennium*. Fact Sheet. http://www.avactd.com/Fact_Sheets/AVAC-organicindustry.pdf.

offset by the acreages under crop, the average size of operations, and the increase in yields. Overall, what can be seen is an industry that is consolidating but is nevertheless highly diversified and expanding, an economic sector which on the whole yields very respectable returns and continues to expand its markets.

On the basis of these considerations, the present study has several goals, which will be covered in six stages. First, it is important to clearly define what is meant by the agri-food world. From the farm to the consumer's plate, a large number of stakeholders intervene in highly diverse sectors or industrial segments. One might say that this is nothing new, but we must be conscious of them and, more importantly, be able to gauge the interactions between the diverse systems involved.

Next, we will take stock of the main trends that are helping to shape the agricultural and agri-food world and, even here in the Atlantic provinces, to dictate the conduct of businesses which must meet the expectations and needs of the various levels of the industry. The appearance of new production technologies, in particular biotechnologies, the development of new marketing systems (direct sales, electronic commerce), the concentration of intermediaries (wholesalers, processors) and of large distribution, and the development of product quality and control policies (health safety, traceability) are all leading to profound changes in the interbusiness relations, from upstream to downstream, of the agri-food systems.¹³ One example taken from the processing of agri-food products is the technological changes that have encouraged the expansion and mergers of businesses.

These changes raise many questions at the level of both private decision-makers (supply contracts, organization of product flow, information exchanges) and public decision-makers (regulation of business practices, trade regulation, structuring of supply, capital assistance). These changes of a technological, environmental, and business nature require adjustments to production, management, and distribution as

13. By "system," we mean the grouping around a single production sector (e.g., pork, poultry, legumes, etc.) of all the actors (production, processing, distribution, industry services, research and development, and government management) who have an interest in working together in order to improve the performance of their sector on domestic and foreign markets. Thus, in Quebec, as a result of a consensus reached by actors in the agri-food industry, a new consultation dynamic called a "systems approach" was implemented in 1992. Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec, "Qu'est-ce que l'approche filière?"; <http://www.agri.gouv.gc.ca/ae/filieres/filquoi.htm>.

well as to regulation and policies. Eventually, however, it is the expectations and preferences of the consumer that dictate the response of farm operators and processors. In this regard, the prospects are encouraging. The demand for food products is changing rapidly, making it more difficult to program supply but, at the same time, opening new avenues for regional operators and producers. It is important to define these issues clearly in the context of Atlantic Canada.

Third, we will present a profile of the sectoral bases of the agri-food industry in the four provinces. Beyond the structural profile, this analysis allows us to put the main agri-food segments into perspective by highlighting the two major components: crop/animal production and processing/manufacturing of food products. Among the themes examined in chapters 3 and 4 are business structure, productivity, innovation, and skill requirements.

Unlike other regions that are more densely populated and therefore able to absorb large quantities of food production, Atlantic Canada offers only a limited market to regional businesses. Clearly, to survive and thrive in the world economy, the region's agricultural and agri-food businesses must target external markets. Hence the importance in the present study of examining dynamics and business prospects in the context of changing regulations. Although the prospects at the international level seem to be promising, we must nevertheless consider the Canadian market. In this regard, it is possible to sell certain products locally by practising what is called *import substitution*.¹⁴

The fifth part of the study will therefore be devoted to a business analysis in the context of a reorganization of the distribution chains for agri-food products. We will see that over the last decade Atlantic producers have succeeded in positioning themselves favourably on the export market. However, these gains remain subject to the vagaries of the international economic situation and, perhaps even more, to the capacity of regional actors to gain access to the major distribution-marketing networks.

Finally, the sixth part of the study will concentrate on the socio-economic impact of the agri-food industry, including related systems or sectors. The analysis of the economic impact will help us to assess the contribution of this industry at the provincial and regional levels.

14. By "import substitution" we mean the share of commodities and inputs destined for agriculture and agri-food processing that actually originate in the regional space as opposed to being imported. Thus what is normally purchased from elsewhere is produced locally.

Thus, we will be able to bring out the interrelations between the sectoral bases and other sectors of the regional economy. At the same time, this analysis should serve as a tool to raise the profile of this sector.

We will conclude our study with a consideration of the current challenges facing the agri-food industry in each of the Atlantic provinces. We will focus our attention on the profitability and competitiveness of the basic systems, product innovation, regulation, and trade issues as well as the institutional support given to the industry.

Chapter 1

The Agri-Food System: What Is It?

Although most of their products have the same end use, the so-called agri-food industries form a highly heterogeneous universe. Together they constitute not only a sector or an industry but a combination of systems that operate within sectoral bases (primary product suppliers and food product processor-manufacturers). The latter incorporate or supply a quite complex and impressive distribution sector as well as a whole range of related monitoring and support activities. The basic systems differ from each other as much in their production pattern and management styles as in their level of interaction with the production and distribution components.

To paint a picture of these sectors, from upstream to downstream, or even to group them together into a common terminology is no easy task. Moreover, the terminology relating to food products and industries is varied and changing, which makes it even more difficult to adopt a typology that is universally recognized. How then can the importance of the agri-food industry be accurately assessed? How can we assess the role and contribution of each of the segments that make up this vast economic sector, which extends from the farm to the consumer's plate? Before examining a typology that meets the needs of this study, we will determine what the field of agri-food consists of, the terminology that is reserved for it, and an appropriate typological framework.

■ A Complex Industry Consisting of Several Systems and a Vast Array of Processes

The literature on the subject generally uses the term *agri-food* or *agri-business* to designate industries that specialize in the production, processing, and distribution-marketing of foods. This term reflects a more modernist conception of development, which contrasts with Rostow's model of economic growth, in which agriculture and industry are viewed as two separate sectors, the latter being the precursor of

development.¹⁵ This model, which claims that growth is no more than a fairly gradual shift from an agricultural to an industrial economy, is thus no longer appropriate.

The contribution of agriculture to industrialization has been reassessed because its profile has become increasingly similar to other industrial sectors. Since the 1960s, agriculture has become industrialized by replacing labour with capital and by increasing inputs. This led to a decrease in production costs by increasing productivity and yields. Hence the notion of the “tertiarization” of agriculture, since this sector is incorporating more and more concepts and methods from the tertiary sector.

The complex technologies used in agriculture, the vertical integration of businesses, their management style, their marketing techniques and means, as well as the regulatory obligations imposed on the agricultural world are all factors that it shares with other goods-producing industries. According to the Food and Agriculture Organization of the United Nations (FAO), “The industrialization of agriculture and development of agroprocessing industries is [sic] a joint process which is generating an entirely new type of industrial sector.” This sector is commonly called the *agroprocessing industry*.¹⁶

As the FAO makes clear, however, it is still difficult to state precisely what constitutes an agro-industrial activity since “the impact of innovation processes and new technologies suggests a widening of the range of agro-industry inputs that could be considered, including biotechnological and synthetic products, for example.”¹⁷ Moreover, FAO’s definition of the agroprocessing industry goes well beyond the framework that is usually reserved for this segment of the economy even in Canada. In fact, in the agroprocessing industries, FAO includes not only the food product sectors but also the sectors of textile, wood products, and rubber products.¹⁸ The definition is slightly more restrictive in the United States, for example, where the Department of Agriculture (USDA) generally refers to “farm and farm-related industries.” These consist of basic agriculture and the major

15. W. W. Rostow, *The Stages of Economic Growth* (Cambridge: Cambridge University Press, 1960).

16. FAO, *The State of Food and Agriculture, 1997* (Rome: FAO, 1997). “A common and traditional definition of agroprocessing industry refers to the subset of manufacturing that processes raw materials and intermediate products originating from agriculture, forestry and fisheries.”

17. *Ibid.*, chap. 3: 3.

18. *Ibid.*, 2.

processing sectors, including the textile and leather products sector.¹⁹ In Canada, the agri-food system comprises the combined sectors of crop and livestock production, food product processing, transportation or distribution, and retail sale (groceries and other food stores), as well as the restaurant industry (including food services). Beverages also fall within this range.

Clearly, the simple classification of agri-food industries can be a complex operation since the terminology aimed at describing and measuring this major area of activity varies widely from country to country and even from province to province. From upstream to downstream, various terms are used to define all the industries related to foods. Depending on the type of industries or the industrial segment involved and depending on the country, the terms used will be *agri-food sector*, *agricultural* or *agri-food systems* (Canada), *agroprocessing industry* (FAO), *biofood industry* (Quebec), or *food and fiber system* (United States). Each of these designations refers to a more or less restrictive combination of sectors related to the production, processing, and distribution of food products.

■ A Typological Framework Adapted to the Canadian Case

Given this situation, it is not surprising to see so much confusion or even rash interpretations when it comes to assessing the field of agri-food and comparing it with other industries or making comparisons between provinces or regions. Comparisons between countries are even more difficult, particularly in the area of so-called value-added productions.²⁰ In fact, everything depends on the way the agri-food sector is described, whether it is based on the type of activity (crop or livestock production systems, processing, manufacturing, etc.) or the type or nature of food products (based on their stage in the processing and distribution chain). It appears essential, therefore, that a common, practical, and clearly defined terminology be adopted in order to grasp all the dimensions of this important segment of the regional economy.

19. USDA, Economic Research Service (ERS), *Farm and Farm-Related Employment: Industry Groups and Components* (Washington, D.C.: USDA, May 2003). Information Note.

20. Thus, it is reported by the ERS that “the size of the global food market is difficult to measure precisely given varying national definitions of the food sector and the range of venues in which food is sold (wholesale, manufacture, retail, or food services).” See Mark Gehlhar and Anita Regmi, “Shaping the Global Market for High-Value Foods,” in *Agricultural Outlook* (Washington, D.C.: USDA, December 2002), 38.

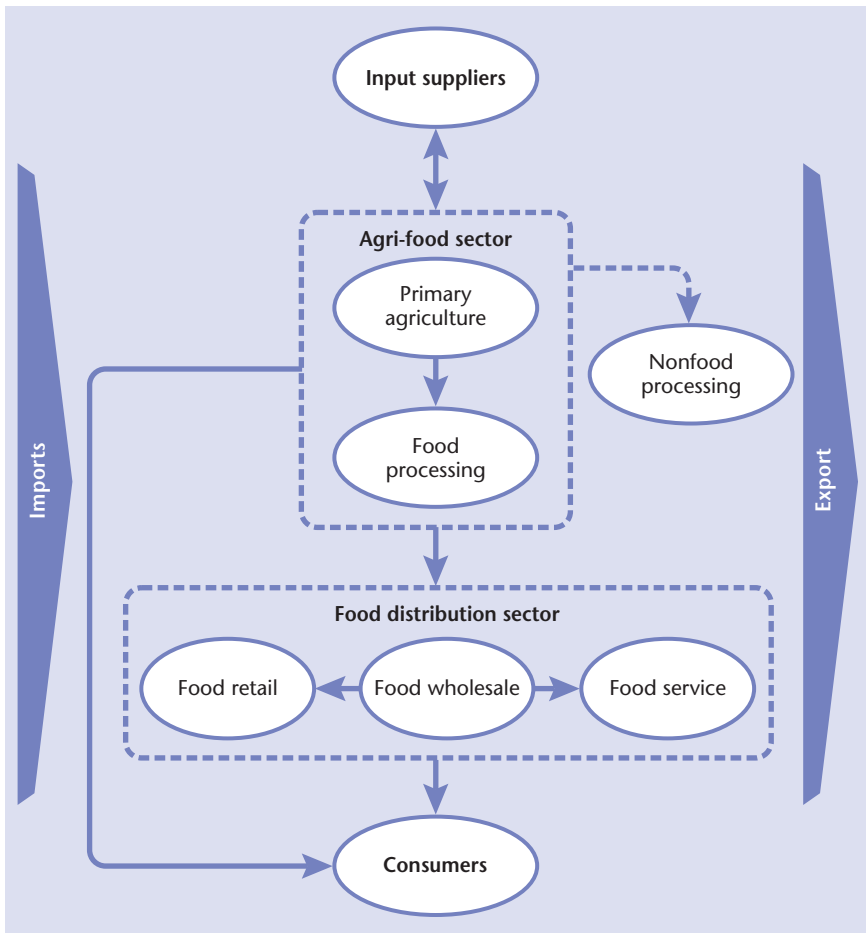
In Canada, the agri-food industry generally falls into two groups, that is, primary agriculture and livestock breeding, on the one hand, and food manufacturing on the other. This is what is generally meant by the basic agri-food system.²¹ However, the dynamic prevailing within the basic systems is strongly influenced by the trends and decisions which are made further downstream, at the level of the distribution and marketing of food products. Thus, to assess the state of the industry as a whole, we must look beyond the basic systems.

First, we should distinguish between the terms *sector* and *system* as they relate to agri-food. While the first term essentially concerns the agricultural bases and processing-manufacturing, the second term revolves around a vast, complex, and integrated chain of production and service suppliers, a chain which begins at the farm, advances through processing, marketing, and distribution, and ends with food services (see figure 1). The agri-food system encompasses the entire supply and sale of primary products as well as processed or manufactured food products, from farm inputs and basic products to highly processed products such as multirange brand, packaged products. It thus involves a wide range of suppliers of products and services (inputs) operating within the different systems.

The first level is represented by agri-suppliers together with the crop and animal farmers who make up the agricultural sector. In addition to agricultural input suppliers, this first level includes industries based on the following: vegetable, fruit, and potato farming, cattle farming and poultry breeding, controls of transformation processes, veterinary health and hygiene services, and waste disposal systems and equipment. In Atlantic Canada, there are approximately 9,500 farms specializing in different types of breeding and cultivation, as well as several hundred related and support businesses. These include agricultural input suppliers such as cattle feed, veterinary services, and other services to the industry. The recent emergence of a number of new businesses in the field of specialized cultivation and breeding should be noted, in particular the cultivation of small fruits (blueberry and cranberry) and other horticultural productions, mink breeding, wineries, and the production of health or organic foods.

21. By "system" we mean the common characterization of primary and secondary activities and services related to the production, processing, and marketing of food products, including industry support services. Thus, we refer to the beef system, poultry system, meats systems, etc.

Figure 1
The Agriculture and Agri-Food System in Canada



Source: Agriculture and Agri-Food Canada, Research Analysis Directorate, *An Overview of the Canadian Agriculture and Agri-Food System* (Ottawa: Agriculture and Agri-Food Canada, 2003).

The second level includes the processor-manufacturers who essentially carry out the primary processing of agricultural products and the manufacturing of fine foods, dairy products, bakery products, beers and other beverages, confectionery products, food-based specialties, snacks, and chips, as well as industrial products serving as inputs in other food and beverage sectors. There are a total of more than five hundred businesses in the four Atlantic provinces that form the core of the agri-food industry by acting as links between the various systems, both upstream and downstream. Processors and manufacturers are divided into twenty or so sectors or industries that involve a wide range of processes. Some industries are standard and require a large workforce (industries based on bakery products, fruits and vegetables, and primary meat processing), while others use highly automated and sophisticated methods (industries based on oilseeds, dairy products, and beverages). However, there are no clear distinctions in this field because several industries include both traditional, family-type businesses that are labour intensive and other more modern, highly-capitalized, vertically and horizontally integrated businesses.

Lastly, grouped under the same banner are the sectors responsible for the distribution of foodstuffs and food products to the many sales outlets and to consumers. In this analysis, we should emphasize the strategic role of wholesale distributors (wholesalers) and retail distributors (retailers), while keeping in mind that a large number of stakeholders (brokers, purchasing pools, internal agencies of large businesses, and cooperatives) help to ensure the flow of goods and services at the levels of both supply and shipment to markets.

To return to the agri-food system, it should be noted that the terminology used comes from the North American Industrial Classification System (NAICS 1997) to which Canada subscribes. Based on this international classification, primary agriculture consists of crop production (NAICS code 111) and animal production (NAICS 112). Food manufacturing (NAICS 311 or SIC 10) is composed of nine different industries subdivided into more than twenty subsectors (NAICS codes at the five-digit level). This large group of industries includes those activities that specialize in the processing and manufacturing of food products, whether or not they pertain exclusively to crop or animal production. Thus, fish products, including aquaculture products (if processed), can be incorporated into this group (they have been excluded, however, from the present analysis).

To clearly appreciate the scope of the agri-food field, we have presented these various sectors by major industrial group. Under the NAICS, the sectors are grouped together in more detail as follows:

Primary Agriculture

- 111 – **Crop production** (5 subsectors)
 - 1151 – Support activities for crop production
- 112 – **Animal production** (6 subsectors)
 - 1152 – Support activities for animal production

Processing-Manufacturing

- 311 – **Food Manufacturing** (22 subsectors)
 - 3111 – Animal food manufacturing
 - 3112 – Grain and oilseed milling
 - 3113 – Sugar and confectionery product manufacturing
 - 3114 – Fruit and vegetable preserving and specialty food products
 - 3115 – Dairy product manufacturing
 - 3116 – Meat product manufacturing
 - 3117 – *Seafood product preparation and packaging* (excluded from the present analysis)
 - 3118 – Bakeries and tortilla manufacturing
 - 3119 – Other food manufacturing
 - 3121 – Beverage manufacturing (including soft drinks and alcoholic beverages)
 - 3122 – Tobacco manufacturing

In addition to these basic agri-food sectors, the system also includes a number of related sectors (the manufacturing of by-products or of products serving as inputs in the agricultural and processing industry, wholesale trade and distribution of food products, retail sale). These are represented in the following industry groups:

Distribution-Marketing

- 4111 – Farm product wholesaler-distributors
(primary products)
- 4131 – Food wholesaler-distributors (processed products)
- 4132 – Beverage wholesaler-distributors
- 4133 – Tobacco product wholesaler-distributors
- 4171 – Farm and lawn and garden machinery
and equipment wholesaler-distributors
- 4183 – Agricultural supplies wholesaler-distributors
- 41911 – Farm product agents and brokers
- 41913 – Food, beverage, and tobacco agents and brokers

Retail Sale and Restaurant Service

- 4451 – Grocery stores (supermarkets and other
grocery stores, convenience stores)
- 4452 – Specialty food stores (butchers, fish shops,
vegetable markets, bakeries, and confectioneries)
- 7221 – Full-service restaurants
- 7222 – Limited-service eating places
- 7223 – Special food services (contractors, caterers, etc.)

Other

- 49313 – Farm product warehousing and storage
- 54194 – Veterinary services

Based on the NAICS, the agri-food industry in Atlantic Canada directly employs approximately 145,000 workers and generates \$2.6 billion (see table 1). This accounts for 13.4 percent of jobs and 8.9 percent of employment income in the regional economy (13.6 percent and 7.8 percent respectively in Canada as a whole). As we shall see below, however, there are marked differences between the provinces.

Thus, the present analysis covers a dozen large sectors that include various systems. It is not our intention to study all of these areas of activity in depth, but only to take account of them in the overall assessment of the system. We will examine in more detail the primary sectors of crop and animal production as well as several segments related to the processing and manufacturing of food products. In accordance with the NAICS, we will retain this typology in the analysis of the agri-food industry in Atlantic Canada. We will, however, omit fish processing (3117), a leading sector in the food industry in at least three of these provinces, since the fishing and fish-processing industry has already been examined in depth elsewhere.²²

22. Maurice Beaudin, *Towards Greater Value: Enhancing Eastern Canada's Seafood Industry* (Moncton: The Canadian Institute for Research on Regional Development, 2001).

Table 1
Contribution of Major Components of the Agri-Food System, Atlantic Provinces, 2001

Agri-Food Sectors and Subsectors	Number of Workers	Aggregated Revenues (\$)	As a % of Agri-Food	
			Number of Workers	Aggregated Revenues
1110 Farms (1111-1129)	22,870	401,119,410		
Other crop and animal production activities	4,500	93,384,095	15.78	19.26
Primary agriculture (including support activities)	27,370	494,503,505	19.40	19.76
3111 Animal food manufacturing	650	29,009,725	0.45	1.12
3112 Grain and oilseed milling	115	4,188,615	0.08	0.16
3113 Sugar and confectionery product manufacturing	825	22,945,975	0.57	0.89
3114 Fruit and vegetable preserving and specialty food products	4,260	109,639,275	2.94	4.24
3115 Dairy product manufacturing	1,795	54,251,535	1.24	2.10
3116 Meat product manufacturing	3,260	83,695,150	2.25	3.42
3118 Bakeries and tortilla manufacturing	2,750	64,306,255	1.90	2.49
3119 Other food manufacturing	1,225	35,782,510	0.85	1.38
3121 Beverage manufacturing (including soft drinks and alcoholic beverages)	2,130	88,152,165	1.47	3.41
Total agri-food (processed)	17,010	496,739,630	11.74	19.21

4111	Farm product wholesaler-distributors (primary products)	155	2,591,625	0.11	0.10
4131	Food wholesaler-distributors	8,425	242,917,910	5.81	9.40
4132	Beverage wholesaler-distributors	795	20,276,890	0.55	0.78
4183	Agricultural supplies wholesaler-distributors	385	10,257,390	0.27	0.40
	Wholesale distribution of agri-food products	9,760	276,043,815	6.74	10.68
4451	Grocery stores	31,730	490,538,450	21.90	18.97
4452	Specialty food stores	2,150	37,070,650	1.48	1.43
4453	Beer, wine, and liquor stores	1,840	45,070,080	1.27	1.74
7221	Full-service restaurants	21,805	320,470,245	15.05	12.40
7222	Limited-service eating places	27,760	320,812,805	19.16	12.41
7223	Special food services	4,745	87,740,585	3.27	3.39
	Retail sale of agri-food products	90,030	1,301,702,815	62.13	50.35
	Agriculture and agri-food direct contribution	144,905	2,585,377,630	100.00	100.00

Source: Statistics Canada, 2001 census special data; compiled by the author.

Chapter 2

A Rapidly Changing Industry

The economy in general and the agriculture sector in particular have undergone major upheavals during the last decade, among them changes in demand; the appearance of new processing, preserving, and storage technologies; economic globalization stimulated by the opening of markets (free-trade agreements, inclusion of the agriculture sector in GATT negotiations) and the creation of the World Trade Organization (WTO); and the application of biotechnologies and a growing awareness of environmental protection and food safety. These developments did not happen spontaneously. Instead, they came together during the 1990s to substantially modify the economic order and especially industrial production. They swept through the world of agriculture and agri-food, and today the massive scale of these changes continues to transform certain segments of the agri-food sector. Moreover, in most industrialized countries this strategic sector is subject to strong protectionist measures and is heavily subsidized.²³

In an issue of *OECD Observer* published in 1998, Reza Lahidji wrote that there have been three major developments to which agri-food businesses must adjust: *change in demand*, *globalization of markets*, and, after the introduction of new cooking, packaging, transport, and storage techniques, the *emergence of biotechnology*. According to this author, “At all stages in the sector (production, processing, trade), businesses are becoming larger and are reshaping their relationships with

23. Since 1999, the Organisation for Economic Co-operation and Development (OECD) has used the notion of the producer support estimate (PSE) to measure the support that a country gives to agriculture. It is an indicator of the (annual) monetary value of gross transfers received by producers either directly or indirectly from government transfer programs or the surpluses that consumers must pay for a product because of import restrictions, for example. It shows that New Zealand is one of the least interventionist countries, with a PSE of 1 percent, compared with 16 percent in Canada, 20 percent in the United States, 38 percent in the European Union, and over 60 percent in Japan. See Robert Romain and Pierre Marcotte, *Évolution comparée du secteur agricole québécois à l'aube du XXI^e siècle : implications pour l'agroéconomiste* (Sainte-Foy: Centre de recherche en économie agroalimentaire, 2000); Wilfred Legg and Gérard Viatte, “Farming Systems for Sustainable Agriculture,” *OECD Observer*, no. 225 (June 2001).

one another. These are only the first results of far-reaching changes which are likely to intensify over the next few years — in consumer expectations, market size, policy and production techniques.”²⁴

Throughout the agri-food system, efforts to increase productivity and use available resources more effectively have allowed agricultural production to grow at a steady pace. In the entire OECD zone, agricultural production increased by 15 percent over the last fifteen years, while the area under crops decreased by one percent and the agricultural workforce by 8 percent. The real price (adjusted for inflation) of food products decreased by approximately one percent per year. This increase in production has been stimulated everywhere by expensive policies.²⁵

These changes are having an even greater effect on Canadian agri-food producers and processors because they depend to a great extent on export markets for their products. In this regard, a report on the Quebec food-processing industry recently outlined the following challenges:²⁶

- ▶ A stronger distribution sector
- ▶ A larger concentration of processing capacities
- ▶ A changing market characterized by growing competition
- ▶ Demanding consumers with particular preferences and requirements
- ▶ A growing necessity to prevent harm and risks
- ▶ The need to use processes that contribute to sustainable development
- ▶ The introduction of biotechnologies that produce impressive results but which raise concerns
- ▶ The workforce, the key element of competitiveness

24. Reza Lahidji, “The Agri-Food Sector in the 21st Century,” *OECD Observer*, no. 210 (February–March 1998): 28–31.

25. Romain and Marcotte, *Évolution comparée du secteur agricole québécois*.

26. Ministère de l’Agriculture, des Pêcheries et de l’Alimentation du Québec (MAPAQ), *L’industrie québécoise de la transformation alimentaire, une vision d’avenir à partager* (Quebec: MAPAQ, 2001).

Beyond the more obvious consumer concerns about food quality and safety, there are many other factors that influence the economic growth and viability of the agri-food industry. Some of these have been identified by the Ontario Agricultural Services Co-ordinating Committee:²⁷

- ▶ Transportation
- ▶ Impact of changing market structures
- ▶ Changing financial structures and access to capital
- ▶ Utility costs in a deregulated environment
- ▶ Availability of affordable, skilled, and trained agricultural workers
- ▶ Access to and management of information
- ▶ Advances in biotechnology
- ▶ WTO and other world trade agreements

Crop and animal producers and agri-food processors are thus confronted with a number of important trends, including the “forced” decrease in production costs,²⁸ the standardization (uniformity) of product characteristics, and maximum flexibility of operations. These structural adjustments have forced businesses to search for a critical size through alliances, mergers (vertical and horizontal integration), and partnerships. We will see that the influence of large distribution, which now dictates its conditions throughout the chain, is growing, as is the influence of food safety and environmental regulations, which are giving rise to a profound change in the organizational culture of both small and large businesses.

Beyond the trend towards concentration, the agri-food industry in the Atlantic provinces must continue to satisfy the rigorous standards aimed at protecting the environment and ensuring food safety; it will also have to adapt its management to the imperatives of a growing demand, one that is increasingly segmented and sophisticated, while

27. Ontario Agricultural Economics and Business Research and Services Committee (OAE&BRSC), “Sector Scan,” in *2000 Annual Report* (Ottawa: Ontario Agricultural Services Co-ordinating Committee, February 2000); presented to the Ontario Agricultural Services Co-ordinating Committee.

28. Although production costs are generally on the increase, businesses come up against a market price ceiling, which reduces their profit margins and forces them to make cuts in certain expenditure items.

it develops a new generation of entrepreneurs for the industry and creates a reliable pool of varied skills. But above all, the industry's leaders will have to meet rapidly changing national and international demands, demands arising from changes in demography and consumer habits, from growing concerns about health (the nutritional quality of foods) and security (safety and traceability of foods), and from an insistence on foods that are produced under environmentally friendly conditions. To satisfy these demands, those in the agri-food sector must not only understand these new dynamics, but they must also modify and orient their production to take advantage of these trends. We will now examine these trends in more detail.

■ Main Industry Trends: Eating Habits

On the demand side, the agri-food sector must take into account the change in consumer habits by giving greater priority to products that are more sophisticated but which at the same time retain a natural character and have a continually decreasing market life cycle. Today the average life cycle for these products is two years or at best five years.²⁹ New products are constantly coming onto the market with everything that this entails in terms of research and development, marketing, and advertising. Thus, meeting consumer expectations while improving product adaptability and costs must become the main goal of businesses.

Demographics and Disposable Income

It is well known that the two driving forces behind consumer spending on food are population growth and the increase in disposable income. In Canada, the domestic market is affected by the following factors related to demographics and consumption:³⁰

- ▶ Modest growth in the population (1.5 percent per annum)
- ▶ "Greying" of the population
- ▶ More sophisticated, better-educated consumers who have been exposed to cuisines from other cultures
- ▶ Increased consumer consciousness of food safety and health and the desire for environmentally friendly products

29. "Agroalimentaire : une industrie en transformation," *Guide de l'emploi* (Quebec, April 2003); <http://ge.monemploi.com>.

30. See Agriculture and Agri-Food Canada, *Towards the Next Century: Market Opportunities and Challenges*; http://www.agr.gc.ca/food/industryinfo/processing/sector/opportun_e.html.

- ▶ Greater demand for convenience (double-income families now account for more than 60 percent of households, and they prefer to spend more of their limited time on leisure activities)

These trends will lead to the following opportunities for the Canadian food-and-beverage-processing sector:

- ▶ Healthy foods that contain less fat and are better suited to an aging population for which personal health will become increasingly important
- ▶ Foods that are safe and that have been produced under environmentally friendly conditions and with minimal artificial additives
- ▶ Foods perceived to be of high quality that contain high-quality agricultural inputs
- ▶ Convenience foods that either supplement or replace traditional food preparation, i.e., ready-to-use prepared foods and take-out or home-delivery meals
- ▶ Foods that incorporate sensory appeal such as sauces or flavour enhancers
- ▶ Ethnic cuisines, which appeal to both new-immigrant groups and the increasingly diversified tastes of the indigenous population
- ▶ Foods that are fresh (or perceived to be fresh) and are made using processes that preserve natural flavours

Based on these trends, the prospects for cereal products, lean meats, low-fat dairy products, and processed products that contain more “natural” ingredients, particularly fruits and vegetables, seem particularly promising.³¹ In the United States, for example, during the 1990s there was an explosion of new “nutritional” products on the market — products that it was claimed were healthy — but this stabilized somewhat by the end of the decade (see table 2).

31. According to Agriculture and Agri-Food Canada, *The Canadian Food and Beverage Processing Sector – Adapting to a Global Market*; http://www.agr.gc.ca/food/industryinfo/processing/sector/global_e.html.

Table 2
Introduction of So-Called Nutritional Products,
United States, 1994–2000

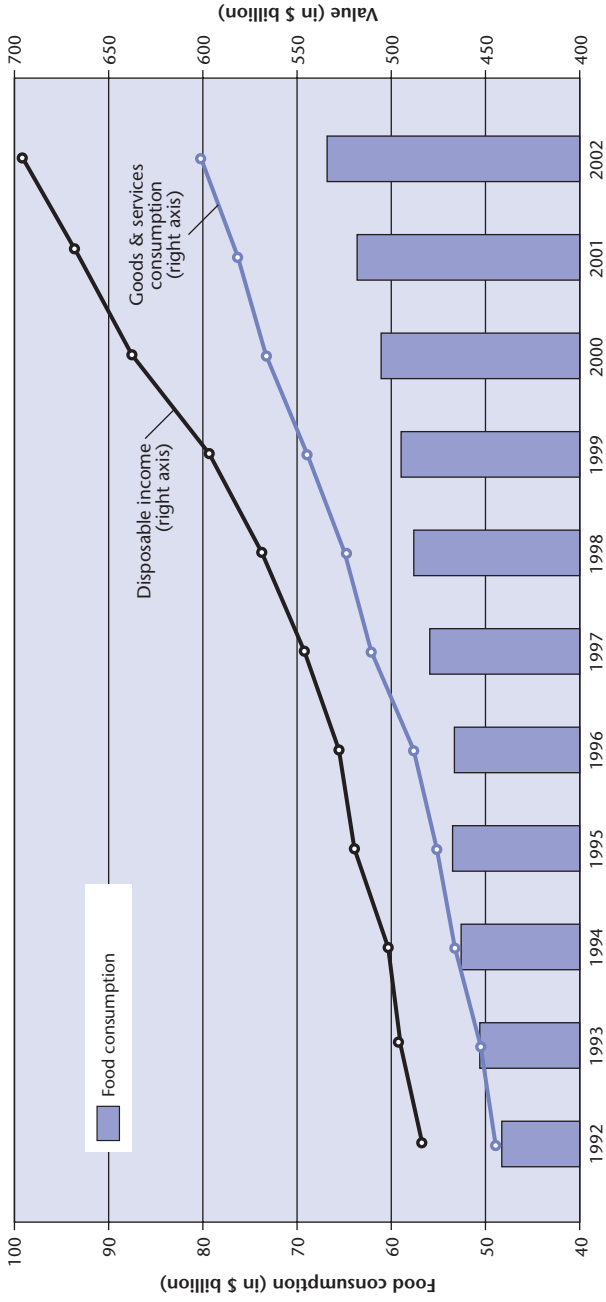
Category of Products	1994	1996	1998	2000	Annual Average 1994–2000
Reduced/low fat	1,439	2,076	1,180	1,057	1,365
Reduced/low calorie, reduced/low sugar, low/no cholesterol	1,248	1,372	744	511	1,024
All natural	575	645	743	1,130	658
Organic	446	645	842	844	657
No additives or preservatives	252	143	149	269	210
Added/high calcium	23	35	45	158	61
Added/high fibre	26	12	43	81	43

Source: Economic Research Service (ERS), United States Department of Agriculture (USDA), *New Product News* (U.S. Food Marketing System, 2002), tables 1–6, AER no. 811.

Population and income, the usual determinants of demand, go some way in predicting consumer trends. For example, in Canada the evolution of food consumption very closely follows that of disposable income. During periods of economic growth, food consumption does not necessarily follow the curve of disposable income; rather it is the consumption of other goods and services that gain most from such growth. This is based on an economic law formulated during the Great Depression of the 1930s by the British economist J. M. Keynes, who maintained that individuals are disposed to increase their consumption as their income increases, but that the average propensity to consume (share of income spent on consumption) decreases as standard of living increases.³² As figure 2 demonstrates, this law seems to apply even more to food products.

32. John Maynard Keynes, *The General Theory of Employment, Interest, and Money* (New York: Harcourt Brace, 1936).

Figure 2
Trends in Disposable Income, Total Consumption of Goods and Services and Food Consumption,
Canada, 1992–2002



Source: Statistics Canada, Agriculture Division, *Food Statistics 2002*, vol. 2, no. 1 (2003), cat. no. 21-020-XIE.

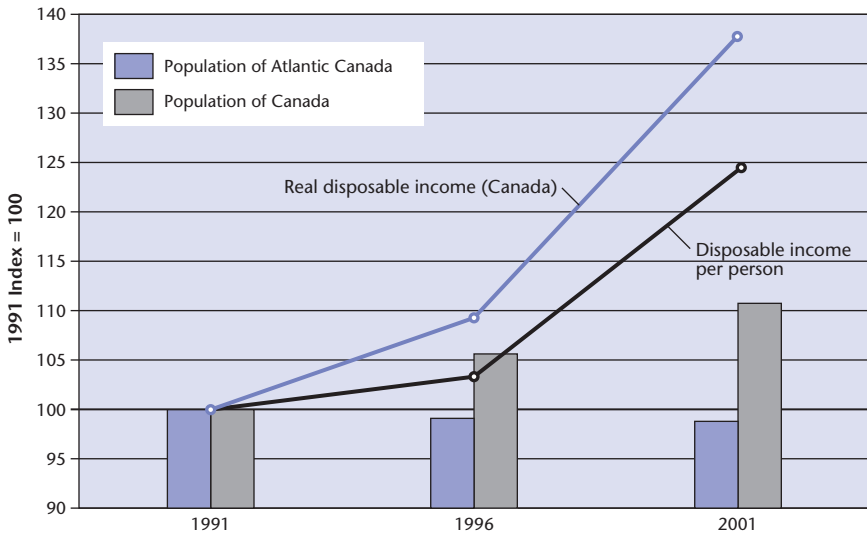
Based on recent projections, there is no reason to believe that there will be substantial increases in food consumption in industrialized countries that have reached their demographic maturity. It is predicted that food-product consumption in industrialized countries such as Canada will grow at an annual rate of 1 to 1.5 percent in the next few years. Businesses serving these markets will undoubtedly concentrate on secondary processing and value added in a context characterized by heightened price competition and the need to launch innovative products.

In the United States, income growth seems to have stabilized during the 1990s so that food demand is now maintained only by population growth. On average, Americans spend approximately 10 percent of their disposable income on food, a level which has remained unchanged for several years. The proportion for Canadians is similar, 9 to 10 percent, which is considered low given the corresponding proportions in several other countries: 13 percent in France, 14 percent in Australia, 15 percent in Germany, and 33 percent in Mexico.³³

This does not mean, however, that the level of food consumption in Canada is stagnant. On the contrary, both the volume and nature (type of foods) of food consumption are constantly changing. New immigration trends (increasing representation of ethnic groups), changes in family size and structure, and population aging are all factors that influence the needs, desires, and buying habits of consumers. Nor is relative demographic stability synonymous with a stagnation in consumption. In fact, it corresponds to a steady growth of consumption in the country as a whole, which is directly related to the growth in real disposable income. From 1991 to 2001, income increased by 37.8 percent (24.5 percent per capita), while the Canadian population grew by slightly less than 11 percent. The Atlantic region is clearly behind in this regard due to its low demographic dynamism (see figure 3).

33. See Canadian Federation of Agriculture, *A Roadmap for Agriculture* (Ottawa: Canadian Federation of Agriculture, 2001).

Figure 3
Demographic and Income Growth,
Canada and Atlantic Canada, 1991, 1996, and 2001



Sources: Statistics Canada, Population Estimates, July 1; Statistics Canada, cat. no. 21-020.

The Evolution of Diet and Consumer Habits

As income increases, consumers tend to diversify their menu, eating more meat, fish, and fresh fruits and vegetables. They are also more inclined to purchase luxury commodities or to eat away from home. Undoubtedly, the decrease in household size, an urban lifestyle, and the greater participation of women in the labour market have largely contributed to the increase in away-from-home food spending, a trend that has benefited the food service industry. In the United States, according to data from the Department of Agriculture (USDA), away-from-home food spending, which was \$36 billion in 1970, soared to \$415 billion in 2002, and went from 33 to 46 percent of total food spending during this period.³⁴ Thus, a large share of the retail distribution market has eroded, which explains, among other things, the phenomenon of concentration in this sector. The trend towards away-from-home food spending is less spectacular in Canada, where it has stagnated in recent years at approximately 35 percent of total food spending.

34. "Away-From-Home Food Spending Has Soared," USDA/Economic Research Service (ERS); <http://www.ers.usda.gov/briefing/cpi/foodandexpenditures/data/table2.htm>.

As regards changing food habits, analyses conducted by federal bodies and consultancy firms reveal a number of interesting trends — for example, that Canadians consume more and more cereal products, low-fat milk instead of homogenized milk, and poultry instead of red meat. The level of food energy consumed per Canadian, which remained relatively stable until the early 1990s, jumped by 17 percent between 1991 and 2001. Rising consumption of oils and fats (41 percent from 1991 to 2001) followed by escalating wheat-flour consumption were the major factors in the substantial increase in energy intake. Much of the growth in carbohydrates in the diet can be attributed to Canadians eating more pasta, speciality breads, and cereal-based snacks. The high consumption of oils is due in part to the increased use of oils by households and fast-food restaurants as well as their use in the preparation of salad dressings, fried foods, and other food products. The level of fat contributed by meats, especially beef, and fluid milk has decreased considerably. As for milk products, the loss of energy resulting from the decline in homogenized milk consumption has been more than offset by the increasing consumption of cheese and other high-fat derivative products.³⁵

In short, the diet of Canadians includes more calories, fat, and protein. There has also been an increase in the consumption of high-calcium foods, including milk and other dairy products, which account for 70 percent of our calcium intake. Most of the other vitamins and minerals are also more prevalent in the diet of Canadians. The higher consumption of processed and enriched foods, such as orange juice and breakfast cereals, has contributed to this increase.

As for beverages, there has been an increase in alcohol consumption, particularly wine, which is becoming more popular. However, the growth in the consumption of soft drinks is much greater. The appearance of fast-food restaurants, combined with the fact that Canadians increasingly eat away from home, has undoubtedly contributed to the growth in the demand for soft drinks. Figures 4 and 5 and table 3 provide details on the evolution of consumption of the main food product groups, the highlights of which are as follows:

35. Based on among others: <http://www.statcan.gc.ca/français/ads/23F0001XCB/highlight.htm>.

Dairy products:

- ▶ Overall, the consumption of dairy products is decreasing. Canadians are drinking 27 litres less per person of higher-fat milk than they did thirty years ago. However, lower-fat varieties continue to capture higher market shares, so much so that total milk consumption (all categories combined) has only decreased by approximately 12 percent.
- ▶ Fat content does not seem to have discouraged consumers from buying other dairy products — for example, cheese, whose consumption per person has tripled since 1965, and cream, the demand for which is in line with the increasing consumption of coffee, especially from food-service establishments.
- ▶ Cheese remains very popular with Canadians. Cheese consumption is stimulated by, among other things, the strong demand for prepared foods and convenient shredded cheeses including blended products used in Mexican and Italian dishes (especially pizza). Consumption of ice cream is holding steady, while yogurt is broadening its appeal due to the constant development of new products and packaging as well as tastier and more innovative products.

Cereal products and eggs:

- ▶ Average consumption per person increased by 15.5 percent from 1965 to 2000. Consumption of pasta, bakery products, and cereal-based snacks is growing. Wheat flour accounted for 82 percent of all cereal products consumed.
- ▶ Egg consumption rebounded from the bad publicity of the 1980s partly through public education campaigns outlining the nutritional benefits of eggs but probably more because of the increased use of eggs by the food services and the growing popularity of value-added products.

Meats:

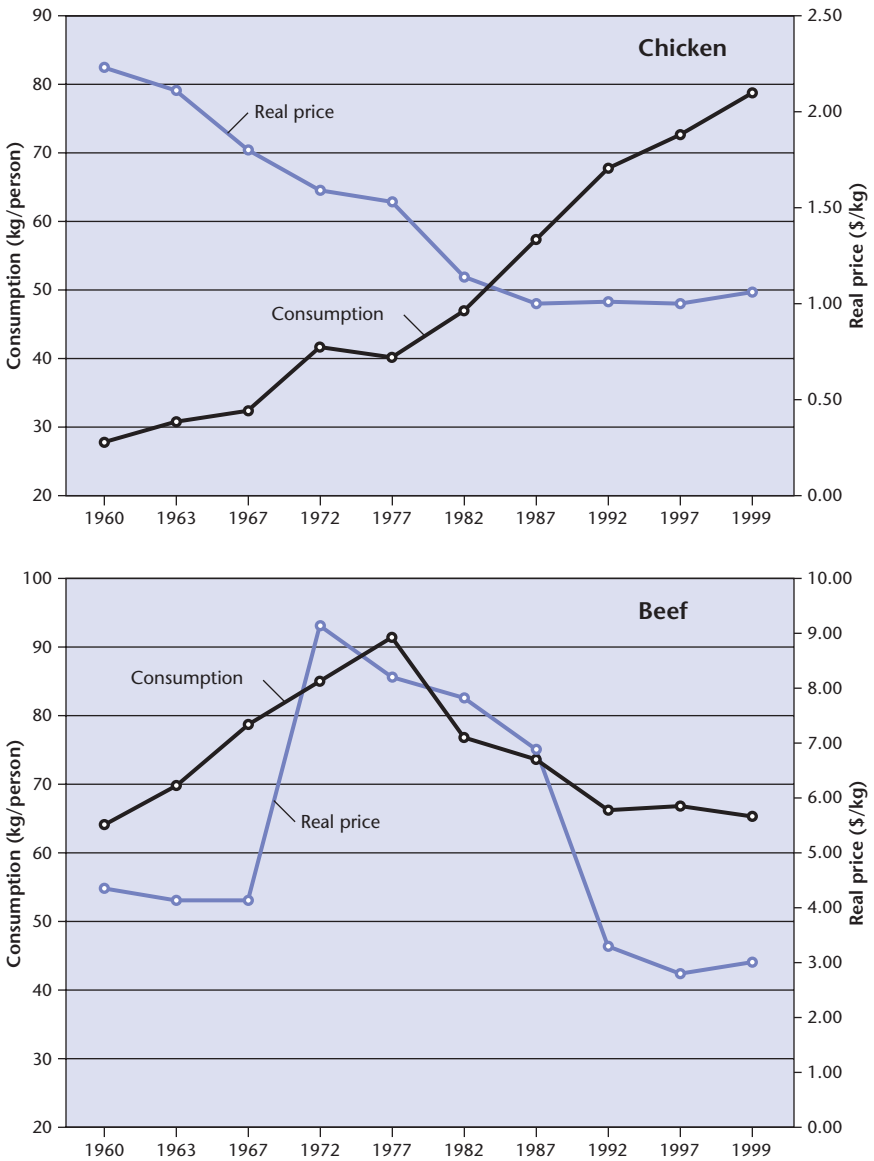
- ▶ After increasing until the mid-1970s, red meat consumption registered a net decline, from 78 to 61 kg per person between 1975 and 2000, a nearly 22 percent drop. This decrease is due mainly to declining beef and pork consumption. Fortunately for producers, the strong demand for pork in the United States and Japan offset the weak domestic market for these products.
- ▶ Poultry still appears to be popular, its consumption per person almost doubling since the early 1970s. This continuous increase, to the detriment of red meats, can be partly explained by the abundance of easy-to-prepare and ready-to-eat chicken products. Its enormous popularity makes it a very competitively priced mass product, thus further stimulating demand (see figure 4).

Fruits and vegetables:

- ▶ The growth in the amount of vitamins and minerals in the diet is due to the increased consumption of fruits and vegetables. Greater use of fresh-cut products, pre-packaged salads, and other processed products (frozen vegetables) has contributed to the growth in fruit and vegetable consumption. As shown in table 3, fresh fruit consumption per person increased from 56.6 to 63.4 kg (12 percent) between 1980 and 2002, while consumption of fresh vegetables during the same period increased from 127 to 144 kg (13 percent). On the other hand, during the same period consumption per person of processed fruits remained stagnant, while that of processed vegetables increased only slightly (from 16.8 to 18.1 kg), due mainly to the popularity of frozen vegetables.

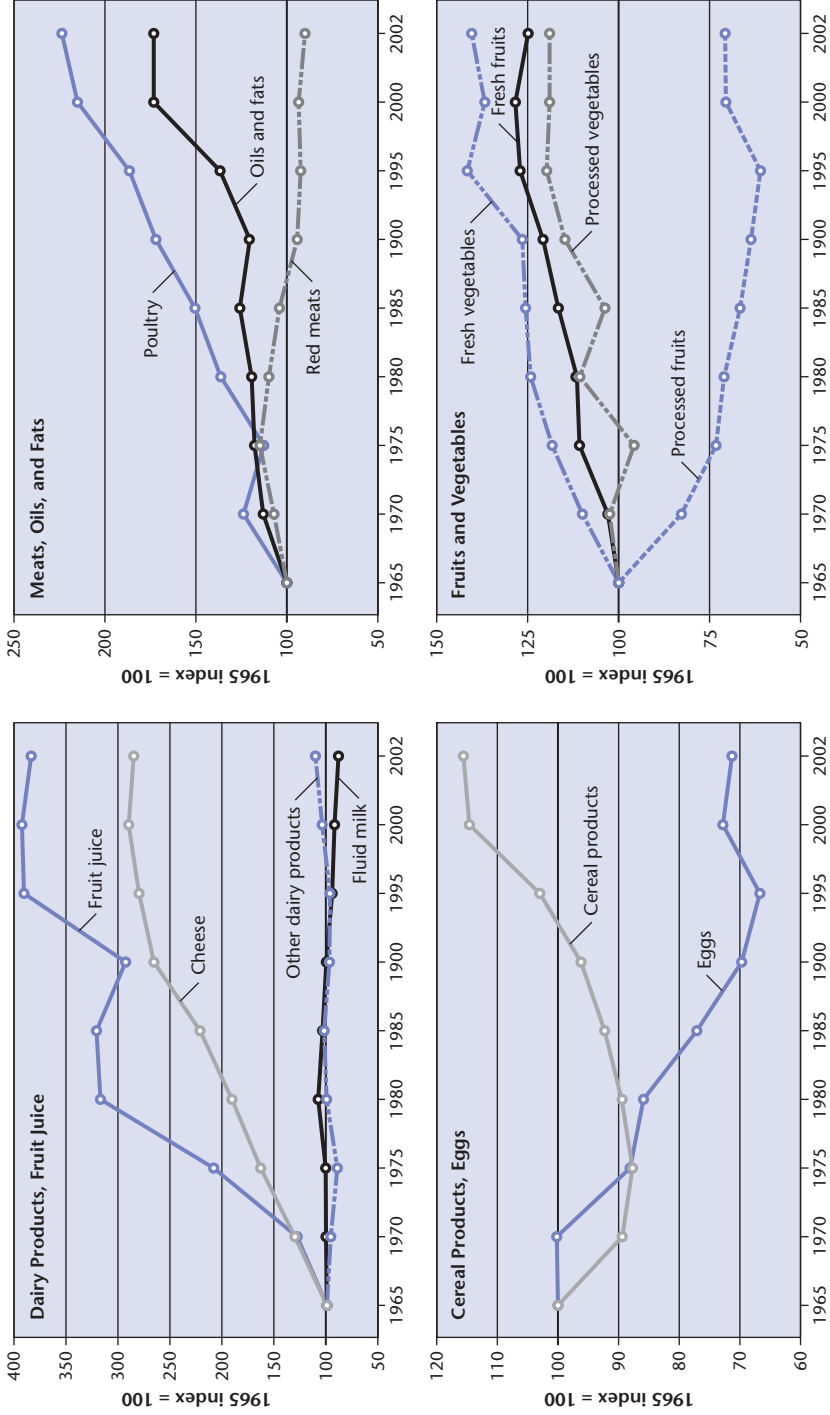
Figure 4

Chicken and Beef Consumption vs. Retail Price, Canada, 1960–99



Sources: Statistics Canada, Agriculture Division, *Food Statistics 2002*, vol. 2, no. 1 (2003), cat. no. 21-020-XIE; Agriculture and Agri-Food Canada, "Comparison Table between Canada and United States: Per Capita Disappearance of Certain Commodities"; http://www.agr.gc.ca/misb/fb/food/consumer/statistics/can_us_e.html.

Figure 5
Food Consumed per Person, by Major Categories, Canada, 1965–2002



Source: Statistics Canada, Agriculture Division, *Food Statistics 2002*, vol. 2, no. 1, 2003, cat. no. 21-020-XIE.

Table 3

Food Consumed per Person, by Major Food Groups, Canada, 1965–2002
(In Retail Weight, Kilograms per Person, Unless Otherwise Indicated)

Year	Dairy Products				Meats			Fruits		Vegetables		Beverages			
	Fluid Milk (litres)	Cheese	Other	Cereal Products	Eggs (dozen)	Oils and Fats	Red (slaught.)	Poultry (evisc.)	Fresh	Proc.	Juice (litres)	Fresh	Proc.	Alcohol. (litres)	Soft Drinks (litres)
1965	94.9	4.1	23.0	77.0	21.6	18.4	68.2	16.4	50.8	11.9	6.7	102.6	15.2	72.1	n.a.
1970	95.7	5.4	22.1	68.9	21.7	20.7	73.0	20.3	52.3	9.8	8.7	112.8	15.6	83.5	n.a.
1975	96.0	6.8	20.7	67.5	19.0	21.6	78.3	18.4	56.3	8.7	14.1	121.2	14.6	99.2	58.4
1980	102.8	7.9	23.0	68.9	18.6	21.9	75.0	22.3	56.6	8.4	21.4	127.4	16.8	98.4	67.0
1985	98.9	9.2	23.6	71.1	16.7	23.1	71.0	24.6	59.2	7.9	21.7	128.8	15.8	96.3	77.9
1990	95.4	11.0	22.4	74.1	15.1	22.1	64.3	28.1	61.3	7.6	19.8	129.7	17.5	88.9	96.4
1995	90.2	11.6	22.3	79.3	14.4	25.1	63.0	30.5	64.5	7.3	26.4	145.2	18.2	81.8	109.5
2000	87.9	12.0	24.0	88.3	15.7	31.8	63.8	35.2	65.2	8.4	26.5	140.2	18.1	83.9	112.8
2002	84.3	11.8	25.5	89.0	15.4	31.8	61.4	36.6	63.4	8.4	25.9	143.9	18.1	83.8	113.2
Consumption Index per Person (base: 1965 = 100)															
1965	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	n.a.
1970	100.9	130.8	96.3	89.4	100.2	113.0	107.1	123.9	102.9	82.7	128.6	109.9	102.4	115.8	n.a.
1975	101.2	163.7	90.0	87.7	88.1	117.8	114.8	112.7	110.7	73.2	208.9	118.2	95.7	137.6	100.0
1980	108.4	191.3	100.3	89.5	85.9	119.4	109.9	136.4	111.4	71.0	317.7	124.1	110.6	136.4	114.7
1985	104.2	222.0	102.7	92.3	77.1	125.9	104.1	150.6	116.5	66.6	321.5	125.5	103.7	133.5	133.4
1990	100.6	266.3	97.6	96.2	69.7	120.4	94.3	172.1	120.7	63.6	293.5	126.4	114.7	123.3	165.0
1995	95.0	280.6	97.1	103.0	66.7	136.8	92.4	186.7	127.0	61.0	391.2	141.5	119.7	113.5	187.5
2000	92.7	290.6	104.6	114.6	72.8	173.3	93.5	215.3	128.3	70.5	393.2	136.7	118.9	116.4	193.1
2002	88.9	285.7	111.1	115.6	71.3	173.3	90.0	223.9	124.8	70.7	384.3	140.3	118.9	116.2	193.8

Source: Statistics Canada, Agriculture Division, *Food Statistics 2002*, vol. 2, no. 1 (2003), cat. no. 21-020-XIE.

What do we know about the eating habits of our main export customer, the United States? Generally speaking, the diets of Canadians and Americans are very similar, such as the replacement of red meats with poultry; the consumption of lower-fat milk instead of homogenized milk; the popularity of specialty foods such as cereal-based preparations, ready-to-cook or ready-to-eat meals (e.g., fresh or frozen pizzas), and bakery-pastry products; and the increased consumption of fresh fruits and vegetables as recommended by public education campaigns and food guides (see table 4). Paradoxically, there has also been a sharp growth in products thought to be less healthy, such as fried foods and soft drinks. These products have benefited greatly from the trends explained earlier — for example, the increase in away-from-home food spending and changes in the labour market (longer hours and variations in shifts), which mean less time to prepare food at home.

Ready-to-eat meals:

▶ Ready-to-eat meals, which are highly popular in the United States, account for a very small market in Canada, insignificant by comparison to the American market potential.³⁶ A study on the subject by Agriculture and Agri-Food Canada found that our lower disposable income does not allow us the luxury of ready-to-eat meals on a regular basis. Women, who are still the cooks in the majority of Canadian households, also prefer to be more involved in the preparation of the foods they serve at home. They regard ready-cooked meals with suspicion and so feel they should add to them to make them more homemade. As well, many families place a priority on eating their evening meals together, and the work of preparing them often falls to women in spite of the competing demands of a job.³⁷

36. According to analysts at the United States Department of Agriculture, ready-to-eat meals account for 4 percent of total retail sales in the United States, a small share of an enormous market (retail food sales total US\$484 billion). This share is constantly growing; large potential markets include Mexico and China, where the market share of ready-to-eat meals is still tiny. See Mark Gehlhar and Anita Regmi, "Shaping the Global Market for High-Value Foods," in *Agricultural Outlook* (Washington, D.C.: USDA, ERS, December 2002).

37. See Michelle Marcotte, Linda Robbins, and Lynn Stewart, *Canadian Consumer Food Buying Trends*, Ottawa, Agriculture and Agri-Food Canada, Food Bureau, 1999.

Pizza:

- ▶ Now in a category of its own, pizza is purchased frozen or ready to eat and is made at home. Pizza is an important factor in the deli-meat and cheese-production industry. However, competition in some markets has resulted in lower-quality pizza and the use of lower-quality cheese. Also, the fat content of pizza is likely to be an issue with a greying population and with fat-conscious teens and Gen Xers.

According to analysts at the Food Bureau of Agriculture and Agri-Food Canada, Canadians are abandoning certain products for others. The table below summarizes the most important of these changes.³⁸

We are eating more:

Rice
 Breakfast cereals
 Pulses and nuts
 Vegetable-based fats
 Chicken
 Fish
 Fruits and vegetables
 (exotic, health +)
 Frozen vegetables
 Cheese
 Yogurt
 Low-fat dairy products
 Soft drinks

We are eating less:

Sugar
 Animal fats (butter, lard)
 Red meats
 Offal
 Eggs
 Canned vegetables
 Skim milk powder
 Cocoa
 Tea

38. Ibid.

Table 4
Comparative Consumption of Food Products,
Canada and United States, 1999
(Average Annual Consumption per Person, in Kilograms)

Food Product	Canada	United States
Cereals	82.86	83.14
Wheat flour	69.42	67.31
Breakfast food	5.46	7.03
Eggs	183.59	254.60
Meat	79.00	104.55
Beef	23.79	31.25
Pork	21.42	24.36
Poultry	33.79	48.94
Fruits	66.88	65.56
Fresh	62.09	57.33
Frozen	1.62	1.27
Canned	3.17	6.96
Juice (litres)	25.26	35.05
Vegetables	117.67	177.90
Fresh	140.84	125.19
Frozen	7.74	9.12
Canned	29.09	43.59
Dairy products	106.17	113.97
Standard milk	14.08	30.24
Light and 2% milk	68.31	52.73
Other milk	5.08	6.27
Cream (litres)	6.34	4.14
Cheese	11.84	13.53
Yogurt (litres)	4.04	2.14
Ice cream	5.85	7.62
Beverages (litres)	283.01	321.38
Soft drinks	116.65	192.30
Coffee	98.97	97.28
Tea	67.39	31.80
Fats	66.62	57.97
Butter and margarine	8.09	5.85
Salad oil	13.37	13.34
Shortening and shortening oil	11.85	9.80
Oils and fats	33.31	28.98
Fish	9.98	6.89

Source: Agriculture and Agri-Food Canada, "Comparison Table between Canada and United States: Per Capita Disappearance of Certain Commodities"; http://www.agr.gc.ca/misb/fb/food/consumer/statistics/can_us_e.html.

Although demand dictates supply, the reverse can also be true. Thus, the competition between processors and suppliers of food products to grab a share of the market has led first to an explosion of differentiated products (new labels, new ingredients, new tastes, new packaging, etc.). Today, US consumers have about forty thousand food products to choose from in the typical American supermarket.³⁹ Every year, hundreds, if not thousands of new products appear on the shelves of supermarkets and specialty stores. In the area of natural or nutritional products, suppliers have targeted specific market niches, in particular the health-conscious greying population. The fruit departments of supermarkets and specialty-food stores offer a vast selection of fruits to satisfy or stimulate consumer demand. Compared to beef and pork, poultry has benefited from the increased demand for healthier and lighter meats. Moreover, innovation in the creation of new products has led to the appearance of a wide range of value-added products such as regular or smoked chicken sausages, which compete directly with products made from red meat.

■ Main Industry Trends: Business Concentration

One of the most tangible aspects of the trends presented earlier is undoubtedly the concentration of units of production, distribution, and marketing. The concept of the international mega-business is continuing to emerge as a dominant economic organization. This construction of large, powerful businesses is also reflected in the mergers and acquisitions that occur in all industries, including agri-food. In 1999 at least five thousand mergers and acquisitions, representing nearly \$800 billion,⁴⁰ took place worldwide. There is no doubt that these large-scale operations were facilitated by a rapidly expanding financial market. Since then, this trend has slowed down slightly as a result of the bursting of the stock market bubble, but the factors underlying the trend towards the consolidation and re-engineering of businesses remain.

The phenomenon of business integration, though not new, is the subject of many surveys and studies. In particular, there are a number of documents produced by the United States Department of Agriculture as well as studies by the Western Agri-Food Institute in Winnipeg, which has focused on the consequences of industrial and

39. USDA, ERS, *U.S. Food Marketing System, 2002*, AEC Report no. 811 (June 2002).

40. MAPAQ, Direction de la recherche économique et scientifique, "Agroalimentaire : fusions et acquisitions, des raisons et des impacts," *Bioclips* + 4, no. 4 (October 2001).

business concentration for agricultural communities.⁴¹ We will refer to these sources in the following paragraphs.

The trend towards consolidation is particularly strong in the United States, where, according to the USDA Economic Research Service, industry share of the value of shipments in large slaughter plants (with at least four hundred employees) increased from 37 percent in 1977 to 72 percent in 1992 for cattle, 67 to 86 percent for hogs, and 45 to 88 percent for chickens.⁴² This trend is even stronger in the distribution sector: since 1996, almost thirty-five hundred supermarkets have been purchased by mega-businesses, representing annual grocery store sales of more than US\$67 billion; the share of the eight largest retailers in grocery store sales increased from 16 to 29 percent in the space of a few years (from 1992 to 1998).⁴³

In Canada, 70 percent of beef packing is controlled by two companies, and only three companies control more than 70 percent of fertilizer sales.⁴⁴ This concentration is more pronounced in the United States, where four beef-slaughtering firms, with 75 percent of the market, dominate the sector.⁴⁵ The same situation exists in the distribution sector. In Canada, the five main food distribution firms have 52 percent of the market (82 percent in Quebec). In some European countries (Norway and Sweden), the concentration is even higher.⁴⁶ The food market is still more consolidated in Canada than in the United States, for example, where the five largest food companies have only 25 percent of the market.⁴⁷

More than previously, the search for economies of scale, or efforts to reduce production costs, only partly explains the phenomenon of mergers. Through such operations, large firms under pressure to reach growth objectives can quickly capture market shares. Increased market share is of the utmost importance to wholesaler-retailers as well as to crop and animal producers, processors, and manufacturers, and not

41. Western Agri-Food Institute, *A New Agriculture: Making the Connection*, a report on rural adaptation to structural change (Winnipeg: Western Agri-Food Institute, March 2001).

42. James M. MacDonald *et al.*, *Consolidation in U.S. Meatpacking*, Agricultural Economics Report, no. 785 (Washington, D.C.: USDA, March 1999), tabl. 3–4: 9.

43. USDA, ERS, "Consolidation in Food Retailing: Prospects for Consumers and Grocery Suppliers," *Agricultural Outlook* (August 2000).

44. Western Agri-Food Institute, *A New Agriculture*.

45. William Heffernan, *Consolidation in the Food and Agriculture System* (Denver, CO: National Farmers Union, 1999), 3–4.

46. "Nouvelle offensive de Wal-Mart dans l'alimentation," *Les Affaires* (15 March 2003).

47. MAPAQ, "Agroalimentaire : fusions et acquisitions."

only as a means of achieving economies of scale. According to the Canadian Agri-food Marketing Council, it also has a positive impact on profitability, which attracts capital investment and encourages the hiring of skilled workers.⁴⁸ Increased market share makes it possible for businesses to acquire strategic assets that take a long time to develop internally: it allows them to obtain state-of-the-art equipment and machinery, thus helping to strengthen their production capacity and competitiveness.

Finally, increased market share gives firms a greater competitive advantage, allowing them to respond more directly to the expectations and specific needs of their clients. It is not surprising, therefore, that large companies first concentrate their efforts on product lines that have a substantial market share, that is, where they can exercise a degree of influence on the market. At the national and even regional levels, increased market share enhances the visibility and credibility of the suppliers, the region being recognized for the standards or characteristics associated with certain products. It is in this spirit that the firms in this very region are striving to promote groupings of brands or products under the same banner — for example, Taste of Nova Scotia, an alliance of producers and processors committed to upholding quality assurance standards and thus enhancing their visibility.

In what way and in what context is this vertical integration structured? Recent work on this question by researchers at Quebec's Department of Agriculture, Fisheries and Food (ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec or MAPAQ) has yielded some interesting results. Underlying this trend is the processing-distribution linkage and at least the partial integration of other agri-food fields. "Over time, food product distributors have become involved, directly or indirectly, in the processing or conditioning of foods and beverages either to guarantee and regulate the volume of their supplies or to stabilize their turnover. At the same time, and more or less for the same reasons, processing firms have taken the reverse route and become involved in distribution networks. In fact, these different movements have anchored firms in relationships of vertical integration/co-ordination"⁴⁹ (translation).

48. Canadian Agri-Food Marketing Council, *Trade Vision* (June 2003); on-line comments; <http://www.camc-ccca.org/trade-e.htm>.

49. See MAPAQ, "Intégration et coordination verticales dans la distribution alimentaire : les expériences d'intervenants majeurs," *Bioclips* + 5, no. 4 (December 2002); <http://www.agr.gouv.qc.ca/ae/bioclips+/vol5no4/vol5no4.htm>.

Grouping activities within systems, building strategic alliances, expanding or merging businesses, adopting common marketing strategies, and segmenting the market all point to an environment of imperfect competition in which the agri-food economy will continue to evolve. Researchers at Université Laval have studied the factors underlying this phenomenon. They concluded that increased concentration in several processing industries has created a new power relationship between processors and producers that has forced the latter to mobilize. Hence the creation of many marketing bureaus. They add, "With the conclusion of the most recent GATT negotiations, the agri-food sector is slowly but surely globalizing. These major changes in the economic environment can be expected to affect the evolution of agri-food systems, whether in Quebec, Canada, or abroad"⁵⁰ (translation).

At the end of the day, each segment of the food sector will be made up of only a few large businesses joined by a multitude of small businesses acting as subcontractors and specializing in particular market niches or serving essentially local markets. Thus in Canada, retail food distribution is dominated by the following giants:

Loblaws:

▶ With a turnover of \$20.1 billion in 2000 and 30 percent of the Canadian market, Loblaws has more than one thousand stores across the country. In 1998 it acquired Provigo. Its main shareholder is the George Weston Group, which also owns businesses in food (cookie manufacturers, bakeries) and dairy product (Neilson Dairy) processing.

Sobeys:

▶ With a turnover of approximately \$8 billion, Sobeys is a Maritime business that accounts for 12 percent of food product sales in Canada. Sobeys Inc. is a wholly owned subsidiary of the Empire Company Limited financial holding group, in which the Sobeys family of Nova Scotia has majority control. This company is the largest food distributor in the Maritimes and became the second-largest distributor in Canada when it acquired the Oshawa Group in 1998. The linkages between Sobeys and the processing sector result from the very strong ties between the Sobeys family and the

50. *Cahiers du CRÉA* (Centre de recherche en économie agroalimentaire), Faculty of Agriculture and Science, Laval University; <http://www.crea.ulaval.ca/divers/6-6-theme2-2.html>.

other large family empire in Nova Scotia, the Jodreys. Until 1977, the two families had majority control of National Sea Products, Nova Scotia's largest employer and the largest seafood product company in Canada. The only manufacturing business created and wholly owned by Sobeys Inc. is Big Beverages Inc., a soft drink manufacturer established in Stellarton, Nova Scotia. Thus, the involvement of Sobeys Inc. in processing is essentially an association with regional interests.

Metro:

- ▶ With 7 percent of the Canadian market, Metro is concentrated mainly in Quebec. Originally a butcher-grocers' buying group, it became Les marchés Métro-Lasalle in 1970 and set out to develop private-brand products. In 1995, after two years of research, tests, and consumer surveys, Metro-Richelieu launched fifteen frozen-food products (appetizers, first courses, fruit wafers, bagels, and French bread) under its new, prestigious private brand, Sélection Mérite.

Safeway Canada:

- ▶ With 7 percent of the Canadian market, this company is a subsidiary of Safeway Inc. (California), which in Canada owns thirteen plants and markets a wide range of dairy products, particularly through its dairy plants in Winnipeg and Edmonton. From Winnipeg, Safeway built a network of 130 stores, including 69 that were bought from the Piggly Wiggly chain.

Co-op Atlantic:

- ▶ Co-op Atlantic is a group of cooperative enterprises (retail consumer cooperatives and agricultural cooperatives) and has 135 retail stores in the four Atlantic provinces and Magdalen Islands. The second-largest regional wholesaler in Canada, Co-op Atlantic employs six hundred people and has a consolidated sales figure of over \$500 million.⁵¹

Though these are dominant players on the Canadian or Atlantic scene, their stature is diminished when compared with American giants such as Wal-Mart and Costco, which are gradually invading the Canadian market with their supercentres, their shelves stocked full

51. <http://www.co-oponline.com>.

of food products at unbeatable prices. Wal-Mart, with its one thousand superstores, has an annual turnover of \$247 billion; employs 1,140,000 people in some four thousand stores located in ten countries, including Canada (which has 122 stores), Mexico, and even China; and provides fierce competition to grocers who operate more specialized businesses.

The food distribution market is obviously much smaller and more dispersed in Atlantic Canada. Food stores serve an average of 615 people in the Maritimes, compared with 1,150 in Canada as a whole. Moreover, the Maritime average increased by only 2.2 percent from 1992 to 1997, compared with 22 percent for the entire country. This reflects both the region's low population growth and a less intense process of concentration.⁵²

The Effect of Size: Challenges, Advantages, and Consequences for SMBs in the Atlantic Provinces

The search for a critical size also drives sector-based businesses in the region (primary agriculture and processing-manufacturing). Agriculture continues to be consolidated as small operations are sacrificed to larger producers which manage to increase their average size and be more competitive while supplying a specialized output. This is true, for example, in the potato industry, where two large businesses, McCain and Cavendish Farms (Irving), have a quasi monopoly and control most of production-processing. In the dairy sector, several regional groups have existed for some time, including Amalgamated Dairies (PEI), Scotsburn Dairy Group (NS), Central Dairies (St. John's), Farmer's Co-Operative Dairy (NS), and Northumberland Cooperative Dairy (NB). Nevertheless, the sector underwent intense consolidation when Saputo, a Montreal company, bought out Baxter Foods in southern New Brunswick. The trend towards consolidation can also be seen in the meat sector (the merger of Hub Meat Packers, Moncton, with Larsen Packers, Berwick, NS, the latter controlled by the national company Maple Leaf Foods); the poultry sector (Fermes Nadeau, NB, controlled by Maple Lodge); the pork sector (the emergence of large operations such as Metz Farm, NB, which has a target output of thirty thousand head); and the emerging small fruits industry, in particular wild blueberries (Oxford Frozen Foods, NS, acquired the assets of Mega Blue, NB, thus enlarging its supply base).

52. "La distribution alimentaire au Québec : évolution récente et perspective," *Bioclips* + 2, no. 2 (March 1999); figures drawn from the Canadian Grocer, *National Market Survey* (1998).

There is nothing particularly surprising about this trend towards consolidation. It is merely the outcome of an international phenomenon, although one which may well have important effects on the structure, operating modes, and especially the competitiveness of Atlantic Canada's businesses. The trend towards consolidation does not necessarily compromise the survival of certain groups that have existed for a long time in the region and whose profitability depends on strong local or regional foundations (cooperatives, family businesses serving a local market), no more than they are threatened by businesses that have recently become involved in growth areas such as the bakery-pastry sector. This trend towards integration can be seen in the various segments of the agri-food industry at the regional, national, and international levels. For the most part, it is led by distributors and manufacturers for the following reasons:⁵³

- ▶ **Visibility:** When a business puts a flagship product on the market to establish its reputation and develop customer loyalty
- ▶ **Supply:** To obtain high-quality supplies at a good price when needed and in the quantity required
- ▶ **Market share:** To increase growth potential (e.g., in a subsector in which sales are low or stagnant)
- ▶ **Profit margins:** Vertical integration as a way to diversify profit sources and thus increase the profit margins of distributors and processors

In these conditions, it is not surprising that the most profitable sectors in Atlantic Canada are generally those in which there has already been a degree of vertical and horizontal integration or in which strategic alliances or joint ventures have been created. In this respect, the region is merely following a well-established national and international trend to which producers-processors must respond.

The offensive staged by certain large American retailers (Wal-Mart, Costco) against the Canadian market is pushing retail food leaders (Loblaws, Métro, Provigo, Sobeys) to adapt to the new competitive realities. The large Canadian food distribution companies must follow the path of warehouse stores by offering a combination of food and nonfood products. Today, supercentres are fashionable, that is, businesses with 100,000 to 150,000 square feet of surface area, a third of

53. MAPAQ, "Intégration et coordination verticales, 1-2"; <http://www.agri.gouv.gc.ca/ae/bioclips+/vol5no4/vol5no4.pdf>.

which is devoted to vast food displays (fruits, vegetables, meats, frozen foods, baked goods, etc.).⁵⁴

In addition to the potential environmental risks of such industrial concentrations (e.g., waste management), their consequences should also be considered both for markets (control of primary-product prices and consumer-product sale prices) and for the future of rural agricultural communities. Thus, how will rural agriculture as well as food processing and distribution businesses in outlying regions adapt to these changes?

It seems obvious that the ultimate aim of the consolidation trend, regardless of the sector, is to reduce the management and operating costs of businesses. Reducing production or distribution costs can help businesses to improve their productivity while increasing their market share. It should be noted that costs can also be reduced through greater negotiating power when purchasing inputs. In addition, reducing costs can increase the capacity of businesses to adjust (speed and flexibility) to the new market realities. On the latter point, experience shows that in general, SMBs know how to take advantage of their small size to quickly adapt their production management and organization to changing demand.

Evidently, many agri-food operations or businesses will find it difficult to follow this consolidation trend and will have to either join a dominant company or close down. Others will try to develop their own market niches or will opt to form strategic alliances with partners both upstream and downstream of their field of activity. In the end, however, most will find a way to continue to operate, but to do so they will have to make major changes.

In the past, the real challenge facing all producers was to keep production costs as low as possible in order to obtain acceptable profit margins. Periods of high inflation have been particularly damaging in this respect, because input costs tend to climb more rapidly than farm-product prices.⁵⁵ Many people have blamed mega-businesses, which impose their laws on the entire chain — from the farm to the retailer. However, the conclusions drawn by USDA economists on

54. Jolicoeur, "Nouvelle offensive de Wal-Mart dans l'alimentation."

55. From 1986 to 1996, farm input prices in Canada rose 25.2 percent while farm product prices increased by only 16.7 percent. The consumer price index (CPI) increased by 28 percent during this ten-year span. See Canadian Federation of Agriculture, "The Canadian Farm," in *Agriculture in Canada*; http://www.cfa-fca.ca/english/agriculture_in_canada/farm_structure_and_finance.html.

this question have been less categorical. They maintain that when four-firm concentration ratios exceed 80 percent, it is naturally easier for mega-businesses to control certain aspects of the market, both upstream (raw material and supplies) and downstream (wholesale and retail prices).⁵⁶

The challenge of producing at lower costs remains, but the new environment is obviously more complex. Regardless of their size, businesses will have to work more as a network. According to the director of the Center for the Study of Rural America: "As supply chains become a more dominant structure in U.S. agriculture, farmers face a very simple test: build new relationships or be left out of the game. Those who do stand to reap new fields of opportunity in the new century."⁵⁷ In short, it is inevitable that the relationships between businesses, suppliers, and their customers will have to be redefined. We will now examine this question in the context of Atlantic Canada.

The evidence suggests that the region's agri-food producers are generally well equipped to face the challenge of production costs. This is reflected in many of the findings presented in a later section of this report which analyzes productivity in the industry. Access to new technologies and the application of modern management methods continually give rise to productivity gains. However, the new environment of consolidation and the integration of supply and distribution chains seems to be different from the mass market or the commodity market, resembling instead a more segmented market that meets the stricter needs and demands of consumers. The primary producers and food processors must conform to these new trends and either try to become integrated into the new chains or network with them.

The trend toward consolidation and concentration, particularly in the field of distribution, will continue to have an impact on the freedom of regional producers to manoeuvre. As they have for the last fifteen years or so, these producers will have to submit to harsher economic conditions and demands, challenges that will be more difficult to meet given the greater purchasing power of distributors. SMBs and small companies operating in mass segments will find it difficult to compete with large companies that offer the same products. Hence the need to differentiate themselves through a more diversified, more

56. Michael Ollinger, James MacDonald and Milton Madison, "Poultry Plants Lowering Production Costs and Increasing Variety," *Food Review* 23, no. 2 (May–August 2000).

57. Mark Drabentstott, "Consolidation in U.S. Agriculture: The New Rural Landscape and Public Policy," *Federal Reserve Bank of Kansas City, Economic Review* (1st quarter 1999).

original output, even by their brands or by other characteristics of basic products (e.g., organic products, all-natural foods, local products, etc.).

Production Contracts

In order to soften the cycles that characterize food production and ensure both regular supplies and stable prices, there is an increasing trend to adopt *production contracts* or *marketing agreements*. USDA estimated that about 10 percent of all farm and animal output was purchased through production contracts, and another 8 percent came from farms owned by food-processing firms (vertical integration). Another 27 percent of farm output was purchased through marketing contracts.⁵⁸ This breakdown is equivalent to that noted in Atlantic Canada.

Such agreements linking the suppliers of primary or processed products to businesses further downstream (processors, manufacturers, distributors, and wholesalers) provide certain advantages to crop and animal producers. For example, they can gain access to additional capital, acquire state-of-the-art production technologies (genetic), and, in particular, benefit from a larger-scale market launching. On the other hand, these agreements may mean a loss of autonomy for agricultural businesses, which are no longer the real owners of their crops and cattle since they agree to produce commodities or animals according to the terms set out by the other party, which can be a primary-processing, seed, or manufacturing business. This practice is also common in Canada, where the risk to small operators is greater due to legislation that is less restrictive than in the United States.⁵⁹

■ Main Industry Trends: The Environment and Food Safety

The public is becoming increasingly aware of environmental issues and less tolerant of production processes with a potential to harm the environment. These fears exist not only in highly populated areas but also in rural and semirural regions which are trying to preserve the quality of their environment. Thus, in some parts of Canada the

58. Production contracts are entered into even before production begins, while sales, or marketing, contracts are agreements to market a supplier's output after production has begun. Michael Harris *et al.*, *The U.S. Food Marketing System, 2002* (Washington, D.C.: USDA, ERS, June 2002), 4.

59. Adrian Ewins, "Production Contracts Can Be Minefields," *The Western Producer* (Saskatoon, 16 January 2003).

expansion of certain types of animal production (hog farms) has been stopped, while in others their development is being blocked by public opposition.⁶⁰ Intensive farming can also adversely affect the environment, particularly in regions where the widespread use of pesticides and chemical fertilizers threatens the health of rivers and estuaries and sometimes contaminates free groundwater.⁶¹

That said, the food inspection system in Canada is recognized internationally as one of the best in the world. The programs and sampling and inspection methods of the Canadian Food Inspection Agency (CFIA) are continually being studied and improved so as to take into account the most recent scientific data, new inspection techniques, new processes and products, and new approaches to food safety (including the HACCP, or Hazard Analysis Critical Control Point System) as well as to ensure that they are consistent with the practices of other organizations and conform to international standards. Nevertheless, all it takes is one isolated incident (e.g., the discovery in June 2003 of a case of bovine spongiform encephalopathy, or BSE, on an Alberta farm) to shake the whole protection system and undermine public confidence in the quality and safety of food products. Hence, the extreme importance of control and follow-up standards, a responsibility not only of the CFIA and other certified organizations but also of the industry.

Food Safety

As in other industries, all the links in the agri-food chain — both the production as well as the processing and marketing of food products — must meet safety requirements. Thus, every effort is made at all levels of the chain to reassure consumers about the quality and safety of products. One way in which this commitment is now upheld is through *traceability*. This is a system that can be referred to through all stages of production to obtain information about the product's origin, attributes related to quality, and the alterations it has undergone, right up to consumption. A good traceability system should also, at any point in time, identify the product's location in the agri-food chain.

60. A moratorium was imposed on the construction of new hog farms in Quebec while there has been public opposition to the pork industry in New Brunswick.

61. This is the case in Prince Edward Island. For an in-depth examination of this subject, see report entitled "Effects of Land Use Practices on Fish, shellfish, and their Habitats on Prince Edward Island," Fisheries and Oceans Canada, Regional Habitat Status Report, 2000.

In such a system, the product bears a label indicating the producer, slaughterhouse, processor, distributor and retailer.⁶²

Incidents that periodically undermine the quality of the environment and especially food safety have the effect of bringing the concept of sustainable development to the fore. Although the trend towards all-natural foods is not a guarantee of food safety, it nevertheless constitutes an environmentally friendly practice that is likely to reassure consumers. At the same time, it opens up new avenues for research and development, innovation, and trade prospects. Partly in reaction to fears related to food security, but perhaps more due to population aging, the demand for products labelled as organic and nutraceutical is growing. Indeed, the participants in the sectoral agri-food roundtables in Quebec, which deliberated in 2001, immediately recognized the potential of this sector. Their summary report states that the prospects for organic foods and health foods, mainly nutraceuticals and functional foods, are highly promising.⁶³

A few years ago, it was estimated that nearly one-third of the US population regularly bought organic products or goods that were produced using "natural" methods. In addition, sales of organic products in the United States increased from \$1 billion in 1990 to \$5.5 billion in 1998.⁶⁴ More recent assessments by the U.S. Market for Organic Foods and Beverages indicate that the sales of these products increased to \$11 billion in 2002, a 1,000 percent increase since 1990.⁶⁵ During 2002, some 22,000 new food products were added to retailers' shelves, a 15 percent increase over the previous year. Nearly half of these new products are grouped into four categories: confectionery products, pastry, beverages, and sauces.⁶⁶

This phenomenal growth is due to a number of factors, among them the new federal regulation on labelling and consumers' increased awareness of natural food products. A recent survey revealed that the majority (58 percent) of American consumers have bought organic

62. See MAPAQ, "La traçabilité : un outil au service de l'industrie des viandes," *Bioclips* + 2, no. 1 (January 1999).

63. MAPAQ, *L'industrie québécoise de la transformation alimentaire*.

64. See Organic Trade Association, *Business Facts* (2000).

65. See "Annual Sales of Organic Foods Grew 1000 percent between 1990 and 2002," *Supermarket Guru, Food and Health News* (7 June 2003); <http://www.supermarketguru.com/page.cfm/2035>.

66. See "2002's New Product Introductions," *Supermarket Guru, Food and Health News* (4 January 2003); <http://www.supermarketguru.com/page.cfm/600>.

products.⁶⁷ In fact the natural and organic food sector is highly dynamic: between three thousand and four thousand new products enter this market annually.⁶⁸ And this does not even take into account the potential linked to the know-how acquired in the production of genetically modified organisms.

The application of biotechnologies in the agri-food sector is opening the door to the development of customized products, products produced through optimal processes, and tools that are part of a quality approach. In economic terms, the growth of biotechnologies makes it possible to explore new, less traditional market niches, such as cosmetics, oral vaccines, etc. However, biotechnologies raise many concerns among consumers about issues of food safety, the environment, and ethics.

■ Main Industry Trends: Convenience or the Practical Aspect of Foods

Most trends in food consumption are shaped by the food culture, which differs from region to region. According to many observers, Americans continue to give priority to food convenience, while Europeans are more concerned about the “natural” aspects of foods and the Japanese focus on quality and safety. However, all the evidence suggests that expectations about food consumption will continue to revolve around quality and practical issues.

All the studies and surveys come to the same conclusion: the time devoted to preparing and eating meals is on the decrease. The future will consist of “assembly” cooking — prepared and take-away meals or substitutes for home-cooked meals.⁶⁹ In short, any high-quality product that saves consumers time has a good chance of success. This is true of refrigerated, or frozen-prepared, meals — for example, pizzas and subs, whose sales rose by 83 percent in Canada (from \$67 million to \$123 million) between 1995 and 1998. According to a study done in Canada by A. C. Nielsen, sales of frozen prepared meals reached

67. See Organic Consumers Association, “Americans Hunger for Healthy Options as Organic Foods Go Mainstream,” *Financial News* (10 December 2002).

68. Industry figures from the United States presented at North America’s All-Organic Conference and Trade Show, held in Austin in May 2003.

69. This category includes refrigerated or hot ready-to-serve meals, refrigerated or hot heat-and-serve meals, and ready-to-cook meals that require some preparation.

\$728 million in 1998, a 64 percent increase since 1995.⁷⁰ Moreover, the A. T. Kearney research firm of Chicago found that in the United States, sales of frozen and fresh meals totalled \$85 billion, a figure that could reach \$110 billion by 2002.⁷¹

In addition, contents, packaging, and containers are destined to change; product format may decrease in size or be redesigned; and packaging could become reusable, be adapted to a greying population — either the handling or readability of text (directions, list of ingredients, etc.) — or present a completely new image that better corresponds to the real needs of consumers.

Quality

Consumers concerned about their health are giving up certain light, low-fat or low-cholesterol products and focusing more on the content and quality of foods. We need only consider the many new products with nutritional claims that are appearing on food store shelves (see table 2). For consumers, quality is identified with food production methods, the safety of products, their nutritional value, freshness, and so on. Organic foods, functional foods,⁷² and nutraceuticals meet new concerns about health because they reduce health risks, are likely to be of better quality, and can even be used for therapeutic purposes. This would explain their popularity.⁷³

Main Industry Trends: Innovation Everywhere

Thus, the directions offered to agri-food businesses are based on new foundations. Businesses in this sector will tend to focus more on targeted markets. Faced with the saturation of the domestic market, they must broaden their sphere of action — by abandoning mass production and adopting methods of production, distribution, and promotion that target specific consumer groups or market segments. Among

70. From MAPAQ, Direction de l'appui aux entreprises, *Profil sectoriel : mets préparés surgelés et frais* (Quebec, MAPAQ, 2000).

71. *Ibid.*, p. 2.

72. Apparently there is no consensus on the meaning of the term *functional food*. According to Health Canada, a functional food “is similar in appearance to, or may be a conventional food, is consumed as part of a normal diet, and is demonstrated to have physiological benefits and/or reduce the risk of chronic disease beyond basic nutritional functions.” This definition is very broad and could apply as much to yogurt as it does to calcium-enriched juice. It clearly refers to products consumed as food and not as a pill, supplement, or medicinal potion.

73. See MAPAQ, “ ‘Comprendre’ les aliments fonctionnels et les produits nutraceutiques,” *Bioclips + 2*, no. 5 (December 1999).

the main assets of the business are creativity and diversity not only in designing and developing products but also in the area of management. In the management field, new concepts are emerging while old dogmas or paradigms such as competition, stability, and uniformity are giving way to partnership, creative instability of organizations, and a wide diversity of staff, skills, and processes. Moreover, the traditional organization chart of businesses is being replaced by simple, flexible, virtual connection networks.⁷⁴

New food production and processing technologies, resulting mainly from the growth of biotechnologies, are emerging and should spread in the years to come. For the most part, innovation in the agri-food sector occurs incrementally; that is, it advances little by little. It is stimulated by food industry suppliers, in particular by the suppliers of materials, ingredients, measuring and control instruments, and increasingly by services. A breakthrough for an emerging technology often occurs over a long period, especially if the particular technology does not give rise to either direct savings or benefits that are obvious to consumers. The future prospects for innovation will involve ingredients and foods with health claims and, more generally, products that provide an additional advantage to consumers (convenience, taste, health-related); it will also be in the areas of conditioning, development of co-products, and, of course, improvements in safety (traceability, analyses, decontamination).

Broadly speaking there are two types of motivation underlying food innovation: offensive innovation and defensive innovation.⁷⁵ The former motivates processors to stand out from their competitors, diversify their product line, and either increase productivity or enter new markets in order to increase their turnover or profit margin. In other words, they are motivated by the desire to increase market share, value added, or sales volume. The goal of defensive innovation, on the other hand, is to anticipate the loss of markets and thus to replace products, ingredients, or processes that are unpopular with customers (consumers or distributors). The perception of risks related to foods has increased considerably in recent years as a result of the many crises that have rocked the sector. In response, processors are

74. Philippe Maoti, "L'entreprise du XXI^e siècle : le retour de l'entrepreneuriat?," Délégation à l'aménagement du territoire et à l'action régionale (DATAR), *Études et prospective*, no. 5 (March 2002).

75. Agence nationale de valorisation de la recherche (ANVAR), *Agroalimentaire : innovation et prospective* (Paris: ANVAR, October 2002).

maximizing guarantees, often going beyond regulatory precautions. Safety in its broad sense has undoubtedly become a driving force behind technological innovations in the agri-food sector.

Competition has increased over the last ten or fifteen years, and concentration among processors and their customers is on the rise. Large distribution now has a strategy for innovation, quality, broadening product lines, and reassuring consumers about its products. To maintain their market shares, agri-food SMBs must employ the techniques of offensive innovations, which can mainly be done in market niches. Differentiation based on competition or increasing productivity takes second place.

The results expected from these technological developments are faster and better controlled growth, longer food storage, improved quality control, and a supply of diversified and user-friendly products, combined with more environmentally friendly production and consumption activities. Beyond commodities produced through biotechnologies,⁷⁶ that is, from advances in the field of genetic engineering,⁷⁷ the following practices in the field of food processing, preparation and storage appear to be highly promising:

- ▶ **“Minimum alteration” technologies.** Several technologies that use pulsed electric fields, pulsed light and high pressure, and ohmic heating by microwave or radio frequency only minimally alter the basic properties of products and therefore constitute an improvement in food storage. In addition, some of these technologies are energy efficient.
- ▶ **Electro-chemical technologies.** These technologies make it possible to extract and separate substances or even to stabilize food systems. They have many applications, from clarification of fruit juices to demineralization or acidification of dairy solutions. This

76. Biotechnology refers to all the techniques used on living organisms or parts of organisms (animals, bacteria, or plants) to produce goods or render services. The science is several centuries old. The use of yeast to make bread, wine, and beer and bacteria for cheese and thick milk has a long history. Today, thanks to scientific advances, not only can we identify organisms, but we can also define their composition, characterize their active elements, and even modify their molecular structure to create new strains or species. From MAPAQ, “‘Comprendre’ les aliments fonctionnels.”

77. Genetic engineering, through various techniques, makes it possible to directly manipulate genes to accelerate the process of natural selection. It facilitates the insertion of genes in organisms which will then display a new characteristic. It is one of the tools of biotechnology. Ibid.

approach can be used to reduce proteins in a solution, for example, and thus to modify their storage and functional properties.

- ▶ **Electronic pasteurization (irradiation and X-ray processing).** These technologies are increasingly recognized for effectively fighting foodborne pathogens or other harmful bacteria. X-ray processing is faster and more flexible and environmentally friendly than conventional irradiation processes. In the United States, facilities for X-ray processing of meat are beginning to appear now that the Food and Drug Administration (FDA) has approved the use of this technology in processing meat, poultry, vegetables, grains, and spices.
- ▶ **Supercritical extraction.** Most often using carbon dioxide, this technology makes it possible to gently isolate or split different substances without compromising their biological activity or altering them. In the case of milk fat, for example, it is possible to isolate different fat fractions with specific properties that are perfectly suited to the intended use. This technology also has applications to the extraction of nutraceutical compounds.
- ▶ **Innovations in packaging and wrapping.** Packaging and edible wrapping with a protein or complex sugar base and films that incorporate substances that have antimicrobial or oxydation-resistant properties could revolutionize the way containers are disposed of and even their contents.⁷⁸

These various technologies could markedly change the industrial image of food processing. In concrete terms, they should encourage the development of innovative products and more versatile processes or ones that are less damaging to the sensitive constituents of foods. Thus, they should make it possible to produce high-quality foods that are just as harmless as conventional foods.

While these new technological developments are fascinating and promising, they alone cannot ensure that the agri-food industry remains dynamic. As in other economic sectors, innovation in this industry does not only apply to processes or products. According to the economist Michael Porter, “Innovation is more than just scientific discovery,” and “there are no low-tech industries, only low-tech

78. MAPAQ, “Écho des tendances dans le secteur agroalimentaire,” *Bioclips* + 4, no. 2 (March 2001).

firms.” Porter notes that a region’s (or an industry’s) competitiveness is determined by its productivity, in other words, the efficiency with which it uses its productive resources, that is, its human, capital, and natural resources. However, he goes on to say that productivity depends on both the value of products and services and the efficiency with which they are produced.⁷⁹ Innovation thus encompasses a wide range of creative activities carried out to increase a business’s market share or profitability. Innovations include new or significantly improved products and services (innovations in products or services), new or significantly improved manufacturing techniques (innovations in processes) or, new or significantly improved methods of business organization (organizational innovations).⁸⁰

Diversification of demand and competitive pressures require that businesses continually think about productivity and innovation. Clearly the future of the agri-food industry lies increasingly in its capacity to innovate, that is, to create new products and processes and to introduce new practices and modes of organization and knowledge management. In a context where regional businesses must face increasingly strong competitors, they must necessarily rely on innovation to stand out. To do this, they will have no choice but to incorporate innovation into their strategy — making it the focus of their efforts to improve their competitive capacity — and to adapt their organization accordingly.⁸¹

However, technology is disseminated above all through the business itself, its access to and participation in information networks, its relations with other businesses, a strategic surveillance of the competition (the technical analysis of competitors’ products is an important source of information), customer-supplier relations, or even through subcontracting. According to the economists Baldwin and Peters, innovation is a process that evolves best within a network where there is intense interaction between buyers and sellers of goods, services, knowledge, and technology. This occurs because innovation depends on sources of ideas, which can be found both inside and outside the business. It follows that external or secondary sources of innovative

79. Michael E. Porter, *Competitiveness and the Role of Regions* (Boston: Institute for Strategy and Competitiveness, Harvard Business School, 2002), 2.

80. OECD, *The Measurement of Scientific and Technological Activities: Oslo Manual*, chapter 3 (Paris: OECD, 1996), 36–37; <http://www.oecd.org/dataoecd/35/56/2367523.pdf>.

81. This emerged during the discussions of the sectoral agri-food round tables in Quebec. See MAPAQ, *L’industrie québécoise de la transformation alimentaire*.

ideas (customers and suppliers) are as important as any R & D that originates from within the business.⁸² When a detailed analysis of the linkages between industries was conducted by these researchers, they found that 30 percent of agri-food businesses in Canada depend primarily on their suppliers for innovation; this figure climbs to 45 percent in the case of customers or buyers.⁸³

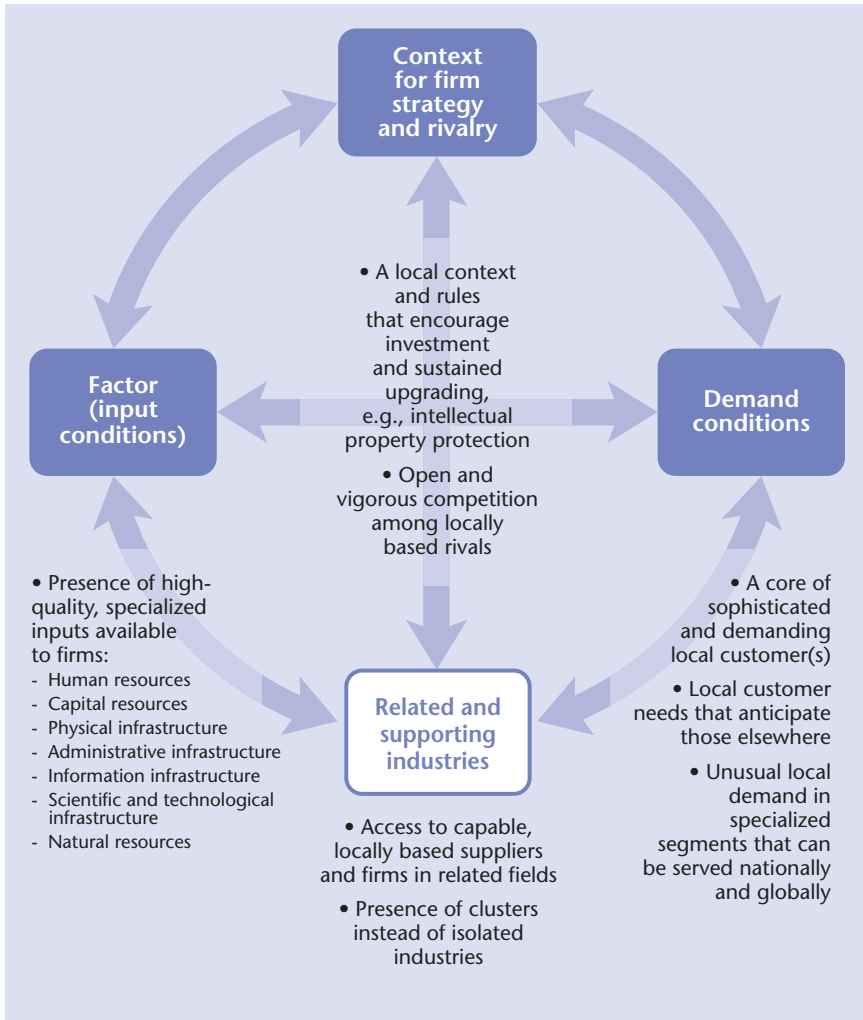
To conclude, rather than focusing on their intrinsic capacity for technological development, local and regional businesses should concentrate on their capacity to absorb and integrate new technologies and processes in order to improve their competitive position. Technological capacity is indeed dependent on a whole set of factors, including the presence of infrastructures and specialized services in the technical, financial, management, and marketing fields as well as a good education and training system. These are all elements that support the business climate and the propensity to innovate. To illustrate this, see figure 6, which was taken from Michael Porter's work.

In Atlantic Canada as elsewhere, SMBs in the agricultural and agri-food sector generally resort to their suppliers, especially to their customers-buyers, to improve their technological capacity. The latter, who set the requirements, particularly with subcontractors, are very important, as are consultancy firms, research institutes, and industrial partners.

82. John R. Baldwin and Alice Peters, *Innovation and Connectivity: The Nature of Market Linkages and Innovation Networks in Canadian Manufacturing* (Ottawa: Statistics Canada, Analytical Studies Branch, 2001), 1.

83. *Ibid.*, tables 6 and 7, 16.

Figure 6
Productivity and the Business Environment



Source: Michael E. Porter, *Competitiveness and the Role of Regions* (Institute for Strategy and Competitiveness, Harvard Business School, 2002), 3.

Well-Orchestrated Commercial and Distribution Strategies

The challenge of innovation in the agri-food industry is thus taking on a global dimension. In addition to product innovation,⁸⁴ it implies reorganizing work, reorienting occupational training, and adapting institutional and regulatory frameworks. The issues are especially important in the organization of production (supply strategies; technological inputs and know-how, particularly related to presentation and packaging; and product quality) and in distribution-marketing (industrial and commercial strategies).

The rapid internationalization of the market for food products makes their marketing more complicated. In such a competitive context, businesses must be flexible, efficient, and innovative. And they must pay more attention to factors such as the search for competitiveness, the ability to listen and respond to demand, quality requirements, and the incorporation of technical innovations. Food distribution will also have to adapt to this constantly evolving world and give priority to certain commercial strategies.⁸⁵

The range of products in supermarkets and among certain distributors is growing increasingly wider, a process of diversification which should continue. During 2002 alone, twenty-two thousand new food products were made available to American consumers. These included high-quality products, exotic foods, and many meal solutions. To counter this growing number of products, distributors must often reduce their selection of brands. Only the most profitable brands that meet goals established by the management strategy for that category appear on the shelves. Thus, one of the outstanding trends in recent years is unquestionably the development of private-brand products. The main purpose of these products, which have a retailer's label, is to develop consumer loyalty.

According to a number of observers, therefore, it seems unlikely that there will be an increase in the number of brands in supermarkets in the years to come. To make up for it, food service establishments may showcase several national-brand products.

84. This does not necessarily involve the design of new products, but it must lead to a differentiated output. This may mean a more suitable presentation (packaging, size), an improved recipe (additions of new ingredients such as spices, sauces), or even new ways to attract consumers (targeted marketing strategies).

85. Beaudin, *Towards Greater Value: Enhancing Eastern Canada's Seafood Industry*.

■ Conclusion: Main Trends

The main trends that were examined above are not necessarily new in themselves, nor have they suddenly appeared. Nevertheless, their effect is magnified in the current context, which is marked by the emergence of the information economy and the globalization of markets. According to several observers, the coming years will be decisive for the agri-food industry. Driven by population aging and globalization, the businesses in this sector will have to review their organization and the way they interact with the environment. Moreover, they will have to make judicious use of the technological advances that are rapidly being made. In the end, their chances of success will largely depend on being attentive to consumers' needs and encouraging adaptability and ingenuity.

Under pressure from this growing and seemingly limitless trend, the political and regulatory framework must also evolve. Thus, to keep pace with this trend, the state must change its role. Its interventions must be aimed above all at ensuring the safety and quality of food products and protecting the environment for the sake of the public good. This timely mission⁸⁶ should of course be part of a process that encompasses the agri-food world and takes its needs into account.

86. This approach seems to be highly relevant in the wake of recent cases of mad cow disease in Canada and the United States. Though isolated, these are nevertheless serious incidents.

Chapter 3

Sectoral Bases: Crop Production and Animal Production

The economy of Atlantic Canada is largely based on food production, which represents 24 percent of total manufacturing shipments, as compared with 10 percent in the rest of the country. The food sector is supported by two pillars, marine and agri-food products, which can be subdivided into the primary level (fisheries and agriculture) and the secondary level (processing of marine and agri-food products). In Atlantic Canada, the marine product sector is relatively dominant, accounting for nearly six out of ten jobs in the food industry in 2001; however, it generates only 53 percent of manufacturing wages in the industry, 50 percent of manufacturing shipments, and under 40 percent of value added.⁸⁷

These differences are mostly explained by higher seasonal employment in the marine-product-processing sector.⁸⁸ This sector is more oriented towards exports, accounting for over 75 percent of the region's total food exports.⁸⁹ The situation is quite different in the country as a whole, where the agri-food sector dominates the food industry with more than 90 percent of manufacturing shipments and 80 percent of exports. Unlike other Canadian regions where agriculture is dominant, fisheries and marine product processing play the leading role in Atlantic Canada.

It should be noted that within Atlantic Canada, the industrial profile varies by province or region. Thus, in the three Maritime provinces, agri-food processing accounts for 43 percent of workers and 57 percent of manufacturing wages in the food sector. Agri-food processing occupies the top position in Prince Edward Island, where agri-food products account for 66 percent of food-manufacturing

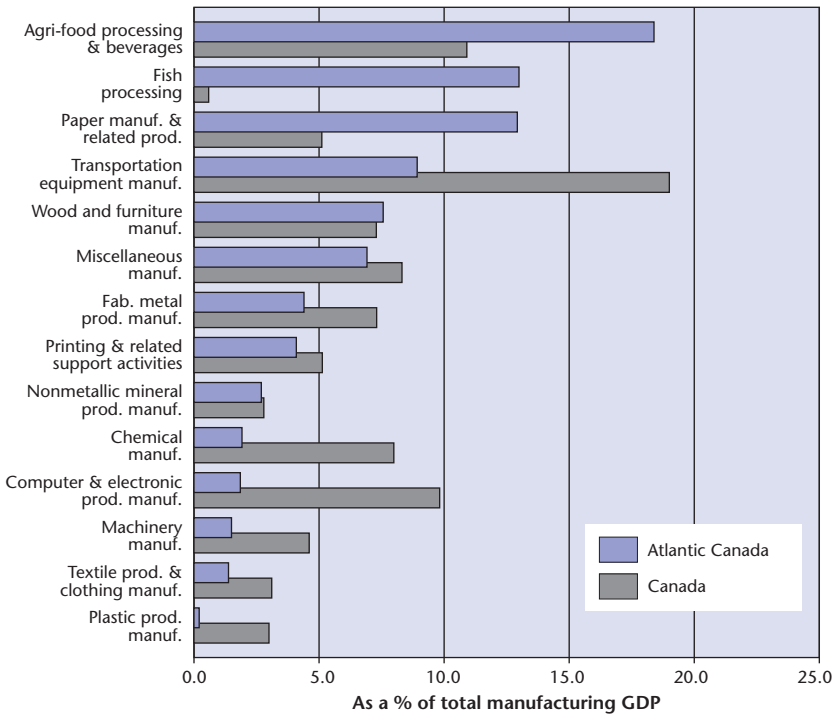
87. Based on data from the 2001 census and the *Annual Survey of Manufactures*; author's compilations.

88. The rate of seasonal work in Atlantic Canada is 23.7 percent in the agriculture sector versus 59.5 percent in the primary fisheries sector, and 10.0 percent in agri-food processing versus 43.8 percent in fish processing. Author's calculations are based on 2001 census data.

89. Author's calculations are based on data from the *Annual Survey of Manufactures* and from Industry Canada's STRATEGIS bank for exports.

shipments, a proportion that rises to 78 percent for value added. In the Maritime provinces, 14 percent of manufacturing jobs are found in agri-food processing, compared with 10 percent in Canada. Similar gaps exist for the sector’s sales value. Moreover, the sector represents 18 percent of the manufacturing GDP in Atlantic Canada, compared with 12 percent for Canada as a whole. Thus, in terms of contribution to the GDP, agri-food dominates the region’s various manufacturing sectors (see figure 7).

Figure 7
Share of Manufacturing GDP by Sector,
Canada vs. Atlantic Canada, 1999



Source: Statistics Canada, matrices 8418, 8419, 8420, 8421, and 4677; compiled by the author.

■ Relative Importance and Interdependency of Sectoral Bases

The combined sectors of agriculture and processing-manufacturing of agri-food products employ over forty-four thousand workers in Atlantic Canada and generate approximately \$1 billion in employment income (see table 1). In the regional context, these figures are far from insignificant. Even so, the industry has not been given its due, especially in light of its good prospects for expansion. To fully grasp the extent of the industry, its basic sectors should be viewed as the first links in a vast chain which connects agriculture to consumers.

As we have seen, the agri-food system incorporates numerous segments of the regional economy. Agri-food industries have developed according to a dynamic process of the division and reconfiguration of labour between agriculture and industry. In the beginning, as one might expect, these industries were highly dependent on agriculture, and their activities were limited to stabilizing farm products by simply conditioning and storing them. This primary processing of farm products continued for some time. Then, as the agri-food industries improved their manufacturing processes and incorporated more and more services into their production, they broke free from agriculture, and struck out on their own. This led to the emergence of secondary-and-tertiary-processing industries.⁹⁰

Two components — agriculture, on the one hand, and the processing of crop and animal products, on the other — make up what is generally referred to as the “sectoral bases” of the entire agri-food system. One could not survive without the other. Moreover, this interdependency accounts for the parallel path of these two vectors, which are increasingly interlinked through supply contracts, the application of common quality and hygiene standards, and the vertical and horizontal integration of businesses. For example, to guarantee their supply of primary products based on the desired specifications and volumes, large businesses often make specific contracts with suppliers which clearly stipulate the production method, targeted quantities, production schedule, etc. They even get involved in the development or input of seeds while offering technical services and advice to agriculture and pesticide management.⁹¹

90. FAO, *The State of Food and Agriculture, 1997* (Rome: FAO, 1997).

91. See ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ), “Leaders en transformation alimentaire : quelles sont leurs stratégies?” *Bioclips* + 3, no. 2 (June 2000): 4.

In Atlantic Canada, these two sectors are even more interdependent since each relies heavily on the other either to sell its products (suppliers of primary products) or to obtain supplies of basic products (processors and manufacturers). On average, crop and animal producers in Atlantic Canada export between 15 and 20 percent of their products; the rest is sold on the Canadian market or to regional processors. The bulk of primary products is thus sold to processors and manufacturers. In Canada as a whole, the proportion of primary products exported is much higher, in the order of 35 to 40 percent. Moreover, crop and animal producers can take advantage of a rather dense domestic market that is delimited by the urban fringes of central Canada (Quebec-Windsor corridor) and western Canada (Calgary-Edmonton and Vancouver zones). In these urbanized spaces, it goes without saying that a greater share of basic products is sold directly on the local markets. The share available to the processing industry is therefore markedly lower.⁹²

We will now determine the principal characteristics of the two components of the region's agri-food industry, their linkages, the structure of the businesses which make up these two components, and their level of performance and competitiveness.

■ **Crop and Animal Production: First Link in a Vast System**

In the 2001 census, Atlantic Canada had 9,445 farms employing approximately 23,000 workers. More than 8,000 of these farms reported at least \$2,500 in revenue during the period 2001–3, for an average annual total of \$1.2 billion. The two major sectors that make up agriculture, namely, crop and animal production, generated 46 percent and 54 percent of market receipts respectively. Crop and animal producers receive an additional \$54 million per year in the form of program payments.⁹³

Although primary agriculture employs only a small proportion of workers, its impact on the provincial economies is considerable owing to its numerous links with other industries. A healthy agri-

92. It is impossible to measure accurately the share of primary sector products being sold to the region's processing industry. These estimates are thus based on the ratio between primary product exports, on the one hand, and, on the other, the relative size of markets in Atlantic Canada and in the rest of Canada. The type of primary products has not been taken into account either.

93. Statistics Canada, Historical Data (2001), cat. no. 21-603; Agriculture and Agri-Food Canada, forecast data for 2002 and 2003. Compiled by the author.

culture industry is crucial to the food-processing industries as well as to the entire agri-food system. A recent document produced by Agriculture and Agri-Food Canada underlined this strategic contribution: “The prosperity of agriculture and the agri-food industry in Atlantic Canada is based on its farms and the people who live there” (translation).⁹⁴ In the first place, farmers need machinery, tools, transportation, and numerous other inputs for crop and animal production (fertilizers, seeds, animal feed, etc.). Then they must resort to a vast array of specialized financial, technical, or other services. And finally, they sell their products to processors and intermediaries in the distribution chain who process, store, transport, and market the products to consumers. It is not surprising, therefore, that every job and every dollar of income in agriculture generates another four jobs and four additional dollars of income in the entire agri-food system.⁹⁵

A Continuing Trend towards Consolidation

In every national economy with a significant agricultural component, the agriculture industry has been beset by numerous changes that present technological, commercial, and organizational challenges. Moreover, agricultural businesses have been stricken not only with stagnation but also with a decrease in (real) farm prices, while their production costs have continued to rise. This imbalance has led to the trend towards consolidation, which allows economies of scale while encouraging specialization. Since this phenomenon has affected all industrialized countries, it is no surprise that its influence has been felt in Atlantic Canada. The number of farms in Europe decreased by 42 percent over the last thirty years, with small farms (five hectares or less) experiencing the sharpest drops.⁹⁶ In Canada, the number of farms declined by 11.8 percent over the last decade (1991–2001), even as their average acreage increased by 13.0 percent. The trend is similar if not more noticeable in the Atlantic region, where the number of farms decreased by 18.0 percent (from 11,519 to 9,445). In contrast, the average acreage of farms increased by 24.2 percent (from 231 to 287 acres) (see figure 8).

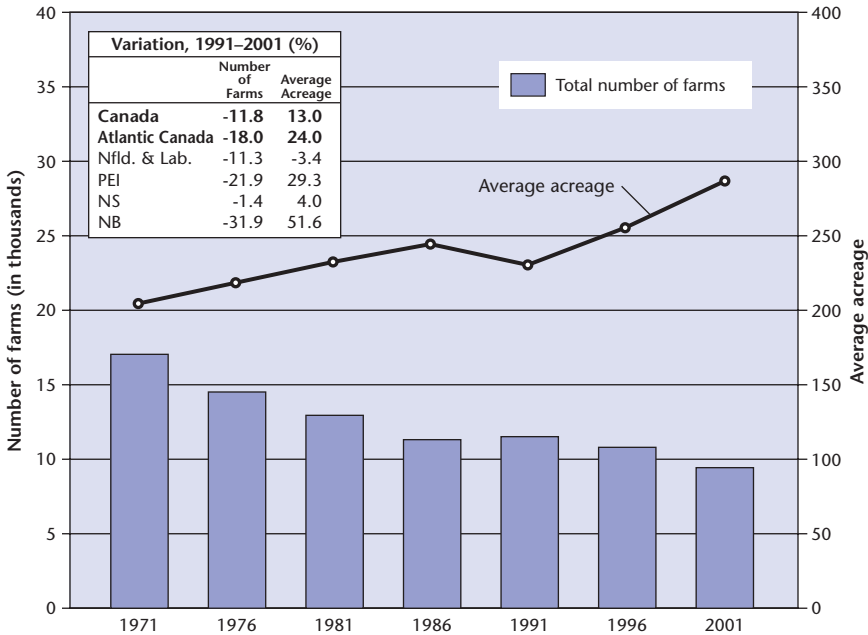
94. See Agriculture and Agri-Food Canada, Market and Industry Services Branch, *The Agri-Food Industry in Atlantic Canada* (Charlottetown: Atlantic Regional Office, 2001).

95. The agriculture sector directly employs 27,370 people in Atlantic Canada, while 117,535 other people are employed in farm-product-processing activities and related sectors (distribution, sales, etc.), that is, a ratio of 4.3 to 1. The ratio is 4.2 to 1 in terms of employment income. Author's calculations based on 2001 census data.

96. John Bryden, *Structural Changes in Rural Europe* (Winnipeg: Western Agri-Food Institute, 2001), 11–12.

Figure 8

Number of Farms and Average Acreage by Intercensal Period, Atlantic Canada, 1971–2001



Sources: Statistics Canada, *Historical Overview of Canadian Agriculture* (1997), cat. no. 93-358-XPB; Statistics Canada, *Census of Agriculture* (2001).

This means that according to the 2001 census, the four Atlantic provinces had 2,074 fewer farms than in 1991, but their total acreage was slightly higher (50,000 more acres), resulting in an increase in the average acreage. Although the trend that has seen farms abandoned and agriculture consolidating had declined in the late 1980s, it grew in the latter half of the 1990s, in particular in the crop (potato), cattle (for milk and meat), and poultry sectors. On the other hand, the number of operations specializing in small-fruit production (mainly blueberry and cranberry) increased from 931 to 1,071.

The sharpest drop in the number of farms occurred in New Brunswick (-31.9 percent) and Prince Edward Island (-21.9 percent). However, it was in those same provinces that the average acreage of farms increased the most rapidly — four times the national rate in New Brunswick and twice that rate in Prince Edward Island. In general, it is the small farming operations (receipts under \$10,000) that

have suffered most, followed by the medium-sized farms (\$100,000 to \$249,999), while large operations have done particularly well (see table 5).

Table 5
Distribution and Variation of Farms and Farm Workers
by Farm Receipts, Canada and Atlantic Canada, 2001

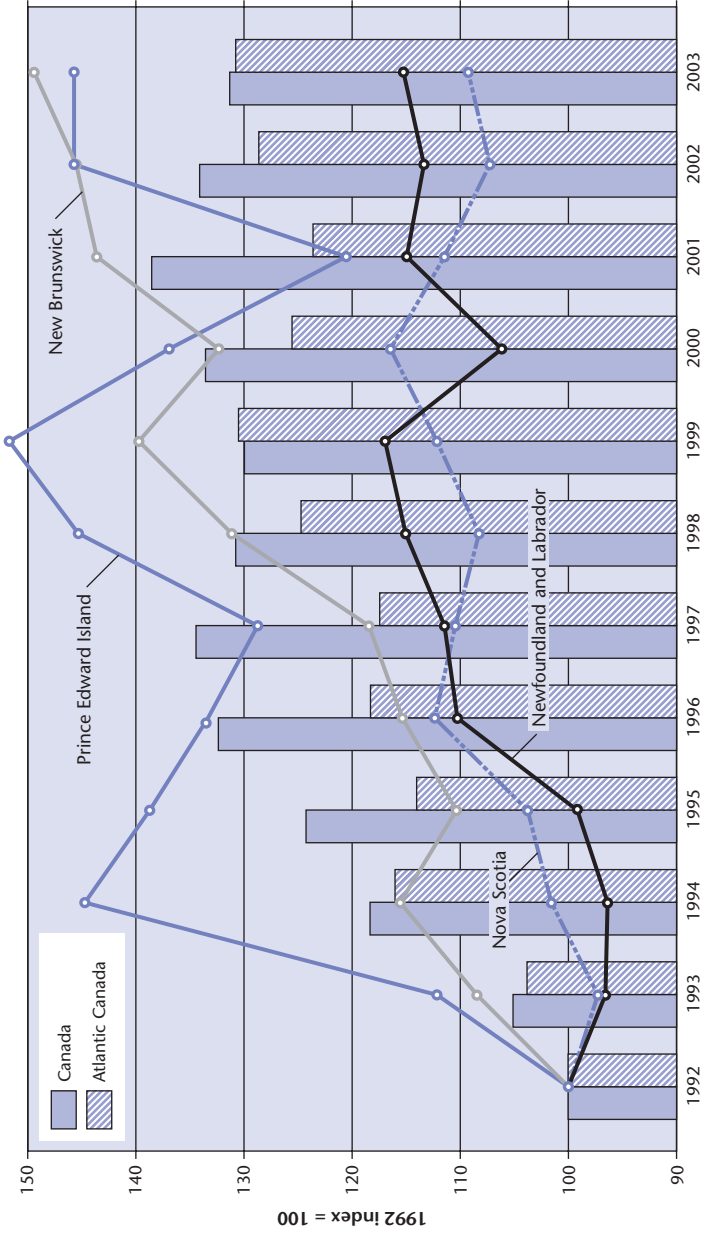
Farm Receipts	Reporting Farms			Other Farm Operators		
	2001 Number	Variation 1996–2001 (as a %)	Distribution in 2001 (as a %)	2001 Number	Variation 1996–2001 (as a %)	Distribution in 2001 (as a %)
Under \$10,000	3,379	-22.7	35.8	656	-23.1	23.6
\$10,000 – \$49,999	2,771	-9.1	29.3	649	-10.0	23.4
\$50,000 – \$99,999	803	-4.7	8.5	227	-9.9	8.2
\$100,000 – \$249,999	1,095	-14.8	11.6	435	-13.9	15.7
\$250,000 – \$499,999	708	-0.1	7.5	367	-7.3	13.2
\$500,000 and over	689	23.3	7.3	431	11.7	15.5
Atlantic Canada	9, 445	-12.7	100.0	2, 775	-10.6	100.0

Source: Statistics Canada, *Census of Agriculture* (2001).

Cash Receipts on the Increase

The continuing decline in the number of farms or farming operations has resulted in the improved performance of most operations. This is confirmed by the level of farm receipts, which increased to \$1.3 billion in 2003 for the four provinces (47 percent of that came from crop production and nearly 50 percent from animal production). In real terms (taking inflation into account), agricultural production in the Atlantic region increased by 2.31 percent annually, or slightly less than the national average of 2.70 percent (see figure 9). These are good results for the region, which has managed to stay close to the Canadian average in spite of its demographic decline. Indeed, the population of the four Atlantic provinces has decreased by 1.6 percent over the last decade, while Canada as a whole saw an increase of 10 percent. As will be demonstrated below, the performance of the agriculture sector in Atlantic Canada has been supported not by the regional market but rather by access to other markets.

Figure 9
Real Growth of Farm Cash Receipts, by Province, Atlantic Canada, 1992–2003



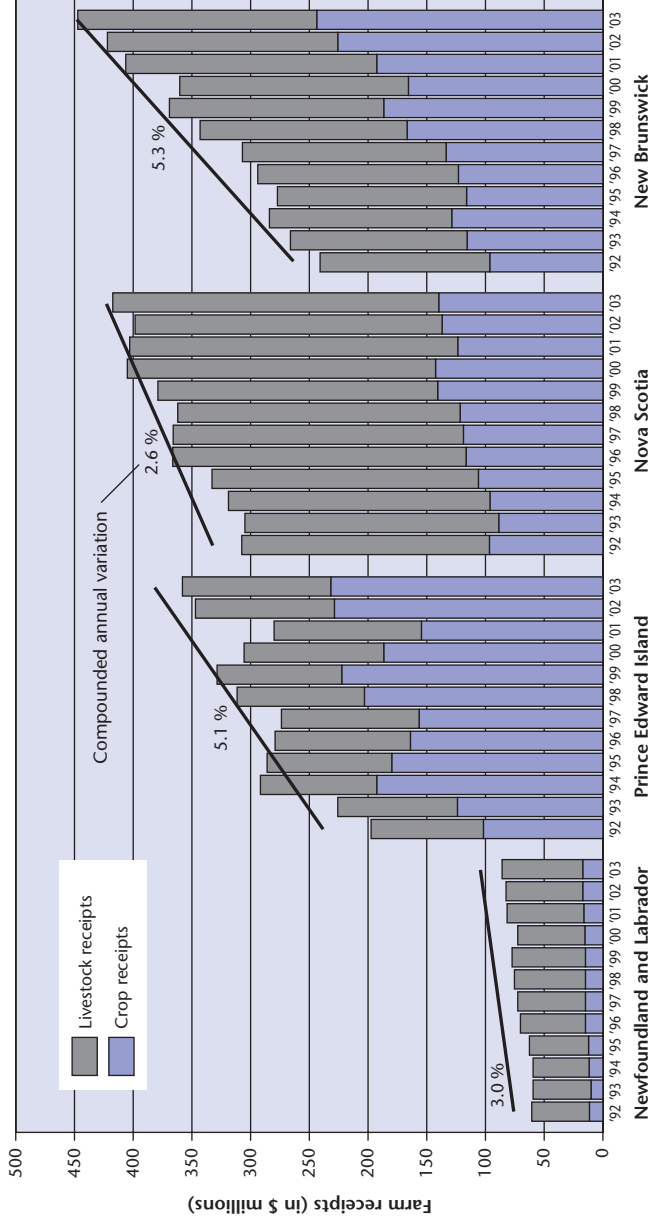
Source: Statistics Canada and Agriculture and Agri-Food Canada, *Farm Financial Survey: Data Book*, cat. no. 21-F0008X1B; compiled by the author.

New Brunswick and Prince Edward Island saw the highest increase in farm receipts, an average of 3.5 percent per year. In New Brunswick the growth rate has been steady; in Prince Edward Island, however, it has fluctuated considerably. These differences are mainly explained by the limited diversification of Prince Edward Island's production, which specializes in field crops, especially potatoes, where yields and farm prices can vary considerably. Nova Scotia's and Newfoundland's farm receipts have also increased, but only moderately.

While the size of the agriculture sector in the three Maritime provinces is relatively similar, their focus varies. In Prince Edward Island it is crop production that predominates, in Nova Scotia it is animal production, while in New Brunswick both agricultural sectors seem to share the cash receipts equally (see figure 10).

Crop receipts in New Brunswick have increased rapidly, from \$120 million in the mid-1990s to \$243 million in 2003, for an average annual increase of 8.0 percent. Intensive potato farming has been a major factor in this crop expansion. Receipts from the animal production sector have also increased, helping to make this province the leader in the Atlantic region in increased farm receipts (the average annual growth rate since 1992 has been 5.3 percent). Like New Brunswick, Prince Edward Island has seen strong growth in crop production, essentially potatoes, which is reflected in an average annual gain in receipts of 5.1 percent for the entire period. Nova Scotia follows close behind with a markedly slower production rate of 2.6 percent per year. Its crop production and animal production, which bring in one-third and two-thirds of farm receipts respectively, seem to be growing at a similar rate. The expansion of small-fruit production (blueberry) could revitalize the province's crop production sector to some degree. In Newfoundland and Labrador, the value of farm receipts has increased considerably — by 3.0 percent annually. Nevertheless, the value of agricultural production remains relatively modest; it is dominated mainly by animal production.

Figure 10
Farm Receipts by Sector (Cattle and Crop), by Province, Atlantic Canada, 1992–2003



Source: Statistics Canada and Agriculture and Agri-Food Canada, *Farm Financial Survey: Data Book*, cat. no. 21-F0008X1B; compiled by the author.

Moderate Dependency on Agricultural Transfers

Agricultural producers in Atlantic Canada receive program payments (agricultural transfers), which amount on average to approximately 4 percent of their market receipts. During the entire period 1990–2003, that average amounted to 4.42 percent per year; however, it has decreased to 3.94 percent over the last five years (1999–2003). Thus, the dependency of regional producers on agricultural transfers is less than half that of their Canadian counterparts, since in the country as a whole, program payments as a share of market receipts were 9.01 percent (1990–2003) and 10.09 percent (1999–2003). Over the last five years, crop and animal producers in Atlantic Canada have generated 3.85 percent of the country's farm receipts, but received only 1.50 percent of agricultural transfers (see table 6).

Table 6
Share of Government Transfers (Program Payments) to Agriculture,
by Province, Atlantic Canada, Annual Averages for 1990–2003
and 1999–2003

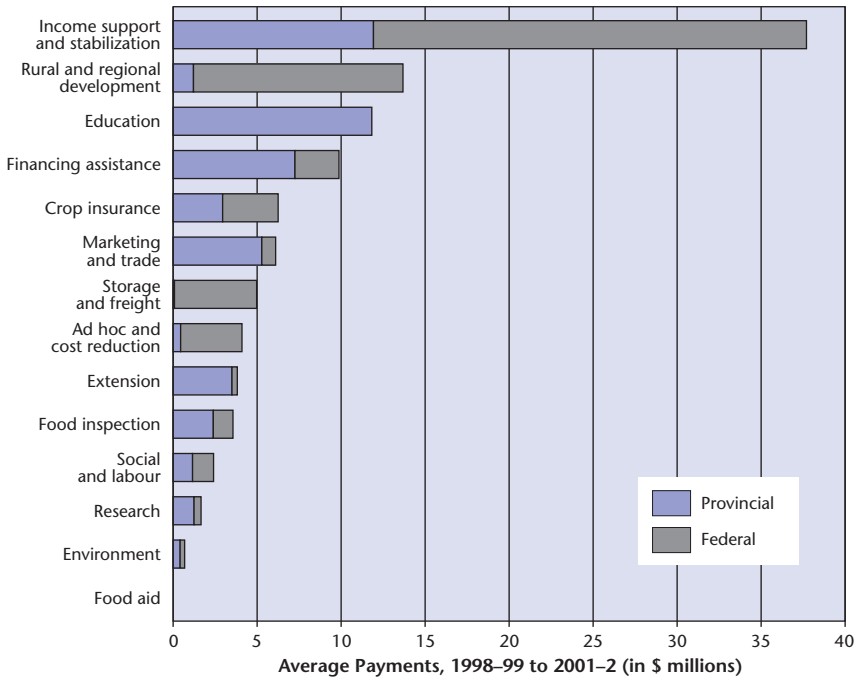
	Share of Payments as a Percentage of Farm Receipts, Annual Average		1999–2003	
	1990–2003	1999–2003	Share of National Farm Receipts (as a %)	Share of National Transfers (as a %)
Canada	9.01	10.09	100.0	100.0
Atlantic Canada	4.42	3.94	3.85	1.50
Nfld. & Lab.	3.79	0.84	0.25	0.02
PEI	7.27	8.11	1.03	0.83
NS	3.25	3.42	1.28	0.43
NB	3.36	1.71	1.28	0.22

Sources: Agriculture and Agri-Food Canada, Strategic Policy Branch, *Farm Income, Financial Conditions, and Government Assistance: Data Book* (March 2002), cat. no. A21-44/2002 for 1990–2000; Statistics Canada, *Agriculture Economic Statistics*, cat. no. 21-603 for 2001–2003. Compiled by the author.

The government assistance received by regional producers, modest as it is, is granted in different forms. It begins with payments from the Income Stabilization Program, which is implemented by the two levels of government though principally by the federal government. Other support programs, including Crop Insurance and Food Inspection, are financed more by the provincial governments. Figure 11 illustrates the amounts paid by the federal and provincial governments to producers in Atlantic Canada under the various programs.

Figure 11

**Average Support Program Payments to the Agriculture Sector,
by Category, Atlantic Canada, 1998–99 to 2001–2**



Source: Agriculture and Agri-Food Canada, Strategic Policy Branch, *Farm Income, Financial Conditions, and Government Assistance: Data Book* (March 2002), cat. no. A21-44/2002.

For a more detailed interpretation by province, we have drawn up a table which provides the amounts granted under support programs for the agriculture and agri-food (processing) sectors in each of the Atlantic provinces by both levels of government (see table 7). It shows that Prince Edward Island benefits the most, followed by New Brunswick and Nova Scotia. Indeed, for the period 1998–2001, government assistance to the basic sectors of agriculture and agri-food in Prince Edward Island represented an average of 31.6 percent of sectoral GDP. This percentage was markedly lower in Newfoundland and Labrador (12.3 percent), New Brunswick (14.4 percent), and Nova Scotia (15.4 percent) when compared with both Prince Edward Island and Canada as a whole (23.7 percent).

Table 7
Governments' Support to Agriculture and Agri-Food,
by Province, Atlantic Canada, 2001–2 Financial Year

	(\$ Millions)			As a % of GDP of Agriculture and Agri-Food	
	Agriculture	Agri-Food	Total	Average 1998–2001	2001–2
Newfoundland and Labrador					
Federal	8.8	8.9	17.6	5.1	5.6
Provincial	12.3	12.4	24.7	7.2	1.5
Total	21.0	21.3	42.3	12.3	7.1
Prince Edward Island					
Federal	30.8	30.9	61.7	16.0	18.0
Provincial	30.2	30.0	60.2	15.6	2.5
Total	61.0	60.9	121.9	31.6	20.5
Nova Scotia					
Federal	31.7	31.8	63.5	7.1	7.1
Provincial	37.1	37.1	74.2	8.3	0.3
Total	68.8	69.0	137.7	15.4	7.4
New Brunswick					
Federal	32.8	32.6	65.4	9.2	10.0
Provincial	18.1	18.4	36.5	5.2	0.4
Total	50.9	51.1	102.0	14.4	10.4
Canada					
Federal	3,321.9	3,315.9	6,637.7	12.9	14.0
Provincial	2,779.8	2,788.3	5,568.1	10.8	0.01
Total	6,101.7	6,104.2	12,205.9	23.7	14.0

Source: Agriculture and Agri-Food Canada, Strategic Policy Branch, *Farm Income, Financial Conditions, and Government Assistance: Data Book* (March 2002), cat. no. A21-44/2002; compiled by the author.

Note: Amounts are estimates.

A Diversified and Relatively Successful Agriculture Sector

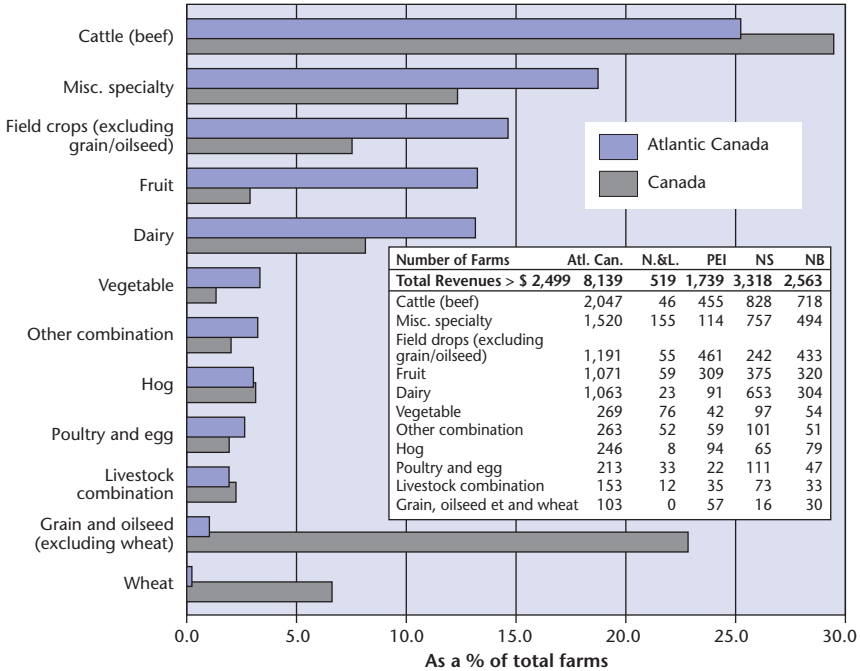
The differences in the structure and size of farming businesses across the country reflect, to some extent, the diversity not only of Canada's geography and climate (soil productivity) but also of its population density. The favourable conditions for field crop and animal production in the Prairies have been fully exploited to develop mass-production, export-oriented agriculture, while the mild climate of the Niagara Peninsula and the plains surrounding the large cities in central Canada has favoured a diversified agriculture which meets, first and foremost, domestic demand. In eastern Canada, however, the lower soil productivity and low population density have for a long time relegated agriculture to a subsistence level.

However, this pan-Canadian profile is rapidly changing. Compared with the other large regions of the country, the Atlantic provinces today have a relatively diversified agriculture sector, with farm receipts that are particularly well balanced. In the Prairies, the predominance of red meats as well as grains and oilseeds (accounting for more than 80 percent of farm receipts) has diminished owing to the expansion of many other crops, in particular potatoes. While dominated by the red meat sector, the agricultural industry in Ontario is nevertheless diversified. Slaughter animals and dairy production are the main segments of Quebec agriculture, while in Atlantic Canada, all the main production sectors, except for grains and oilseeds, account for a significant share of farm cash receipts. A simple examination of the distribution of farms and farming operations by production sector reveals that the configuration of the industry is more balanced in Atlantic Canada than in the country as a whole (see figure 12).

By all accounts, the configuration of agricultural activity in each of the large regions of the country is destined to change. On the one hand, farmers must continually adapt to the evolving business context. On the other hand, governments are striving, with the help of regional actors, to diversify the agriculture-based economies by focusing on value added and the emergence of innovative sectors within an industry which is still based on traditional mass production.

This is what is happening in the Prairies, where an intensive diversification of production occurred following the continuous decline in grain prices as well as reforms of domestic grain policy, in particular those associated with the *Western Grain Transportation Act*. Consequently, the share of grain in market receipts dropped considerably, from 42.6 percent in 1986 to 25.6 percent in 2000. During the

Figure 12
Farm Distribution by Activity, Canada vs. Atlantic Canada, 2001



Source: Statistics Canada, Agriculture Division, *Farm Cash Receipts: Agricultural Economic Statistics*, (November 2002), cat. no. 21-011-XIF.

same period, the share of the total income represented by red meats and special crops increased markedly.⁹⁷ The recently established partnership, under the leadership of AVAC and the Alberta’s Ministry of Agriculture, to support and stimulate agri-food production with value added is aiming at no less than \$20 billion in value-added products by 2010.⁹⁸

These trends are reflected in the indicators on farm size presented in the following figures. Figures 13 and 14 show the differences in farm structure between the Atlantic region and Canada as a whole, while figures 15 and 16 present the situation in each of the four provinces. We classified the farms by size using two indicators, capital value and total receipts. To make the comparisons easier, we grouped

97. Based on Agriculture and Agri-Food Canada, *An Overview of the Canadian Agriculture and Agri-Food Sector*; http://www.agr.gc.ca/cb/apf/pdf/bg_con_overvu_f.pdg.

98. AVAC Ltd., *2002 Annual Report*. AVAC is a not-for-profit private company dedicated to nurturing and developing value-added agriculture in Alberta. Through coaching, knowledge, contacts, and financial resources, the AVAC network invests in innovative ideas that add value to agricultural commodities.

the farms into six categories. These categories correspond to those used by the federal departments and agencies to classify farms by income.⁹⁹

Figure 13
Farm Structure Based on Capital Value,
Canada and Atlantic Canada, 2001

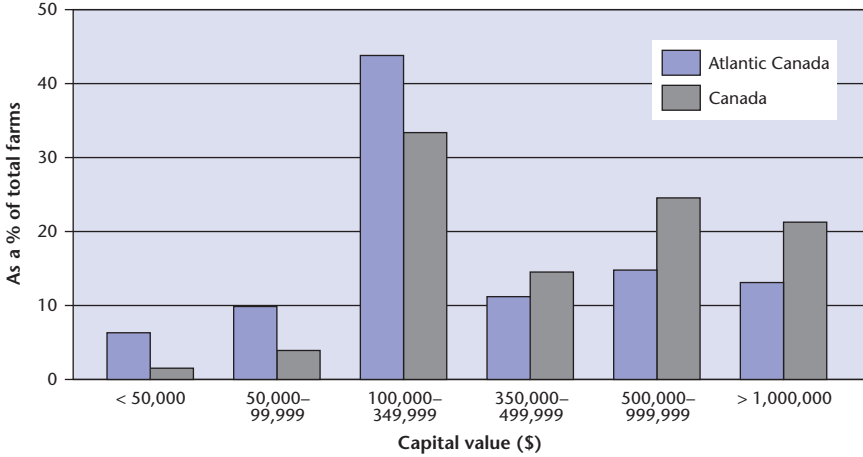
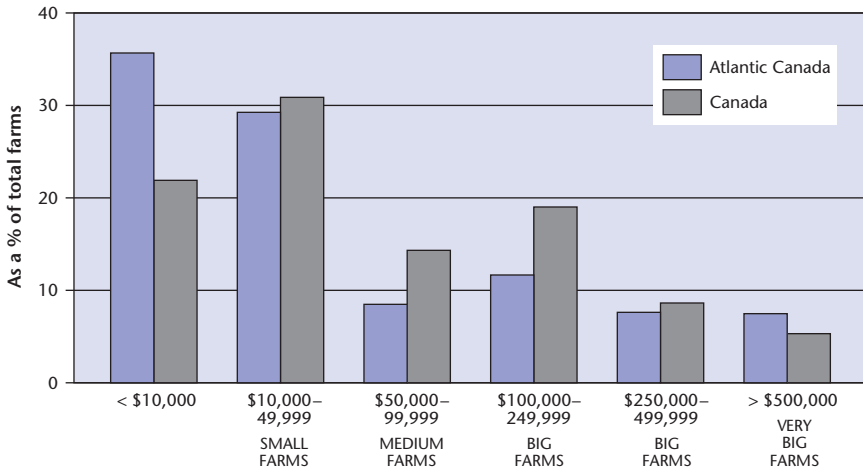


Figure 14
Farm Structure Based on Farm Receipts,
Canada and Atlantic Canada, 2001



Source: Statistics Canada, 2001 census; compiled by the author.

99. According to Statistics Canada, *small farms* are defined as those with receipts ranging from \$10,000 to \$49,999, *medium-sized farms* have receipts ranging from \$50,000 to \$99,999, and *commercial farms* have receipts of \$100,000 or more. To better understand the structural differences, we have subdivided the small and commercial farms into two groups.

At first glance, these figures seem to show that the structure of farming operations in both Atlantic Canada and the country as a whole is relatively similar. Thus, in terms of capital value, medium-sized farms make up the largest group in both regions, whereas farms with a capital value of \$100,000 or less are in a minority. This reflects the growing trend towards concentration in agriculture; that is, under-capitalized small farms tend to disappear or be absorbed by larger ones.

However, these figures also reveal marked differences. For example, there is a higher proportion of small- and medium-sized farms in Atlantic Canada, when compared with the country as a whole. Farms whose capital is worth less than \$100,000 make up 16.1 percent of all farms in the Atlantic provinces versus 5.2 percent in Canada. In contrast, commercial farms worth more than \$500,000 are proportionally more numerous in Canada (46.3 percent of farms) than in the Atlantic region (28.1 percent of farms).

An examination of farm distribution by province (see figure 15) reveals few significant differences within Atlantic Canada. However, two provinces stand out among their neighbours: the province of Newfoundland and Labrador has a higher proportion of small farms (capital less than \$100,000), while Prince Edward Island has, by far, the highest proportion of large farms. In this respect, then, the profile for Prince Edward Island is somewhat similar to that of the country as a whole.

The same exercise can be repeated using farm receipts (see figure 16). Here, gaps between the national values are not as wide as they are for capital value. Paradoxically, the region has a higher proportion of farms that belong to both the lower category (under \$10,000 of receipts) and the higher category (\$500,000 and over). Moreover, considerable differences between the Atlantic region and Canada as a whole (see figure 14) are noted in the category of intermediate-sized farms (\$50,000–\$249,999).

These structural differences based on capital value or level of farm receipts depend less on the geographical location of farms than on their type of activity. Some field crops (wheat, soya, potato) as well as cattle and hog breeding require vast means of production and consequently substantial capital. In fact, farms operating in these sectors need to be large in order to profit from economies of scale and thus maintain their profit margins. It is not surprising, therefore, to see the relatively large size of farming businesses in a small province like Prince Edward Island, given that its farmscape is largely dominated

by potato growing. In fact, year after year the potato sector by itself brings in approximately half of the crop receipts in the Maritime provinces. Dairy, hog, cattle, and poultry farms also represent a large part of the region's receipts. In Canada, the average size of crop and animal production businesses is determined to a large extent by the growing of wheat, barley, and soya and by cattle breeding.

Figure 15
Farm Distribution Based on Capital Value,
by Province, Atlantic Canada, 2001

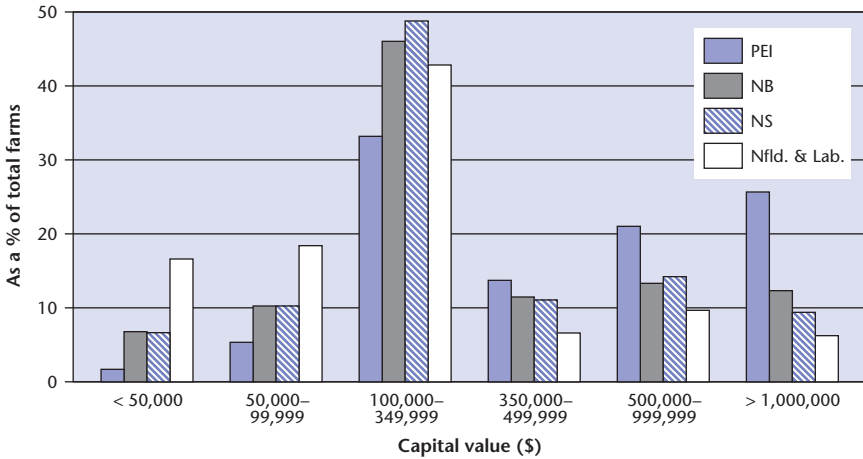
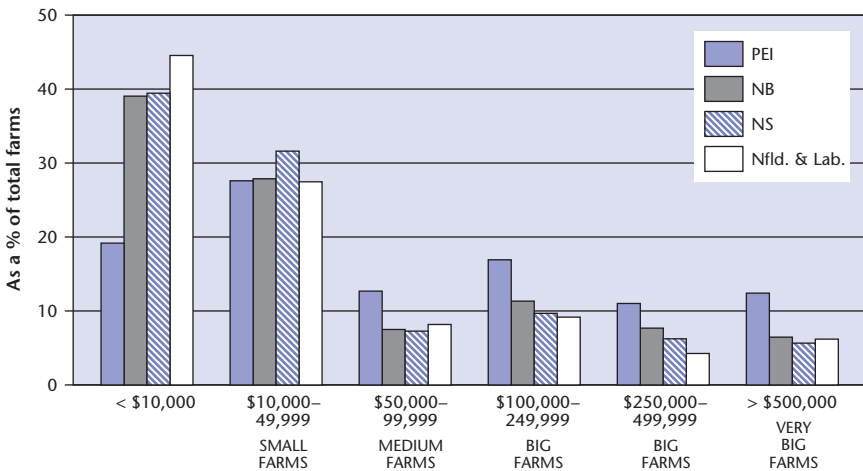


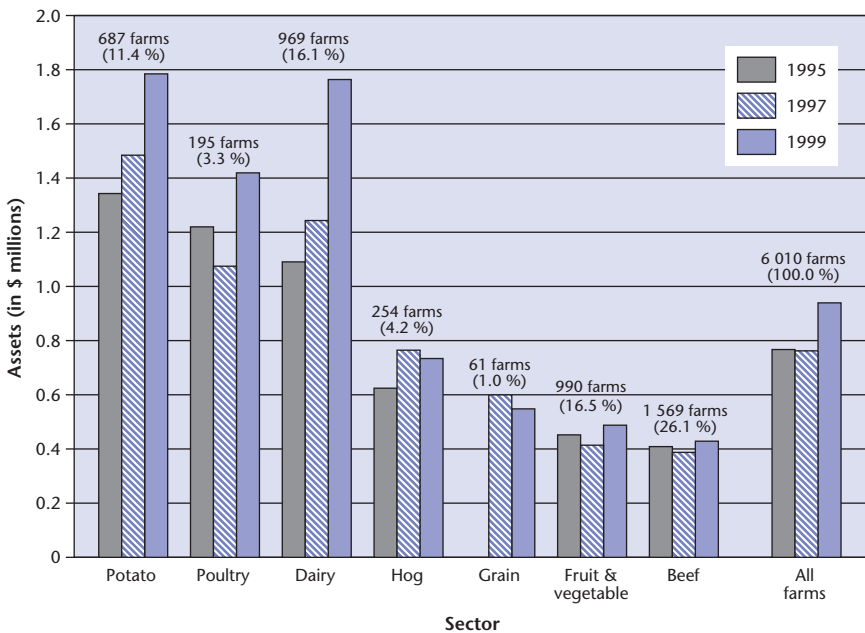
Figure 16
Farm Distribution Based on Farm Receipts,
by Province, Atlantic Canada, 2001



Source: Statistics Canada, 2001 census; compiled by the author.

The Maritimes have been successful at exploiting the distinctive characteristics of their soil and climate in order to develop at least one product on a large scale, potatoes, as well as certain growth areas, in particular small fruit. The region has also benefited from, and even taken advantage of, the national supply management program in the poultry and dairy production sectors. These three sectors have made considerable progress in Atlantic Canada, as shown by the evolution of average farm assets (see figure 17).

Figure 17
Average Assets per Farm, by Sector,
Atlantic Canada, 1995, 1997, and 1999

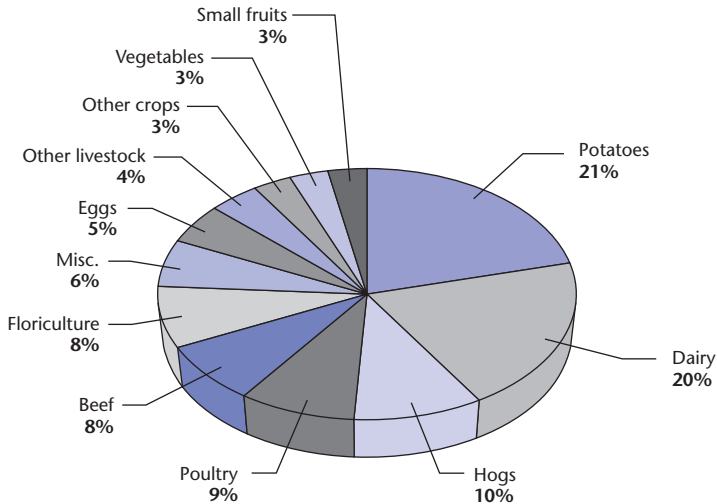


Source: Statistics Canada, Agriculture Division, *Farm Financial Survey* (2000), cat. no. 21-F0008XIB; compiled by the author.

As Figure 17 shows, operations in the potato, dairy production, and poultry sectors accumulated assets ranging on average from \$1.4 million to \$1.8 million in 1999, compared with under \$1 million for all farms. In fact, in addition to hog breeding, these three types of production generate 60 percent of farm operators' market receipts (see figure 18). In the country as a whole, these four sectors provide slightly less than 30 percent of farmers' market receipts.

Figure 18

Major Agriculture Sectors Based on Percentage of Total Farm Receipts, Atlantic Canada, 2001



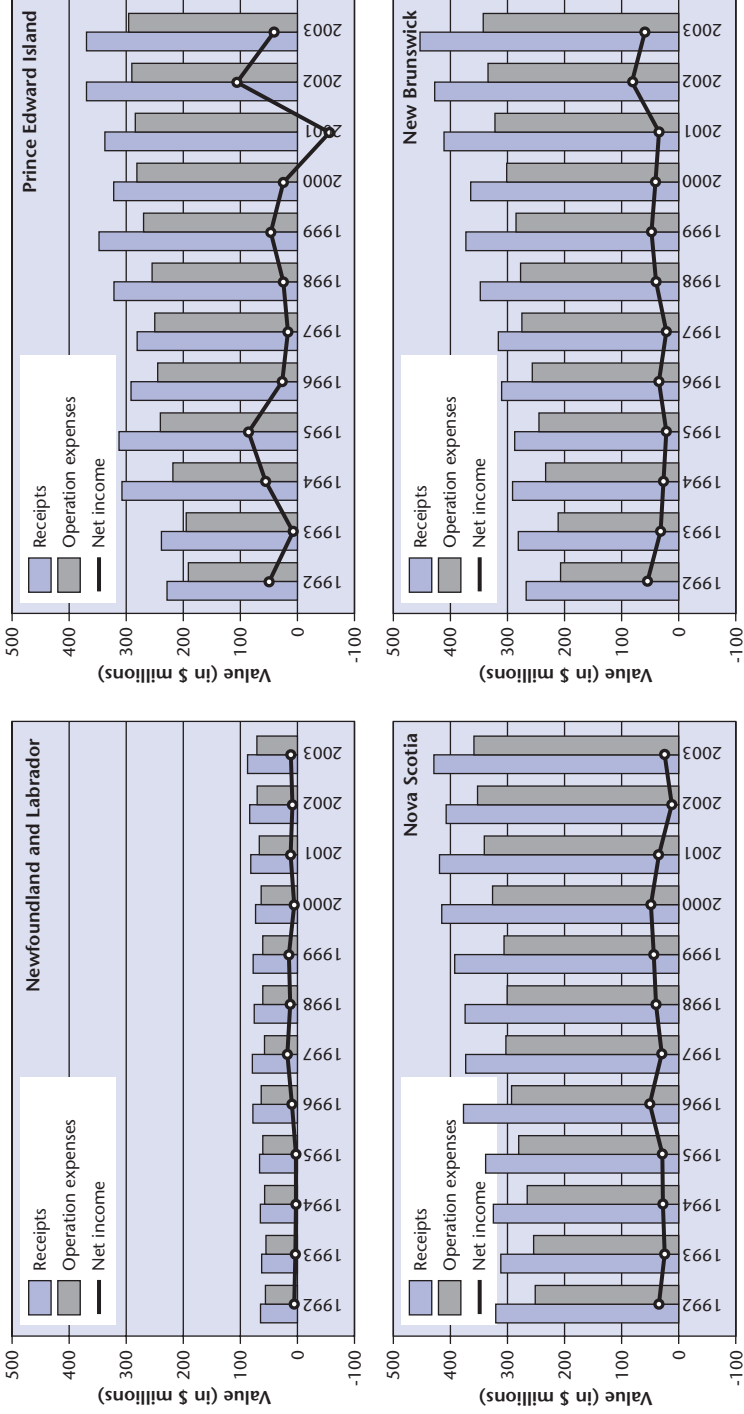
Source: Statistics Canada, Agriculture Division, *Farm Cash Receipt: Agriculture Economic Statistics*, vol. 1, no. 2 (November 2002), cat. no. 21-011-XIF.

Steady Returns despite Rising Operating Expenses

Although the structure of their operations is more modest, crop and animal producers in Atlantic Canada are in a relatively good position compared with their counterparts in the other regions of the country. First, in absolute terms, there has been a growth in receipts from crop and animal production in the region. For the past twelve years (1992–2003), the average annual growth of farm receipts has been just as strong in Atlantic Canada as in the country as a whole (3.6 percent). The performance of New Brunswick (4.5 percent) and Prince Edward Island (4.1 percent) in this respect has been excellent. The trend in Atlantic Canada is thus comparable to the national average, even slightly better in recent years. The balance sheet of the agriculture sector is evolving favourably in each of the provinces, although considerable fluctuations have been noted in Prince Edward Island (see figure 19), explained in large part by the high dependency on potato growing (approximately 50 percent of total farm receipts).

Figure 19

Evolution of Farm Receipts, Expenses and Net Income, by Province, Atlantic Canada, 1992-2003 (In Millions of Dollars)



Source: Statistics Canada, Agriculture Division, Farm Cash Receipts: Agricultural Economic Statistics, cat. no. 21-011-XIF.

Although receipts are increasing, so too are operating expenses. Thus, the net operating income has been increasing slowly, with marked fluctuations in some years. Figure 20 presents the curve of farm-operating expenses in Canada and the Atlantic provinces and shows that on the whole, operating costs have increased considerably everywhere. This increase is undoubtedly due to both rising costs and the absolute increase in expenses (investments resulting from farm expansion or modernization).

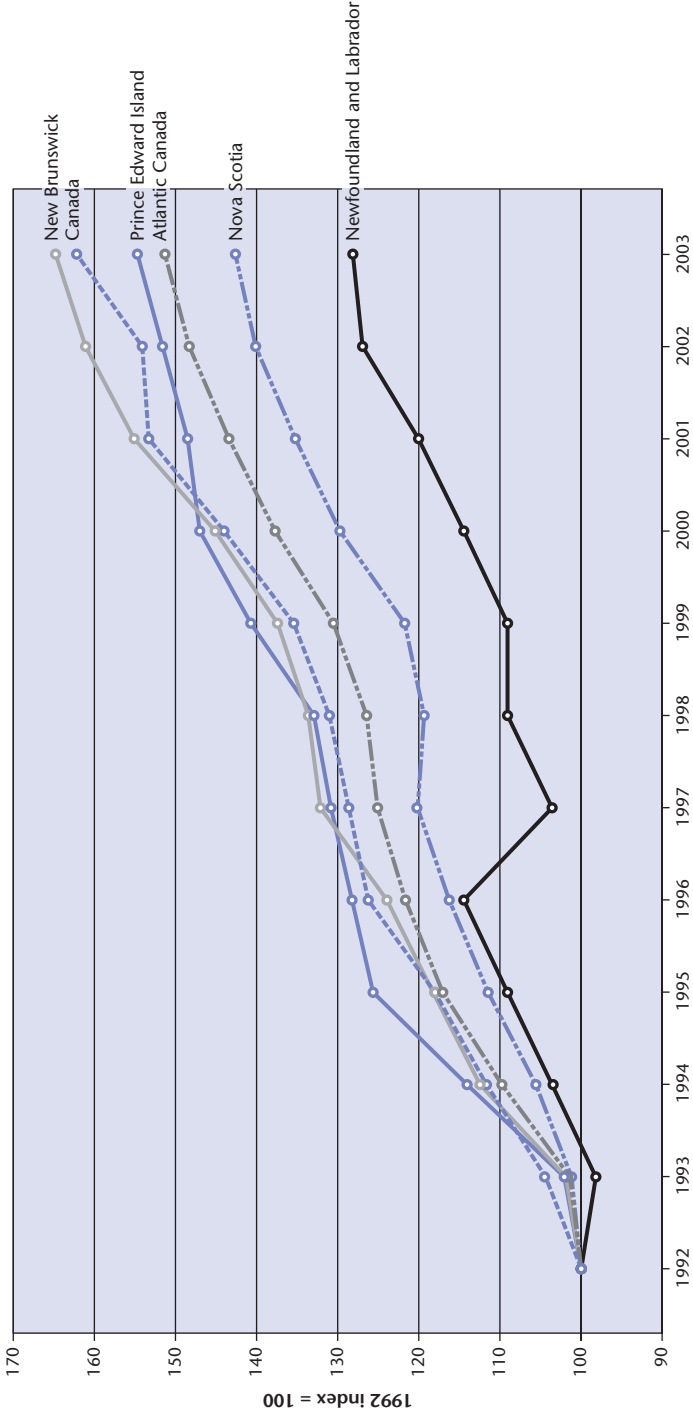
Figure 20 also shows that the increase in costs has been slower in the Atlantic region than in the country as a whole, except for New Brunswick, where expenses have exceeded the national average since 1997.

What is the explanation for this increase in costs of farming operations and other agricultural businesses? Table 8, which shows the distribution of expenditure items for farming operations for each of the Atlantic provinces, provides some insights. In 2001 four items (wages, animal feed, cattle and poultry purchases, and fertilizer and pesticides) accounted for 58 percent of farm-operating expenses in both Canada and Atlantic Canada. There are also differences among these four components. Thus, the Atlantic region pays out more for wages and animal feed purchases, whereas the country as a whole spends much more on cattle purchases. These differences reflect the structure of farms elsewhere in the country, in particular in the West, where cattle breeding combined with wheat and barley form the backbone of agriculture.

The share of costs varies according to the relative weight of the main expenditure items and the evolution of input prices. It should be pointed out that the price of inputs increased by 14 percent in Canada between 1995 and 1999, compared with 6 percent for the consumer price index (CPI).¹⁰⁰ Although electricity is not one of the main expenditure items, it can still have a considerable influence on the operators' profit margins. At least 10 percent of input costs can be attributed to expenditures on the electricity needed to operate equipment, heat and air-condition buildings and greenhouses, dry crops, etc. Moreover, the increase in electricity prices has affected inputs that are essential to agriculture, such as fertilizer, which is produced

100. According to the Canadian Federation of Agriculture, *A Road Map for Agriculture* (Ottawa: Canadian Federation of Agriculture, 2001).

Figure 20
Evolution of Farm-Operating Expenses by Province, Atlantic Canada, 1992–2003



Source: Statistics Canada, Agriculture Division, *Farm Cash Receipts, Farm Cash Expenses*, cat. no.21-011-XIF.

Table 8
Distribution of Main Expenditure Items for Farming Operations, by Province, Atlantic Canada, 2001

	Canada	Atlantic Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick
Wages (including by the job and contract)	14.1	20.2	20.2	17.0	22.2	21.0
Animal feed purchases	13.7	18.0	34.3	9.5	21.7	18.2
Cattle and poultry purchases	19.2	10.2	16.0	9.9	9.2	10.3
Fertilizer, lime, and pesticide purchases	10.9	9.8	2.4	18.1	5.4	8.7
Repair and maintenance (machine, equipment)	7.6	7.3	4.5	7.8	7.2	7.6
Interest charges	6.7	6.4	3.3	8.0	6.2	5.9
Fuel expenditures (diesel, oil)	5.7	5.1	4.6	4.9	5.3	5.1
Seed/plant purchases (excl. resale prod.)	3.5	4.3	1.8	6.2	2.7	4.9
Leasing fees (machine, material, equipment, lands, and buildings)	3.4	3.0	1.1	5.5	2.1	2.1
Electricity, telephone, and other telecommunication services	2.5	2.4	2.3	1.9	2.7	2.4
Veterinary services, medication, etc.	1.7	1.4	0.9	1.3	1.7	1.2
Other expenses (excluding for depreciation charges)	11.1	11.9	8.8	9.8	13.6	12.5
Total expenses	100.0	100.0	100.0	100.0	100.0	100.0

Source: Statistics Canada, Agriculture Division, Farm Operating Expenses and Depreciation Charges: Agriculture Economic Statistics, cat. no. 21-012-XIF.

from ammonia, a by-product of natural gas. The price of ammonia increased by 56 percent from 2000 to 2001.¹⁰¹

How does the increase in operating costs affect the financial performance of farming operations? As we have seen, farm receipts have increased in a similar way in the Atlantic provinces and Canada. In contrast, farm-operating costs in Canada have outpaced those in the Atlantic provinces, except, that is, in New Brunswick. As for the net profits of farming operations, they depend on both farm prices and operating costs. We have just seen that the latter expenses have increased greatly in all provinces, particularly owing to the cost of inputs and electricity. On the other hand, farm prices have also fluctuated considerably according to rising or falling price cycles. On average, during the entire 1992–2002 period, farm prices went up by 25.6 percent in Canada, higher than the CPI, which rose by 20.5 percent during this period. Figures 21 and 22 show these trends for the main types of crop and animal production.

Two observations can be made about the data in the preceding figures. First, farm prices increased much more rapidly than inflation until 1996, decreased to the CPI level in 1999, and then increased slightly again. Second, the curve of farm prices differs markedly depending on whether crop or animal production is involved. Crops mainly account for the wide variations in farm prices. Of the major commodities produced in Atlantic Canada, the price of potatoes, a premier crop in the region, is subject to the greatest variations, with pork not far behind. Lastly, the region's farm price for vegetables and poultry is well above the national average.

What is the situation in each of the Atlantic provinces? Figure 23 shows the aggregated trends of farm prices for all crop and animal products. From there we can see that the farm price for potatoes has a strong influence on the aggregated farm price index for Prince Edward Island and New Brunswick. These two provinces have benefited considerably from successive increases in potato prices, a situation that is reflected in the sector's expansion plans.

101. *Ibid.*, 5.

Figure 21

Evolution of Farm Price Index, Canada, 1992–2002

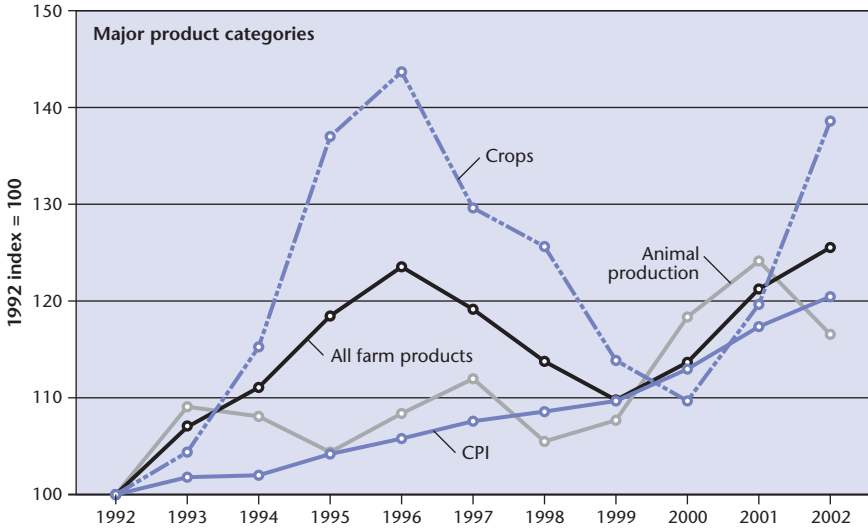
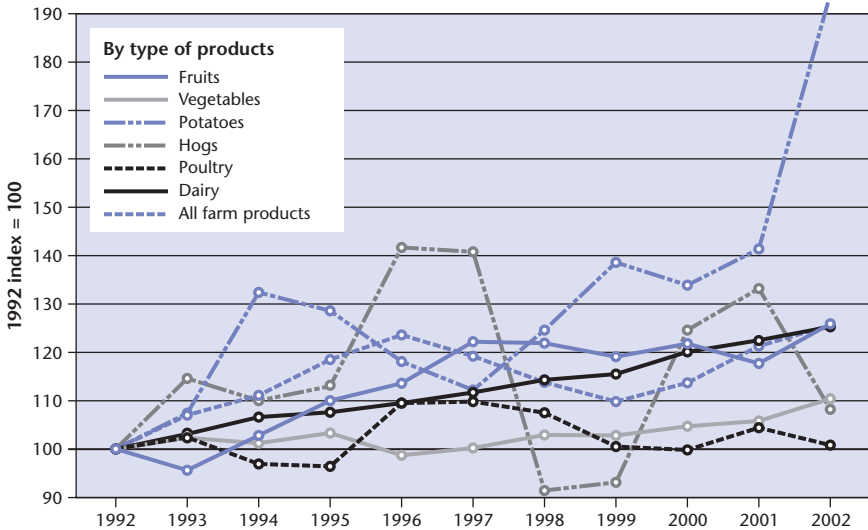


Figure 22

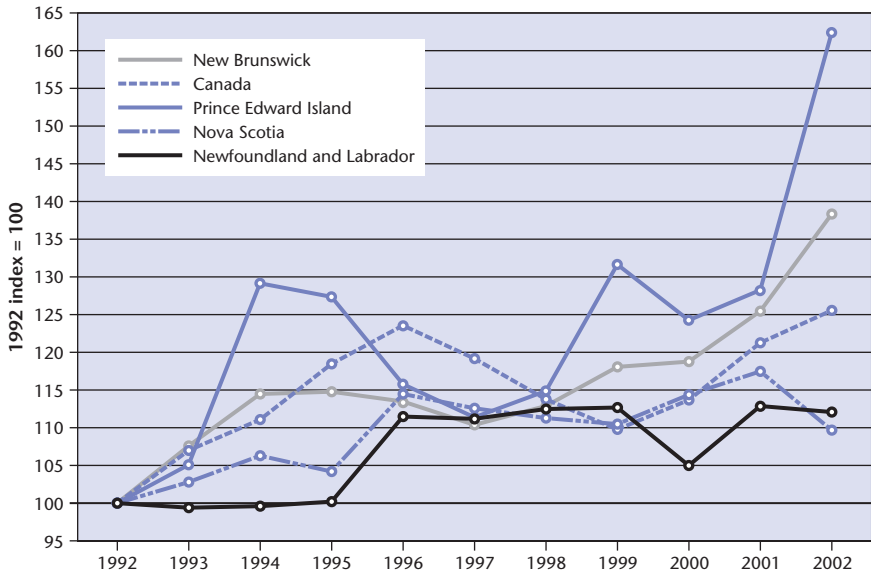
Evolution of Farm Price Index, by Type of Product, Canada, 1992–2002



Source: Statistics Canada, *Farm Cash Receipts: Agriculture Economic Statistics*, cat. no. 21-011-XIF.

Figure 23

Farm Price Index, by Province, Atlantic Canada, 1992–2002



Source: Statistics Canada, *Farm Cash Receipts: Agriculture Economic Statistics*, cat. no. 21-011-XIF.

A Highly Respectable Balance Sheet

We have just seen that farm-operating expenses are high everywhere in the country. In fact, they generally account for 84 percent (1992–2003 average) of total receipts, which leaves a 16 percent gross-operating margin. The operating margin is an important performance indicator. The profit or gross-operating margin is the receipts minus operating expenses related to farm receipts. Other performance indicators can also help to measure or compare the relative performance in agriculture. A few indicators for the recent period are presented in table 9 and figure 24.

Table 9
Agriculture Balance Sheet, by Province,
Atlantic Canada, 2001–3 (Average)

Indicator	Average Value (in \$ millions)						Atlantic Canada as a % of Canada
	Nfld. & Lab.	PEI	NS	NB	Atlantic Canada	Canada	
Crops	16.7	204.0	132.7	220.1	573.5	13,861	4.14
Cattle	65.9	123.3	272.4	203.9	665.5	18,611	3.58
Total market receipts	82.5	327.3	405.1	424.1	1,239.0	32,473	3.82
Program payments	0.9	31.7	13.9	7.5	54.1	3,653	1.48
Total cash receipts	83.4	359.1	419.0	431.6	1,293.1	36,125	3.58
Net operating expenses	68.6	289.7	351.2	333.6	1,043.3	28,178	3.70
Net cash income ^a	14.6	69.4	67.9	97.9	249.8	7,948	3.14
Total net income ^b	11.1	30.6	24.1	58.9	124.6	3,635	3.43
Ratio of operating margin ^c	0.17	0.12	0.13	0.21	0.16	0.13	
Net income as a % of total market receipts	13.5	9.6	6.2	14.5	10.4	12.0	

Sources: Statistics Canada, *Agriculture Economic Statistics*, cat. no. 21-603-XPF (for 2001); Agriculture and Agri-Food Canada, Forecast data for 2002 and 2003.

^a Net cash income is the difference between total farm receipts (including program payments) and operating expenses.

^b Total net income is net cash income adjusted for the value of inventory change, depreciation, and income in kind.

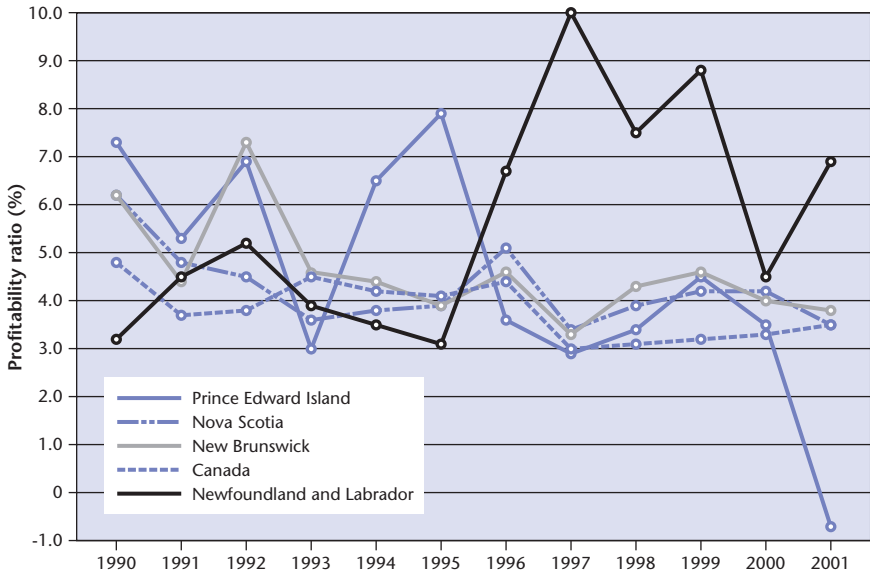
^c The ratio of operating margin is the ratio between the operating margin (market receipts minus operating costs) and farm receipts.

Table 9 shows that for the 2001–3 period, the gross operating margin was higher in the Atlantic provinces (16 percent) than in Canada (13 percent), with Newfoundland and New Brunswick showing higher returns. However, the net income ratio as a percentage of total market receipts was lower in Atlantic Canada (10.4 percent), although markedly higher in Newfoundland (13.5 percent) and New Brunswick (14.5 percent). Across Canada, the best returns in 2002, based on the operating margin, were in the following sectors: dairy farms (23.4 percent), grain and oilseed (23.9 percent), and potato production (19.3 percent). The hog industry (7.5 percent), poultry

industry (11.2 percent), beef industry (8.2 percent), and greenhouses (9.9 percent) generated markedly lower margins.¹⁰²

The relative performance of farms can also be measured by the profitability ratio, also called the return on assets. This is the ratio between net profits and average assets (see figure 24). Since the early 1990s, this ratio, with some minor variations, has shown a slightly better return in the Atlantic provinces. First, the ratio rose in Newfoundland and fell in Prince Edward Island, each case being subject to considerable fluctuations. New Brunswick and Nova Scotia follow closely behind the national average.

Figure 24
Profitability Ratio of Farms, by Province, Atlantic Canada, 1990–2001



Sources: Statistics Canada, *Agriculture Economic Statistics*, cat. no. 21-603-XPF (for 2001); Agriculture and Agri-Food Canada, Forecast data for 2002 and 2003.

102. Statistics Canada, "Farm Operating Revenues and Expenses, 2002: Final Estimates," *The Daily* (2 April 2004). Internet: <http://www.statcan.ca/Daily/English/040402/d040402b.htm>.

A Persistent Debt Level among Crop and Animal Producers

The performance indicators examined suggest that the financial situation of farming operations in Atlantic Canada is on the whole quite favourable. However, our examination would not be complete without taking their relative debt level into account. Thus, the Agriculture Division of Statistics Canada publishes an index, the *debt ratio*, which corresponds to the relationship between debt and assets (see figures 25 and 26).

In 2001 the debt (total liabilities) of farm operators in the Atlantic region represented 22 percent of their total assets — four percentage points higher than that of Canada. For the period 1990–2001 the debt ratio has always been a few percentage points higher in Atlantic Canada than in the country as a whole, but the gap has widened since 1994. It should be noted that the debt ratio value in Canada is usually quite close to that reported in the United States.

Within Atlantic Canada, the index values of the provinces are relatively similar, although in recent years the debt level has been higher in New Brunswick and Prince Edward Island. In Prince Edward Island, the relative debt increased from under 16 percent in 1991, a figure comparable to the Canadian average, to 23 percent in 2001.

In general, to obtain better returns, new capital investments must be made so as to increase productivity. This is what is happening in the entire agriculture and agri-food industry. In recent years, investments have been flooding into these sectors, with the result that the Atlantic region is in a good position compared with the country as a whole. In 2001 the total value of farm capital in the region passed the \$5 billion mark for the first time. Physical capital (lands and buildings) represented 72.7 percent of this amount, while machinery and equipment made up 19.6 percent and livestock 7.7 percent. In Canada, these proportions were 73.5 percent, 16.8 percent, and 9.6 percent respectively.

Figure 25

Debt Ratio of Farms, Canada vs. Atlantic Canada and United States, 1990–2001

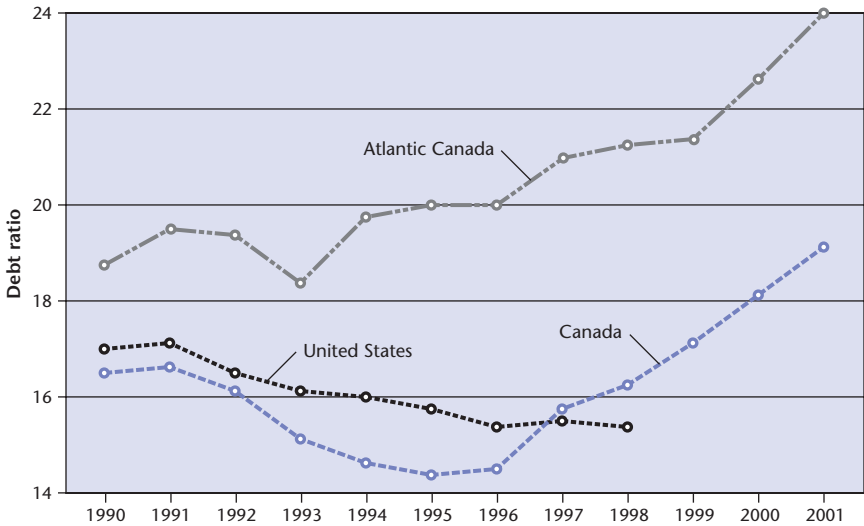
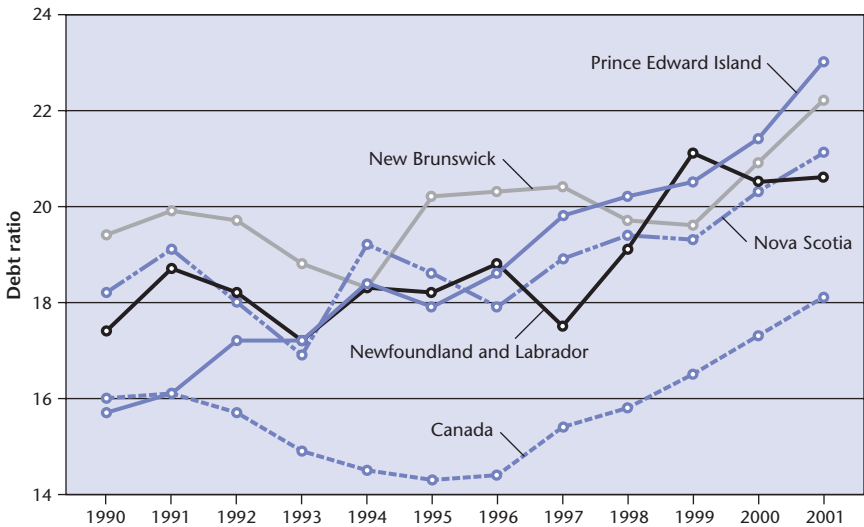


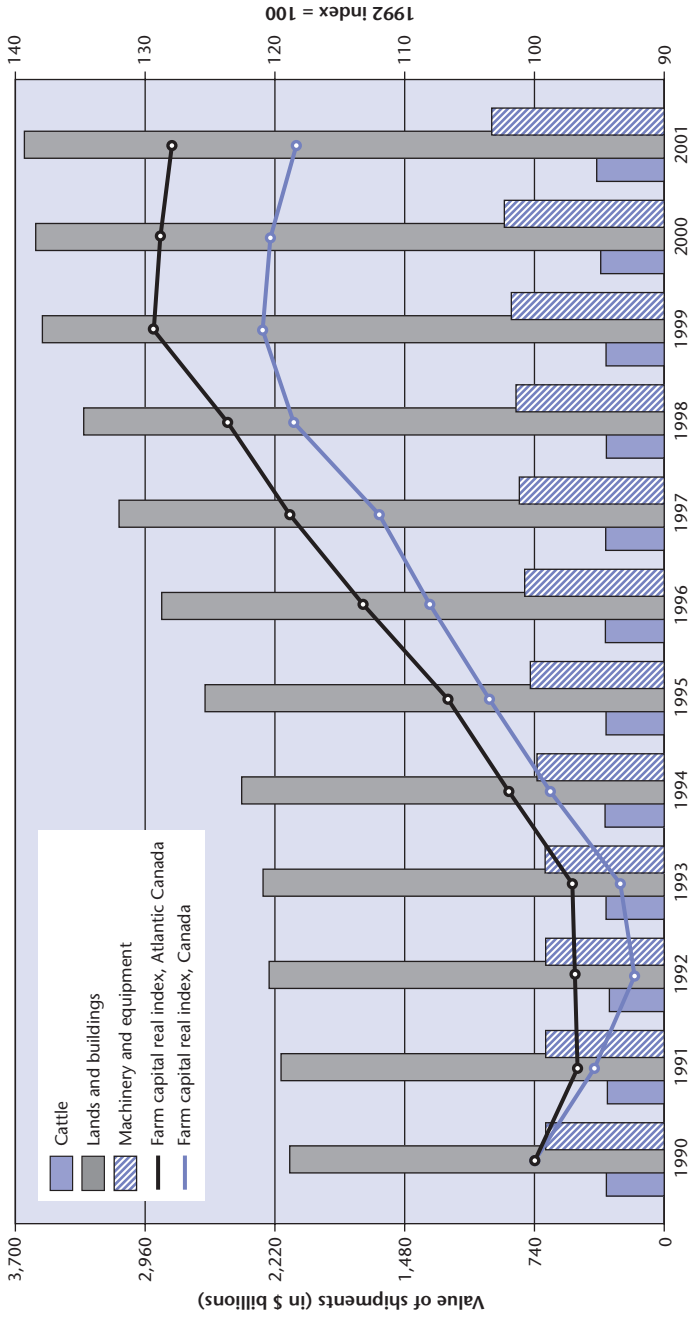
Figure 26

Debt Ratio of Farms by Province, Atlantic Canada, 1990–2001



Sources: Statistics Canada, Agriculture Division, *Balance Sheet of the Agriculture Sector: Agriculture Economic Statistics*, vol. 1, no. 2 (November 2002), cat. no. 21-016-X1F; Russell L. Lambe, *U.S. Agriculture at the Crossroads*, Kansas City, Federal Reserve Bank, Table 1, p. 76; <http://www.kc.frb.org/publicat/econrev/PDF/1q99lamb.pdf>.

Figure 27
Value of Farm Capital by Category, Atlantic Canada, 1990 and 2001

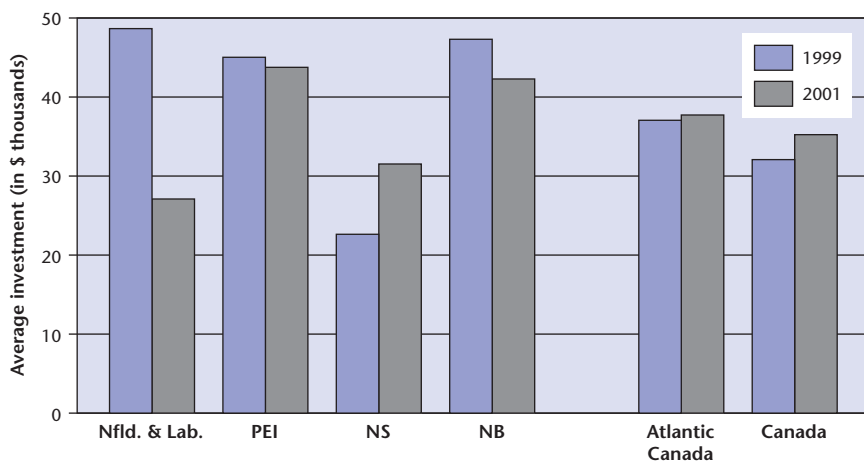


Source: Statistics Canada, Agriculture Division, Farm Cash Receipts: Agriculture Economic Statistics, cat. no. 21-011-XIF.

Figure 27 shows that the value of farm lands and buildings in Atlantic Canada has increased more rapidly than it has for the other components, in particular from 1994 onwards, a period that coincided with the country's economic recovery. Even when inflation is taken into account, the total value of farm capital increased by 31.8 per cent during the 1993–2001 period, compared with 26.8 per cent in Canada. This increase in the real value of farm capital in the region suggests that substantial investments were made, particularly during the second half of the 1990s.

This can be seen by comparing the average net investment made by each farm in the region with that made at the national level. Figure 28 thus shows that the average investment per farm rose to more than \$37,000 in the Atlantic provinces in 1999 and 2001, compared with \$32,000 and \$35,000 respectively in Canada as a whole.

Figure 28
Average Investment per Farm, by Province, Atlantic Canada,
1999 and 2001



Source: Agriculture and Agri-Food Canada, *Farm Income, Financial Conditions, and Government Assistance: Data Book* (March 2002), cat. no. A21-44/2002.

By expanding the potato sector, the investments that have been maintained in New Brunswick and Prince Edward Island have achieved the best averages in the country. Naturally, the investment level varies according to the type and size of operations. Ranking first are hog farms, which invested an average of \$108,000 in 2001, or three times the national average. For poultry farms the average investment was

\$64,000, which meant a return to more modest levels. Lower investment levels were noted for beef farms and grain growing.¹⁰³ In the case of potato production the average annual investment per farm reached \$91,000 (average for 1995, 1997, and 1999) and approximately \$52,000 for dairy farms and poultry farms — levels that are comparable to above the national average. It should be underlined that the average size of dairy farms in Atlantic Canada is about the same as the Canadian average (i.e., a fifty-cow herd). However, production capacities are larger in the Atlantic region in the potato sector (155 acres compared to 108 in Canada) and the poultry sector (8717 chickens versus 4764). As these three categories of farming operations represent slightly less than one-third of farms and nearly half of the region's farm receipts, their effect on all performance indicators is positive.

To sum up, the crop and animal production sectors in the Atlantic provinces have benefited from a very substantial level of capital investment — \$225 million per year — over the recent period. Capital was injected even though the entire sector was being consolidated. Although their size has not reached the national average, regional businesses are continuing to strengthen their bases and enhance their competitiveness, thus allowing them to adapt to major trends in the agri-food industry.

103. These data come from the *Farm Financial Survey: Data Book*. The survey was conducted by Statistics Canada and funded by Agriculture and Agri-Food Canada and includes a national sample of 20,000 farms with a gross income of \$10,000 or more. It has been conducted every two years since 1988.

Chapter 4

Sectoral Bases: Processing and Manufacturing of Agri-Food Products

Although crop and animal production constitutes the first link in the agri-food chain, the industry cannot progress without the presence of a dynamic sector downstream, one that is capable of innovating in the processing, manufacturing, and marketing of food products. As we have seen, the primary and secondary sectors of the region's agri-food industry are very closely linked, and as a result of these linkages, compared to elsewhere in Canada, a greater proportion of basic primary products is directed towards the processing-manufacturing sector. Moreover, the agri-food-processing industry in the Atlantic region is taking its role in innovation seriously. It has successfully modernized itself and has maintained a respectable performance both nationally and internationally. The industry continues to innovate and is gradually increasing its share of value-added products. The latter account for a considerable share of manufacturing shipments, which allow the region to increase its export ratio. These gains have led to new rounds of investments, which are likely to widen the range of value-added products and to enhance productivity and competitiveness.

The agri-food processing-manufacturing sector in Atlantic Canada is composed of no less than five hundred businesses, which, based on the 2001 census, directly employ fifteen thousand people (seventeen thousand if beverage production is included) and generate \$409 million in employment income (\$497 million if beverages are added). During the same year, the sector shipped approximately \$3 billion worth of products, 23 percent of which were exports to over eighty countries. The list of products is quite extensive (around two hundred) and includes, among other things, processed fruits and vegetables (mainly potatoes and wild blueberries), dairy products, meat and poultry, fruit juices, flour, snacks, confectioneries, bottled water, and beer.

These few basic data give a clear indication of the extent and vigour of the agri-food processing-manufacturing sector in the regional economy. Since 1990, the manufacturing output of agri-food products grew by 3.9 percent annually — at the same rate as the national level.

In contrast, the value added increased more rapidly in the Atlantic provinces, 4.5 percent on average per year compared with 3.5 percent in Canada. Thus in 2001 value-added output accounted for 38 percent of the value of agri-food manufacturing output in Atlantic Canada compared with only 28 percent in the country as a whole. It is estimated that the output of the food-processing sector in Canada will increase by 20 percent over the next five years, which corresponds to its growth rate in the 1990s.

■ Structure of the Processing Sector

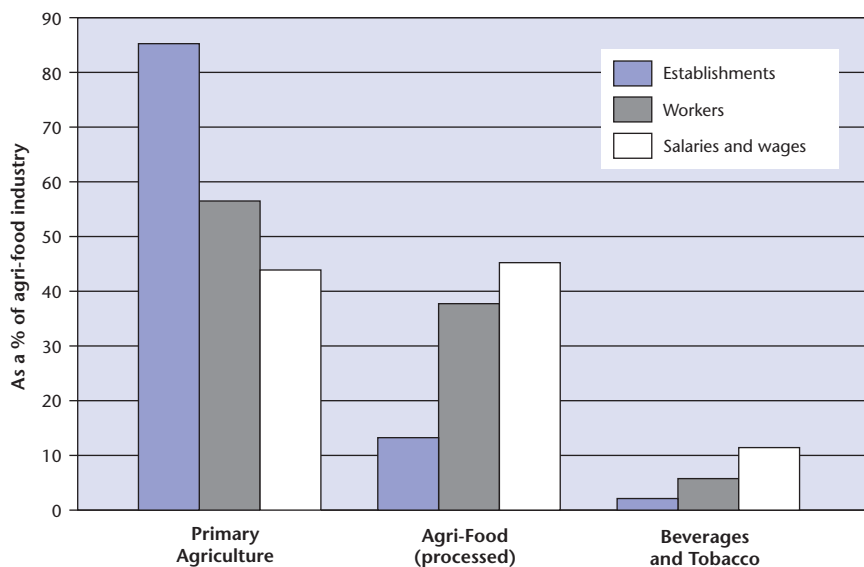
We have just seen that the Atlantic region has no fewer than five hundred businesses engaged in the processing and manufacturing of agri-food products. This figure is not accurate, however, since many businesses can be involved in different types of production, have no employees, or else operate several plants. For these reasons, it is always difficult to obtain the exact number of businesses in the sector, and the figures also vary according to source.¹⁰⁴

Before drawing up the profile of agri-food businesses in Atlantic Canada, we will determine their distribution and the place they occupy within the regional space. Figure 29 presents the regional structure of the two agri-food pillars — primary agriculture and agri-food processing. The latter sector also includes the production of beverages, which is incorporated in the analysis. The figure illustrates the relative importance of each of the major sectors according to the number of workers, the income they generate, and, of course, the number of businesses that make up the sector.

It can be seen that crop and animal production operations dominate the regional agri-food industry in both the number of businesses or operations and the number of workers. Although the processing-manufacturing sector appears to be smaller based on the number of businesses it has, it generates the greatest share of the industry's revenues. This confirms the strategic importance of the sector, whose multiplier effects on employment and income are markedly greater.

104. According to Statistics Canada's *Business Register*, there were 667 agri-food businesses in Atlantic Canada in 1999, including 521 with employees. In addition, there were 70 businesses engaged in the production of beverages (bottled water, soft drinks, and alcoholic drinks), including 57 with employees. For their part, the provincial directories report a total of 565 businesses. Lastly, based on the *Annual Survey of Manufactures*, there are approximately 300 agri-food businesses in the region, excluding the beverages segment; however, this survey only focuses on the largest.

Figure 29
Agri-Food Industry Structure by Major Sector,
Atlantic Canada, 1999



Source: Statistics Canada, *Annual Survey of Manufactures* (1999); compiled by the author.

Nor should the beverage sector be underestimated. It may have few businesses, but its share of wages is fairly considerable. Businesses in this sector maintain a high productivity level, and their wages are consequently high. In Atlantic Canada, the average income per job in the beverage sector is more than \$40,000 versus \$26,000 in all the agri-food-processing industries. The latter figure corresponds to about the average in the whole economy.¹⁰⁵

The Main Processing-Manufacturing Actors

There is no typical profile for businesses in the food-processing sector in Atlantic Canada. Indeed, quite the opposite is the case. Besides a few vertically integrated large businesses, well-established family businesses, and a few cooperatives firmly rooted in their communities, there is a wide range of businesses which differ according to size and status and which operate in the most varied areas. Moreover, it is difficult to determine the real status (ownership or control) of many businesses because of their numerous and subtly knit vertical and

105. Based on 2001 census data.

horizontal linkages. In fact, the general public is often unaware of the many commercial partnerships and takeovers. A great deal is heard about mergers and acquisitions among the major producers, manufacturers, or distributors, but the media show little interest in alliances or small-scale takeovers at the local or regional level. It is therefore relevant to focus more closely on these actors and to examine how the agri-food entrepreneurial fabric is structured in the region. We will begin by drawing up its statistical profile.

Based on the list in Statistics Canada's *2002 Business Register*, there are 568 agri-food-processing and manufacturing businesses in Atlantic Canada (see table 10). Adding another 67 businesses from the beverage sector which should be included in this number gives a total of 635 businesses. However, a quarter of these businesses have no employees.

The majority of businesses operate in the following sectors: bakeries, dairy products, meats, fruits and vegetables, and beverages. As well, there are other businesses whose contribution should not be overlooked, in particular those in the value-added sector, which supply an increasingly sophisticated local demand or have access to external markets in hitherto unsuspected market niches. Ethnic foods, pizzas, soups, traditional foods, specialty desserts, domestic wines, local cheeses, fruit juices, and salads are but a few examples of an extremely varied range of products which are either sold in the region's retail stores and farmers' markets or exported.

As is the case elsewhere in Canada, the bakeries sector, including flour mixes and dough manufacturing, is rapidly expanding in Atlantic Canada. New growth segments are emerging in this traditional sector, which has recently had great success on the export markets, in particular with pasta, cookies, and especially prepared meals. In total, exports of bakery-pastry products, pasta, and food preparations associated with these products (HS codes 1901, 1902, and 1905) more than doubled in Atlantic Canada between 1998 and 2002, increasing from \$33 million to \$72 million. New Brunswick accounts for two-thirds of these exports and Nova Scotia the remainder. The main export products are cookies and wafers (HS 190530 and 190532) as well as Melba toasts, toasts, and similar products (HS 190540).¹⁰⁶

106. Based on Industry Canada's STRATEGIS.

Table 10

Number of Agri-Food Businesses, by Sector and Province, Atlantic Canada, 2002

Manufacturing Sector (NAICS)	Total					Atlantic Canada	
	Nfld.	PEI	NS	NB	Total	Total	With Employees
311811 Retail bakeries	15	11	45	50	121	121	81
311814 Commercial bakeries and frozen bakery product manufacturing	11	2	31	31	75	75	56
311119 Other animal food manufacturing	2	8	22	22	54	54	49
311511 Fluid milk manufacturing	8	12	24	14	58	58	48
311420 Fruit and vegetable canning, pickling, and drying	6	5	13	13	34	34	22
311614 Rendering and meat processing from carcasses	6	2	16	9	33	33	21
311410 Frozen food manufacturing	1	5	6	10	22	22	20
311611 Animal (except poultry) slaughtering	6	2	8	4	20	20	18
311515 Butter, cheese, and dairy product manufacturing	1	5	6	7	19	19	14
311615 Poultry processing	4	2	5	2	13	13	11
311919 Other snack food manufacturing	1	3	3	3	10	10	10
311520 Ice cream and frozen dessert manufacturing	5	1	3	2	11	11	9
311330 Confectionery manufactured from purchased chocolate	2	2	4	6	14	14	8
311340 Nonchocolate confectionery manufacturing	1	0	3	2	6	6	5
311940 Seasoning and dressing manufacturing	2	0	3	2	7	7	5
311821 Cookie and cracker manufacturing	1	0	2	3	6	6	4
311822 Flour mixes and dough manufacturing from purchased flour	0	0	2	2	4	4	4
311823 Dry pasta manufacturing	1	0	3	0	4	4	4
311111 Dog and cat food manufacturing	0	0	5	0	5	5	3
311320 Chocolate and confectionery manufactured from cacao beans	2	1	1	1	5	5	3
311920 Coffee and tea manufacturing	0	1	2	2	5	5	3
311990 All other food manufacturing	8	1	11	22	42	42	26
All agri-food businesses	83	63	218	207	568	568	424
312110 Soft drink and ice manufacturing	6	1	15	10	32	32	24
312120 Breweries	5	0	7	3	15	15	11
312130 and 312140 Wineries and distilleries	3	1	10	6	20	20	18
Beverage businesses	14	2	32	19	67	67	53

Source: June 2002 establ. counts by prov./CD, nat. industries and empl. size ranges.

On the whole, this traditional field is still strongly modeled on the tastes and customs of the region. Among the main producer-manufacturers are Eastern Bakeries and Ben's Limited, which both specialize in bakery products and are present in several Maritime centres and in St. John's, and Mother's Own Bakery in Moncton; Sarsfield Foods in Kentville, Nova Scotia, a company specializing in pastry; and Grand Falls Central Bakery in northwest New Brunswick. Retail bakeries are distinguished from commercial bakeries, which incorporate a number of manufacturing productions. Several of them export a substantial share of their products. Among these companies are Atlantic Waffles, Bonté Foods, Fancy Pokket Corporation, the Pizza Delight Corporation, and Ocean Pier in the Moncton region, companies offering a wide range of products (doughnuts, bagels, chowders, appetizers, lasagnes, pita breads, pizza crusts, pizzas, etc.); G. E. Barbour Inc. in Sussex (spices, peanut butter); and Fine Food Investments of Charlottetown (frozen pizzas). Several of these bakeries are now under the control of Canada Bread, a Canadian multinational company based in Ontario.

The meat and poultry sector is also well represented by some sixty operators, some of which are relatively large. Among these are Hub Meat Packers (Moncton), a processing plant that was acquired by Larsens Packers (Berwick, NS), which is itself controlled by Maple Leaf Canada; Poultry Company and Eastern Protein Foods (Kentville); ACA Co-Operative (New Minas); Nadeau Farms (Madawaska), controlled by Maple Lodge; IPL Processing (St. John's); O. H. Armstrong Ltd. (Kingston, NS); and Garden Province Meats (Charlottetown).

The dairy product sector is represented by some fifty operators in Atlantic Canada, the main ones being the Farmers Co-Operative Dairy in Nova Scotia and the Northumberland Co-operative (Miramichi); Baxter Foods (Saint John and Dartmouth), now in the hands of Saputo (Montreal); Central Dairies (St. John's); Amalgamated Dairies (Charlottetown and Summerside); Scotsburn Dairy Group (Nova Scotia); and Dairytown Products (Sussex).

Over sixty businesses in the region specialize in fruit and vegetable processing and canning, the majority in potato processing. Among this number are the giant McCain Foods (Florenceville, NB) and Cavendish Farms (Dieppe, NB), the latter owned by the powerful Irving group. These two companies operate at least seven processing plants in New Brunswick and Prince Edward Island as well as many facilities worldwide. Regional producers should also be men-

tioned: for example, Asapco Foods (Woodstock, NB), Canusa Foods (Centreville, NB), Ferme Michaud (Saint-André, NB), and Mid-Isle Farms (Kinkora, PEI). Several companies operate in sectors other than the potato sector, in particular horticultural products. This is true of Money's Mushrooms (Freetown, PEI) and Island Bean (Montague, PEI). In the small fruits sector, Oxford Frozen Foods (Oxford, NS) largely dominates, particularly since it acquired the assets of Mega-Blue (Tracadie-Sheila, NB). Canning is operated mainly by Avon Foods Inc. (Berwick, NS).

Lastly, two other sectors, although they involve a small number of businesses, are also important to some regions — confectioneries and snack foods as well as beverages. The former are represented by potato chip producers Humpty Dumpty Snack Foods (Summerside), Humpty Dumpty Foods Ltd. (Hartland, NB), and Hostess Frito-Lay (Kentville) and by chocolate manufacturers Ganong Brothers (St. Stephen, NB), and Moirs Plant (Dartmouth), a subsidiary of Hershey Foods Corporation in Mississauga.

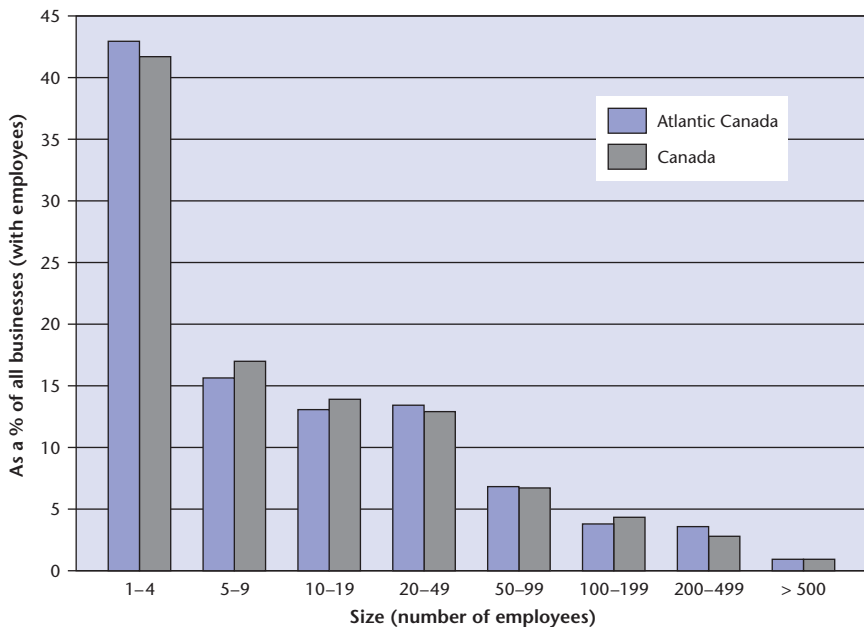
This list is certainly far from complete. There are also a large number of businesses that operate on different scales in specific market niches, but they often trail behind the large producers, which purchase their supplies as much as possible in the region.

In considering the beverage sector, the following manufacturers come to mind: beer producers Moosehead Brewery (Saint John), Oland Brewery (Halifax), and Molson Brewery (St. John's) and soft drink producers Pepsi Bottling Group (Moncton), Browning Harvey Ltd. (St. John's), and Cott Beverages Canada (Scoudouc, NB). In recent years, a number of small- and medium-sized businesses specializing in market niches such as home brewing and wineries have emerged in this sector. These new businesses have little impact on the profile of the entire sector, but they are sufficiently numerous to broaden the industry's image beyond beer and soft drink production.

It should be pointed out that among the region's agri-food businesses are several producers that are involved in the manufacture of industrial by-products such as animal feed, fertilizers, and seeds. These productions are far from insignificant since their exports amount to a total of between \$10 million and \$15 million in the Atlantic region. This amount does not include canola or especially seed potatoes, two products for which New Brunswick and Prince Edward Island have gained international recognition.

Although the provinces' agri-food businesses are relatively diversified in structure, most are fairly small in size. Among those that are employers, 58.5 percent have fewer than ten employees (see figure 30). This proportion of very small businesses is not unusual in Atlantic Canada since three out of four businesses in the whole economy belong to this category. Nor is the situation unique to the region since a similar proportion (58.7 percent) of agri-food businesses in Canada have fewer than ten employees.¹⁰⁷ In the United States, according to the United States Department of Agriculture (USDA), the overwhelming majority (96 percent) of food-processing companies are considered to be small-sized (fewer than one hundred employees). (Those with one hundred employees or more are responsible for 80 percent of the value added generated by the processing sector.) It must be said, however, that with the trend towards consolidation, the decreasing number of SMBs is leading to a decline in their relative share of production.

Figure 30
Distribution of Agri-Food Businesses by Size,
Canada vs. Atlantic Canada, 2002



Source: Statistics Canada, *Business Register* (2002); compiled by the author.

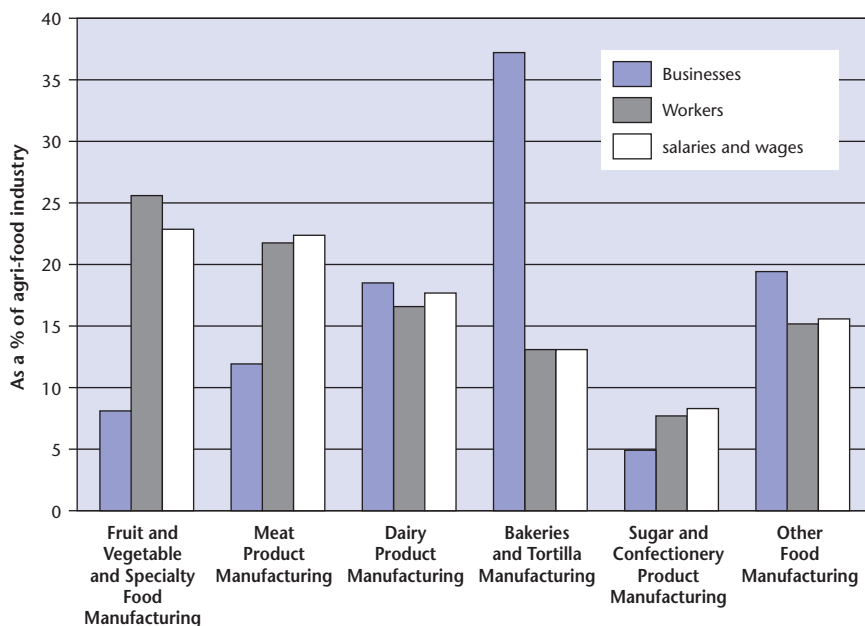
107. Based on Statistics Canada's *Business Register* (June 2002).

There is a general trend towards enlarging the scale of operations in the entire agri-food system. Although the average size of establishments is growing, the number of small specialized businesses aimed at specific market niches is also increasing. However, because they lack economies of scale, it is especially difficult for them to penetrate other markets. Especially troublesome is the number of problems resulting from high transportation and distribution costs. As well, they must accept changes in the distribution chain (consolidation and grouping of food retailers). And lastly they must face the competition from large Canadian businesses and multinational companies while ensuring an adequate supply of raw materials and guaranteeing standardized products.

The Relative Influence of the Main Sectors

The number of businesses in a given sector does not necessarily reflect the value or relative importance of this sector. For example, although bakeries dominate in number, accounting for 37 percent of agri-food businesses, they provide only 13 percent of jobs and a similar share of revenue generated by the industry (see figure 31).

Figure 31
Structure of the Agri-Food Industry by Main Sector,
Atlantic Canada, 1999



Source: Statistics Canada, *Annual Survey of Manufactures, 1999*; compiled by the author.

These differences cannot be attributed to the relative size of businesses, but rather to their type of products or activities. In fact they result from a combination of factors that affect business performance. The main performance indicators relate to the value of manufacturing shipments per worker, the value added, and of course the gross profit margin of the business. These various indicators are generally interrelated and largely determine the productivity level of businesses and ultimately the average wage (or average income) of their workers. These performance indicators for the industry as a whole and for the main agri-food sectors will be examined later.

Figure 31 shows the relative influence of the six major groups of agri-food industries in Atlantic Canada. It shows, in absolute numbers, the average income by agri-food sector in each of the Atlantic provinces and to what extent it differs from corresponding incomes in the country and the economy as a whole. Table 11 shows that the average wages in the agri-food industry are comparable to those of the entire economy, regardless of the targeted province. As well, it reveals that the employment income derived from agri-food activities is lower in Newfoundland and Labrador than in the Maritimes, where it is about 85 percent of the national average.

Another useful comparison concerns the income differential between the sectors. It shows the surprising domination of beverage manufacturing in all regions. Moreover, this sector's income level in the Atlantic provinces comes very close to the national average. This is not the case in Prince Edward Island, however, where the absence of breweries undoubtedly accounts for the lower income level in this sector. The bakeries sector, which has a particularly high number of businesses, does not seem to offer attractive incomes, except perhaps in Nova Scotia. The higher concentration of businesses in the regional metropolis of Halifax may have a positive impact on productivity in this sector by promoting economies of scale in both production and distribution.

Table 11
Average Income in the Agri-Food Industry Based on Main Sectors, by Province, Atlantic Canada, 2001

	Canada	Atlantic Canada	Newfoundland & Labrador	Prince Edward Island	Nova Scotia	New Brunswick
Average employment income (\$)						
All industries	33,447	26,859	26,033	23,697	28,107	26,497
Agri-food	30,876	26,094	22,970	26,662	27,521	25,434
3114 Fruit and vegetable preserving and specialty food products	31,891	24,521	15,218	26,949	19,108	25,140
3115 Dairy product manufacturing	36,020	28,368	25,248	29,848	30,533	26,174
3116 Meat product manufacturing	28,246	25,647	20,351	24,677	26,740	26,046
3118 Bakeries and tortilla manufacturing	25,162	21,931	19,912	14,510	24,404	21,659
3121 Beverage manufacturing	42,435	40,238	39,836	34,309	40,680	40,837
Index: Canada = 100 for each industry						
All industries	100.0	80.3	77.8	70.8	84.0	79.2
Agri-food	100.0	84.5	74.4	86.4	89.1	82.4
3114 Fruit and vegetable preserving and specialty food products	100.0	76.9	47.7	84.5	59.9	78.8
3115 Dairy product manufacturing	100.0	78.8	70.1	82.9	84.8	72.7
3116 Meat product manufacturing	100.0	90.8	72.0	87.4	94.7	92.2
3118 Bakeries and tortilla manufacturing	100.0	87.2	79.1	57.7	97.0	86.1
3121 Beverage manufacturing	100.0	94.8	93.9	80.9	95.9	96.2
Index: Canada = 100 for economy as a whole						
All industries	100.0	100.0	100.0	100.0	100.0	100.0
Agri-food	92.3	97.2	88.2	112.5	97.9	96.0
3114 Fruit and vegetable preserving and specialty food products	95.3	91.3	58.5	113.7	68.0	94.9
3115 Dairy product manufacturing	107.7	105.6	97.0	126.0	108.6	98.8
3116 Meat product manufacturing	84.5	95.5	78.2	104.1	95.1	98.3
3118 Bakeries and tortilla manufacturing	75.2	81.7	76.5	61.2	86.8	81.7
3121 Beverage manufacturing	126.9	149.8	153.0	144.8	144.7	154.1

Source: Statistics Canada, 2001 census; compiled by the author.

For its part, the meat sector is being intensely consolidated and is subject to control by outside interests, at least as regards beef. This sector managed to increase its productivity level not only through essential economies of scale but also by employing leading-edge technologies; at the same time it maintained a large labour force. Its levels of employment income are about average, except in Newfoundland and particularly Prince Edward Island. The future construction of a cattle slaughterhouse on the Island will undoubtedly have a significant impact on the overall performance of this sector in the province.¹⁰⁸

Lastly, the relatively good performance of the dairy product sector should be noted. This diversified sector is based mainly on the production of fluid milk and industrial milk, but it also produces specialty products (cheeses, yogurts) and ice cream. Its levels of employment income are generally comparable to or above the average in the economy. Incomes are particularly high in Nova Scotia and Prince Edward Island. On the whole, this sector displays a better balance than the other agri-food sectors in the ratio between its number of establishments, share of jobs, and share of employment income generated.

■ Performance of the Processing-Manufacturing Sector

We have just seen how extensive the agri-food field is and noted the importance of the linkages with the processing-manufacturing businesses upstream and downstream. We also know that each of the segments that make up this entire industry have their own characteristics, evolve at their own pace, and offer different short- and long-term prospects. Thus, it remains for us to assess more accurately the level of performance, or the profitability, of these sectors since their stability and progress depend on these indicators.

How can the performance of such a heterogeneous industry be measured? According to Statistics Canada researchers, “The relative profitability of industries, such as the relative performance of businesses, can be measured by combining quantitative and profitability ratios. Some ratios relate to the financial analysis and the profitability”¹⁰⁹ of the sector. In the following section, we will define

108. “Coop Atlantique will build its slaughterhouse in the Borden-Carleton region” (translation), *L’Acadie Nouvelle* (12 November 2002).

109. Industry Canada’s STRATEGIS, *Canadian Industry Statistics*.

the relative importance and the performance of the industry's sectors and subsectors.¹¹⁰ It should be specified that it is not our intention to conduct a detailed analysis of the eight major agri-food sectors in each of the four Atlantic provinces. Instead, we must restrict ourselves to a number of indexes or ratios relating to the performance of the entire sector in order to determine the industry's real capacity for adaptation.

Agri-Food Production

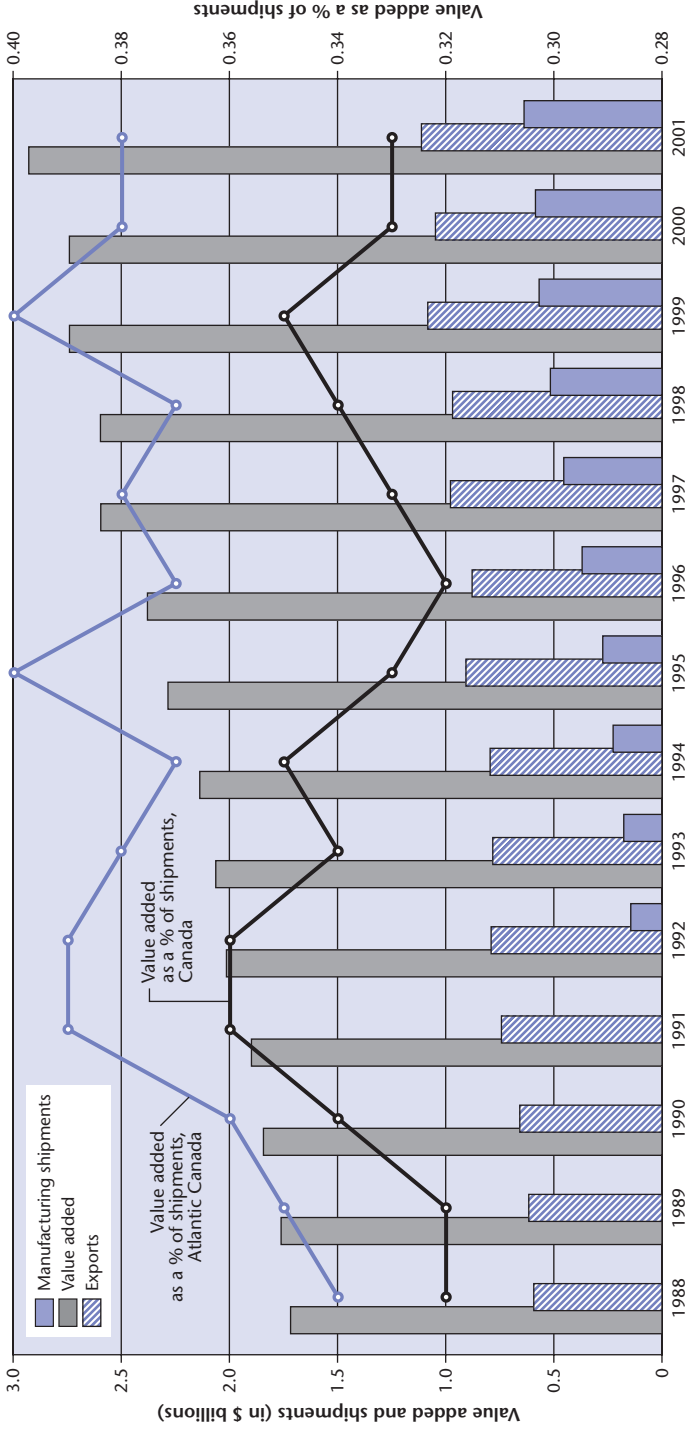
We will now examine the evolution of the agri-food industry. Figure 32 shows the evolution of manufacturing shipments, value added, and exports of agri-food products processed or manufactured in Atlantic Canada for the period 1985–2001. It can be seen that both the main production activities as well as exports are increasing. Another positive feature of the agri-food industry in Atlantic Canada is that the ratio of value added as a percentage of shipments is above the national average; the region's lead over the country as a whole has increased in recent years.

We are particularly interested in the years 1992 to 2001 because the available data for this period are more detailed and because major changes have occurred since the recession in the early 1990s. Examining table 12, we find that the selected growth indicators that have been compiled provide useful information. First, the production level, measured here by the value of shipments, increased at an average annual rate of 3.8 percent in Atlantic Canada during this period, that is, at a slightly slower rate than the national level (4.5 percent). On the other hand, the value added, which provides a more precise measure of output,¹¹¹ increased at more or less the same rate in the Atlantic provinces as in the country as a whole.

110. This involves showing the evolution of agri-food production in the region based on shipments, value added, number of jobs, wages, and other production costs. Statistics Canada's *Annual Survey of Manufactures* is used as the main database, but other sources (for example, the census), can provide additional data.

111. According to Statistics Canada, *value added* is a measure of net output; i.e., it is equal to gross output minus input costs (raw materials, equipment, energy) incorporated in the product's value. It provides some indication of the level of processing taking place in an industry or business.

Figure 32
Selected Indicators for Agri-Food Production, Atlantic Canada, 1988–2001



Sources: Statistics Canada, *Annual Survey of Manufactures*; Industry Canada, STRATEGIS (export data). Compiled by the author.

Table 12
Evolution of the Agri-Food Sector in Canada and the Atlantic Provinces, 1992–2001

Year	Number of Establishments	Number of Workers	Number of Hours Worked ('000)	Wages (\$'000)	Cost of Raw Materials (\$'000)	Value of Shipments (\$'000)	Value Added (\$'000)
Canada							
1992	2,633	124,525	257,988	3,536,708	22,841,473	36,841,311	13,423,721
1993	2,570	124,539	256,700	3,558,566	24,324,467	38,079,941	13,115,266
1994	2,540	126,178	259,617	3,631,878	25,775,874	40,183,667	13,893,447
1995	2,558	127,749	262,828	3,751,480	27,668,620	42,203,264	13,924,408
1996	2,710	134,480	276,096	3,919,759	30,362,551	45,301,713	14,389,928
1997	2,609	138,108	280,060	4,045,454	31,489,752	47,627,317	15,549,732
1998	3,235	134,507	272,236	3,972,069	31,404,693	48,447,724	16,400,157
1999	3,076	146,467	296,899	4,322,320	31,979,468	49,530,486	17,322,888
2000	4,825 ^a	165,740	n.a.	4,610,428	35,048,662	53,348,969	17,463,034
2001	4,845 ^a	168,623	n.a.	4,852,652	37,690,458	57,384,734	18,669,837
Avg. ann. var., 1992–2001 (%)	2.0	3.1	1.8	3.2	5.1	4.5	3.4
Atlantic provinces							
1992	162	8,032	16,964	192,378	1,181,591	2,015,066	791,324
1993	157	7,851	16,317	188,582	1,243,394	2,062,073	782,446
1994	155	8,116	16,492	193,771	1,305,065	2,138,707	795,232
1995	163	9,384	18,922	220,970	1,329,330	2,284,117	906,520
1996	175	9,247	19,109	233,660	1,468,279	2,380,610	880,340
1997	165	10,161	20,556	248,868	1,550,820	2,591,909	980,863
1998	212	9,888	19,679	244,894	1,578,168	2,595,424	968,969
1999	200	10,752	21,247	267,050	1,599,994	2,739,573	1,084,563
2000	293 ^a	11,255	n.a.	264,975	1,647,412	2,739,974	1,050,154
2001	298 ^a	12,023	n.a.	272,373	1,728,235	2,927,598	1,114,404
Avg. ann. var., 1992–2001 (%)	2.7	4.1	2.9	3.5	3.9	3.8	3.5

Source: Statistics Canada, *Annual Survey of Manufactures*; compiled by the author.

^a Changes in the survey methodology in 2000 and 2001 particularly affected the number of establishments and the hours worked; these years were not taken into account when calculating the average annual variation of these two factors.

This shows that the agri-food industry in the region has gone some way in catching up to the country as a whole. Other indicators show similar results, in particular the increase in the number of hours worked, aggregated wages, and intensity of exports. This last point will be examined in detail in the next chapter. We will also examine the factors that explain this relative performance.

New Brunswick and Nova Scotia are the region's leaders in shipments. In fact, Nova Scotia has even worked its way up to first place in the region in recent years (see figure 33).

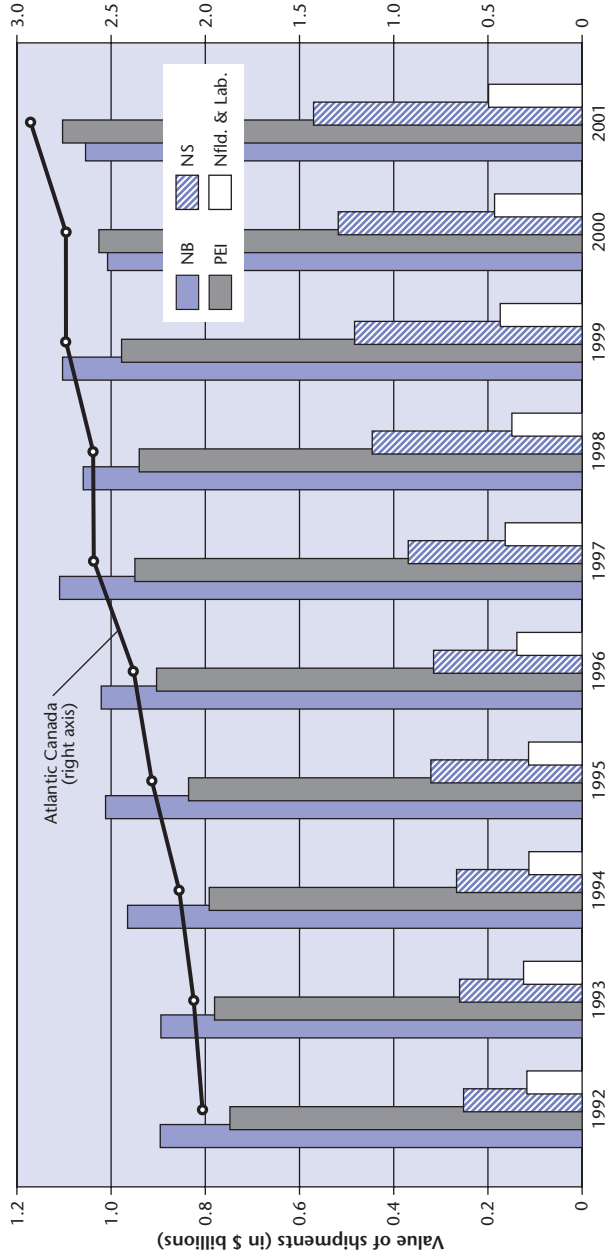
However, Prince Edward Island recorded the best gains, both in shipments (average annual increase of 8.5 percent during the period) and value added (average annual growth of 10.2 percent). At the regional level, the ratio of value added to production is 38.2 percent, which is markedly higher than the national average of 33.6 percent for the same period (see table 13). This high ratio results from, among other things, the considerable increase in the number of processed products in the potato sector in Prince Edward Island and New Brunswick.

Table 13
Average Annual Growth of Shipments
and Value Added in Agri-Food Processing,
by Province, Atlantic Canada, 1992–2001

	Average Annual Growth, 1992–2001 (%)		Value Added as a % of Shipments (1992–2001 average)
	Shipments	Value Added	
Canada	4.5	3.4	33.6
Atlantic Canada	3.8	3.5	38.2
Newfoundland and Labrador	5.4	3.9	36.2
Prince Edward Island	8.5	10.2	37.3
Nova Scotia	4.0	1.6	36.5
New Brunswick	1.6	2.3	40.4

Source: Statistics Canada, *Annual Survey of Manufactures*; compiled by the author.

Figure 33
Value of Manufacturing Agri-Food Shipments, by Province, Atlantic Canada, 1992–2001



Source: Statistics Canada, *Annual Survey of Manufactures*; compiled by the author.

The data presented above attest to a vigorous expansion of the agri-food-processing sector in Atlantic Canada over the last decade. Analyses also show that this expansion is due to a greater development of basic products. Based on these general indicators, we can conclude that on the whole, the industry has enhanced its competitiveness and probably its profitability, as will be demonstrated below.

Return and Profitability

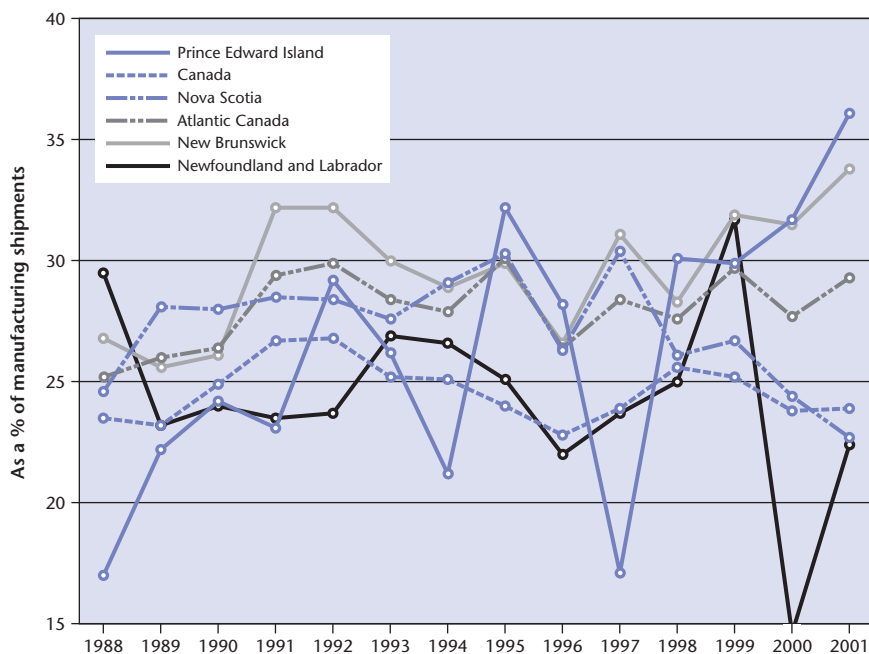
To accurately assess the performance of the agri-food processing-manufacturing sector, we will use at least two indicators — productivity and return, or profitability. The trends for each of these indicators are presented in the following figures. As regards return, it can be seen that the agri-food-processing industry in Atlantic Canada managed to maintain a gross profit ratio¹¹² of 28 to 30 percent throughout the 1990s. This indicates a good performance, especially given the profound changes which shook the region's manufacturing base and in particular the margins obtained elsewhere in Canada, where the gross profit margin in the agri-food-processing sector decreased slightly in recent years. This makes the Atlantic region stand out even more from the national average (see figure 34).

Prince Edward Island and New Brunswick are the leaders in gross profit margin, a trend that has intensified in recent years. There is no doubt that the expansion of the potato-processing industry plays a large part in this. Statistics Canada's analyses of the performance of the various agri-food sectors show that the frozen-fruit and vegetable-processing sector and the dairy product sector have the highest profit margins.¹¹³

112. This ratio is calculated as follows: [(value of shipments – production costs) / value of shipments] X 100. Shipments and production costs only apply to the manufacturing production sector.

113. Based on these analyses, the net profit margin of establishments with profits of less than \$5 million is higher for frozen fruits and vegetables (SIC 1032) and dairy products (SIC 5213). Both these sectors (it should be mentioned that large-processing businesses are excluded) had in 1999 net margins of 4.42 percent and 2.03 percent respectively, compared with 0.95 percent for the meat-processing sector, for example. See Statistics Canada, *Financial Performance Indicators for Canadian Business*, vols. 2–3 (Ottawa, 2003); cat. no. 61F0059XCB.

Figure 34
Gross Profit Margin in Agri-Food Processing, by Province,
Atlantic Canada, 1988–2001



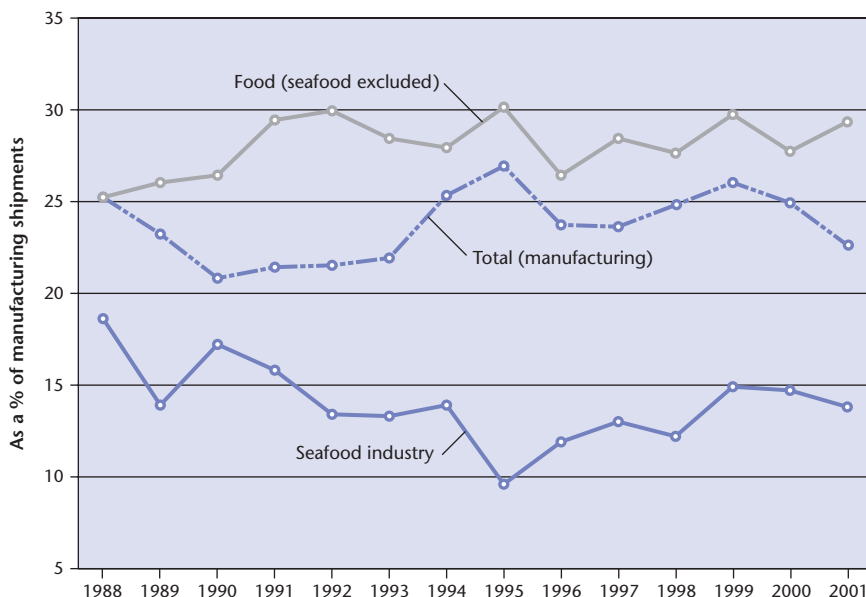
Source: Statistics Canada, *Annual Survey of Manufactures*; compiled by the author.

Note: Seafood is excluded.

A similar analysis at the sectoral level confirms the enviable position of the region's agri-food sector. Figure 35 shows that this sector is ahead of the manufacturing sector as a whole for the entire period of 1988–2001. Another remarkable fact is that the gross profit margin for agri-food processing is markedly higher than that reported for the fish- and seafood-processing industry. This performance indicator clearly demonstrates that the agri-food sector cannot be combined with the food sector in general, as is the case elsewhere in the country. There is a world of difference between these two major food sectors in the Atlantic provinces.

Figure 35

Gross Profit Margin in Agri-Food Processing Compared with Other Industries, by Province, Atlantic Canada, 1988–2001



Source: Statistics Canada, *Annual Survey of Manufactures*; compiled by the author.

The profitability of an industry depends on several factors. Besides the variations in sale prices, it generally results from a more efficient use of production factors, a drop in production costs, or a combination of the two. What is the situation for the agri-food sector?

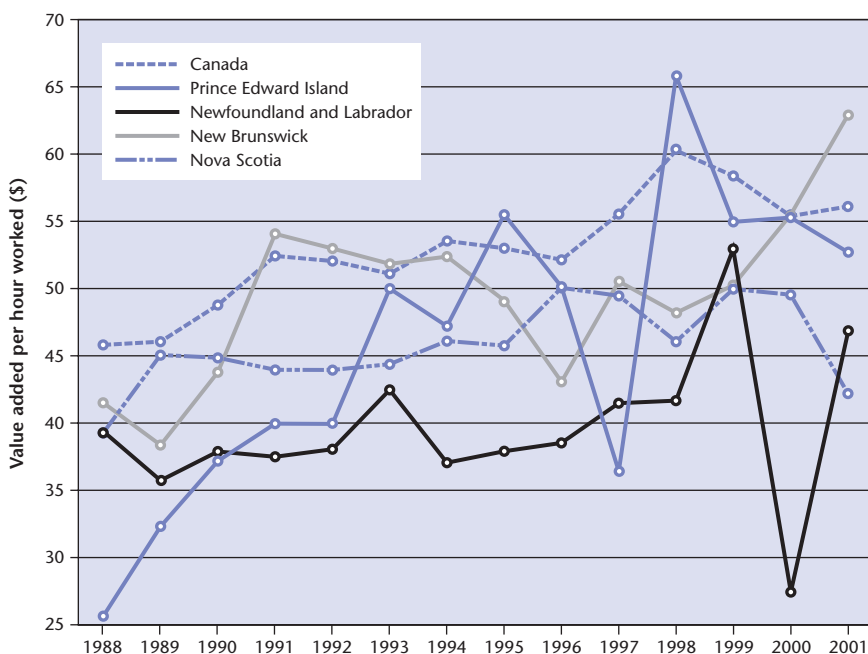
Productivity in the Atlantic region generally lags behind the rate in other regions of the country. This lag is attributed to several factors, including the smaller size of businesses, more seasonal employment, the structure of the manufacturing industry, which is more centred on the primary or secondary processing of natural resources, and the low level of research and development.¹¹⁴ On this last point, it is noted that while the region has 8 percent of the Canadian population, only 3.44 percent of research and development expenditures (all sources combined) in the country in 1997 were made in the Atlantic

114. Several studies and analyses demonstrate the restricting effects of these structural factors on the productivity and the capacity for adaptation of the region's industries. See, for example, Yves Bourgeois and Samuel LeBlanc, *Innovation in Atlantic Canada*, Maritime Series (Moncton: The Canadian Institute for Research on Regional Development, 2002).

provinces. Moreover, this percentage has decreased since 1988 when it was 5.24 percent. Furthermore, the proportion of R & D expenditures granted by the private sector is markedly lower in the Atlantic provinces (20 to 25 percent) than in Canada (45 to 50 percent).¹¹⁵

Our analyses reveal that the productivity of Atlantic Canada's agri-food-processing industry has shown mixed results. Examination of the hourly productivity (value added per hour worked) shows that the region is in a worse position than the country as a whole, although the gaps narrowed during the 1990s (see figure 36). In contrast, the industry's productivity compares favourably with that of the other manufacturing sectors in the region, in particular fish and seafood processing (see figure 37).

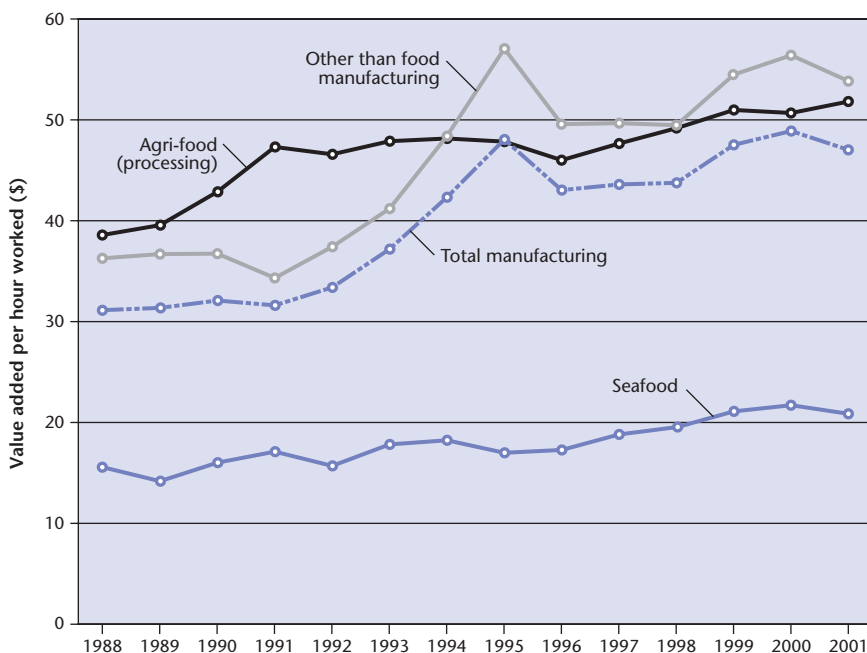
Figure 36
Agri-Food-Processing Productivity, by Province,
Atlantic Canada, 1988–2001



Source: Statistics Canada, *Annual Survey of Manufactures*; compiled by the author.

115. See Statistics Canada, *Estimates of Canadian Research and Development Expenditures* (Ottawa: Statistics Canada, 1999); cat. no. 88F0006XPB, no. 8.

Figure 37
Agri-Food-Processing Productivity Compared with Other Sectors,
Atlantic Canada, 1988–2001



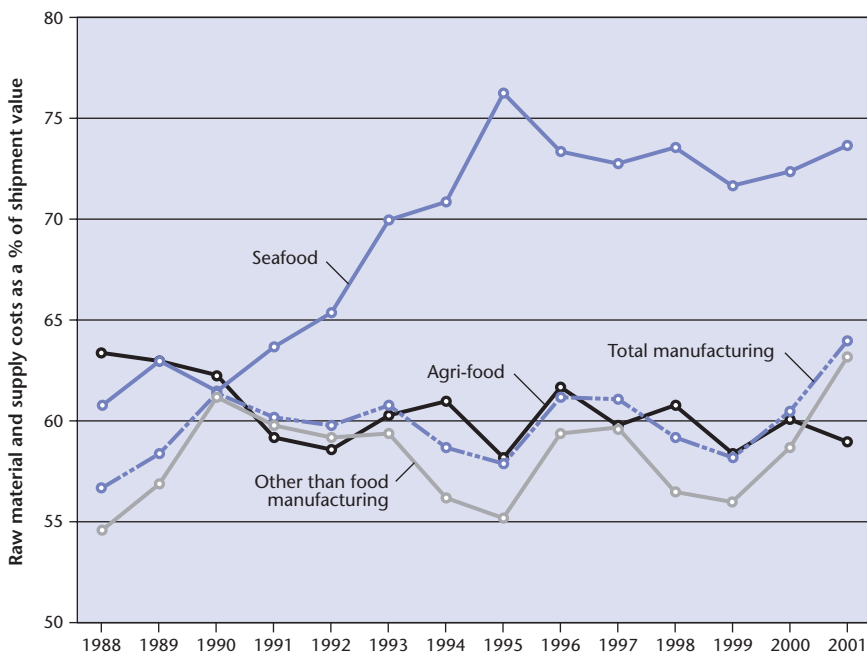
Source: Statistics Canada, *Annual Survey of Manufactures*; compiled by the author.

The performance level as reflected by these two indicators — gross profit margin and hourly productivity — shows that the agri-food processing-manufacturing industry in Atlantic Canada has adjusted relatively well to the changing economic conditions. This sector is doing well in the region and in some respects has even caught up with the country as a whole. There is no doubt that the steady level of investments made in some segments of the industry and the diversification towards value-added products have greatly contributed to this regional performance, which is also reflected in the export figures.

We should keep in mind, however, that the increase in profit margins results first and foremost from the control of the price of raw materials. We therefore established a ratio of raw material and other costs to the value of shipments. This ratio indicates that the region's agri-food industry benefits from a real advantage in this respect, an advantage that was reinforced in the 1990s. In fact, the purchase of

raw materials and supplies represented 63 percent of the industry's shipments in 1988 compared with 59 percent in 2001. During the same period, this ratio rose from 57 to 64 percent for all the manufacturing industries (see figure 38).

Figure 38
Raw Material and Supply Costs as a Percentage of Shipment Value in the Agri-Food-Processing Industry Compared with Other Industries, Atlantic Canada, 1988–2001

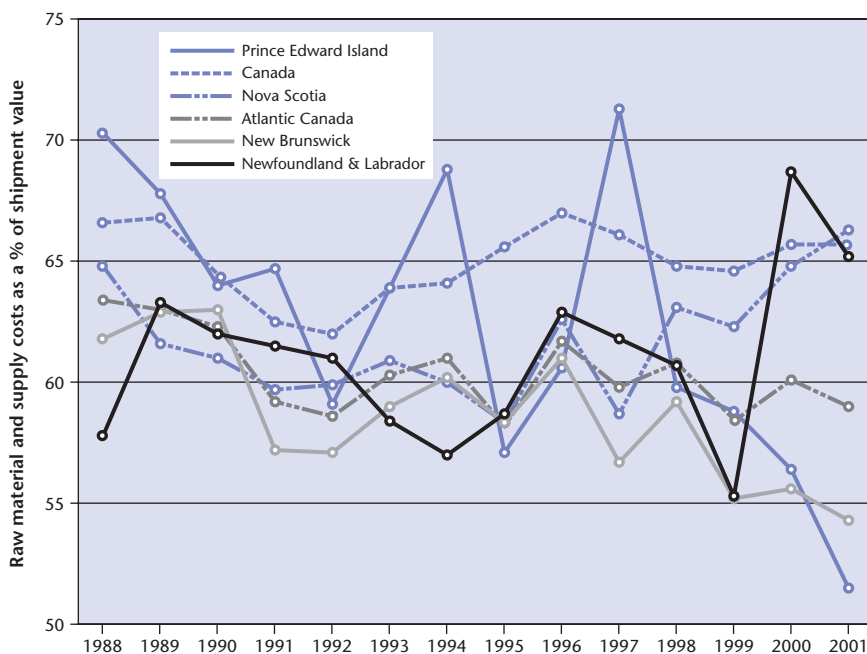


Source: Statistics Canada, *Annual Survey of Manufactures*; compiled by the author.

Provincial comparisons yield similar results. Although in Canada, raw material costs remained steady at approximately 65 percent of the value of shipments, they decreased in the Atlantic provinces. Only Nova Scotia and more recently Newfoundland differ in this regard (see figure 39). These findings are in line with those presented above; that is, the agri-food processing-manufacturing industry in these two provinces is characterized by lower profit margins and a lower hourly productivity compared with neighbouring provinces.

Figure 39

Raw Material and Supply Costs as a Percentage of Shipment Value in the Agri-Food-Processing Industry, by Region, 1988–2001



Source: Statistics Canada, *Annual Survey of Manufactures*; compiled by the author.

Our analyses of the profitability and competitiveness of the agri-food processing-manufacturing industry show that the Atlantic provinces are more than holding their own in these areas. However, to integrate into a growing movement of market globalization, the region's processing businesses, regardless of size or status, will have to base their marketing strategy on the quality of their products and on a search for market niches. Like elsewhere, these efforts should increase the rationalization of the industry, a movement which is already under way in some sectors, in particular with vegetables (potatoes and small fruits), beverages, dairy products, and meats.

These changes are taking place in the context of a commercial revolution in the entire economy, and at its forefront is the world of distribution. Two contradictory trends for SMBs seem to be emerging: one towards the concentration of distribution and another towards

the diversification of distribution chains.¹¹⁶ In the first case, distributors are moving away from their role of only shipping products and are instead taking over functions that have traditionally been left to their suppliers — such as brand management and product design and even the organization of production. It is becoming more difficult for small businesses to conduct commercial and marketing strategies autonomously. That is why they are often inclined to become partners of large distributors.

The diversification of distribution chains is in line with the trend towards diversification of demand. The market must be able to offer consumers different forms of the same product (format, packaging type, fat or vitamin content, etc.). The stock on the shelves of food stores is becoming more enriched and diversified — over fifteen thousand new food products appear every year in the retail network in the United States. Small businesses which come up with innovative or differentiated products find it easier to attract distributors.

Small producers or storekeepers can do well in this new environment if they employ methods similar to those of the large distributors. And many succeed, particularly by networking within associations (cooperatives and franchise networks). Small-sized businesses are recognized for their adaptability. However, the ones who are most likely to succeed in this globalized environment are those who are not only reactive (the flexibility aspect) but also especially proactive (the strategy aspect), the businesses that adapt their ways of operating to suit the expectations of the large companies, many of which are their clients.

The opening of markets and the commercial revolution are thus offering new opportunities to the region's SMBs. More than ever before, however, these businesses are exposed to competition, in particular from large businesses. The latter have rethought their Fordist mode of production (economies of scale, mass production) by adapting their organizational and management structure so as to respond to new demand imperatives. The three criteria — flexibility, reactivity, and innovation — are no longer the prerogative of small businesses, which increasingly see their markets and traditional market niches being wooed by the large food businesses. The small size of agri-food

116. See Philippe Maoti, *L'entreprise du XXI^e siècle : le retour de l'entrepreneuriat*, in *Délégation à l'aménagement du territoire et à l'action régionale (DATAR), Études et perspective*, no. 5 (March 2002).

businesses in Atlantic Canada combined with their relative remoteness from the large consumer markets certainly poses formidable challenges to the regional actors. And yet judging by the originality and successes of a growing number of regional SMBs in numerous sectors, including agri-food, is clear that these constraints can be overcome. This is not merely an impression, but a truly concrete commitment on the part of the agri-food industry in Atlantic Canada. This situation is confirmed in the following chapter, which focuses on imports and exports.

Chapter 5

A Greater Role for Exports

As in other parts of the country, the recent growth in the region's agri-food sector is largely due to the rapid expansion of exports, an expansion that is supported by the development of value-added production. Indeed, "Throughout the 1980s and into the mid-1990s, the Canadian food sector was still trapped into the mindset of exporting unprocessed and semi-processed product. Over that time exports of processed products accounted for between 30 percent and 40 percent of total Canadian food exports."¹¹⁷ In future, however, half of the exports will consist of consumer products, with value-added products accounting for two-thirds of the value of export growth in the country.

The Atlantic region has kept pace in this area, as evidenced by the proportion of agri-food products in regional exports; that success is a measure of higher value-added production. In this region as elsewhere, exports of mass or semi-processed products are losing ground to differentiated or specialty products, which incorporate more inputs and thereby increase their commercial value. The following figures express in various terms the evolution and structure of the export sector comprising the agri-food industry in Atlantic Canada. They point to an expanding sector which is contributing more and more to the regional economy through its know-how and its access to the large consumer markets.

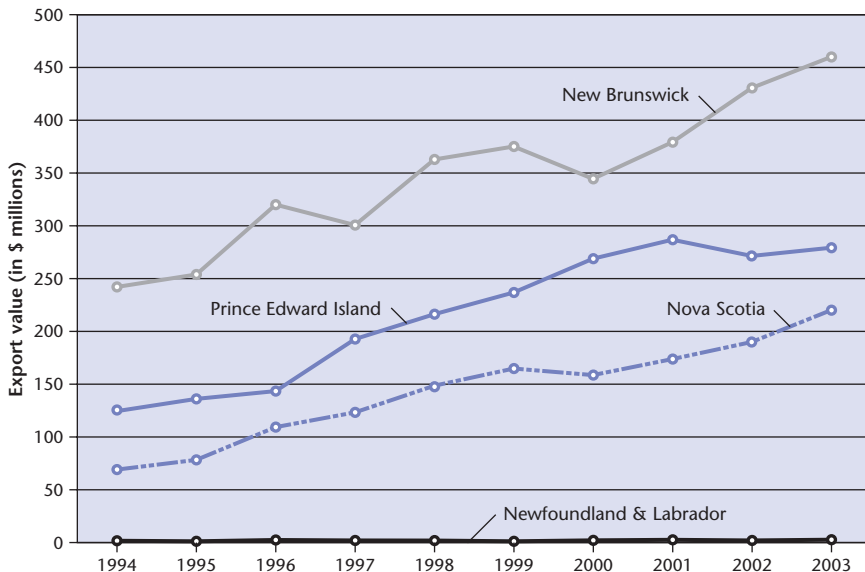
■ Growing Export Activity

First, it should be noted that in 2003 the region exported an impressive \$965 million worth of agri-food products (primary and processed). New Brunswick dominates in the area of exports and seems to have maintained its lead over the neighbouring provinces of Prince Edward Island and Nova Scotia (see figure 40). Atlantic Canada's imports, on the other hand, have remained fairly sluggish, and that has allowed

117. Canadian Agri-Food Marketing Council (CAMC), *Trade Vision*; <http://www.camc-ccca.org/trade-f.htm>.

the region to considerably improve its trade balance. As figure 41 clearly shows, while at the beginning of the decade the region's trade was either balanced or unfavourable, in 2003 it enjoyed a surplus of \$603 million.

Figure 40
Exports of Agricultural and Agri-Food Products, by Province,
Atlantic Canada, 1994–2003

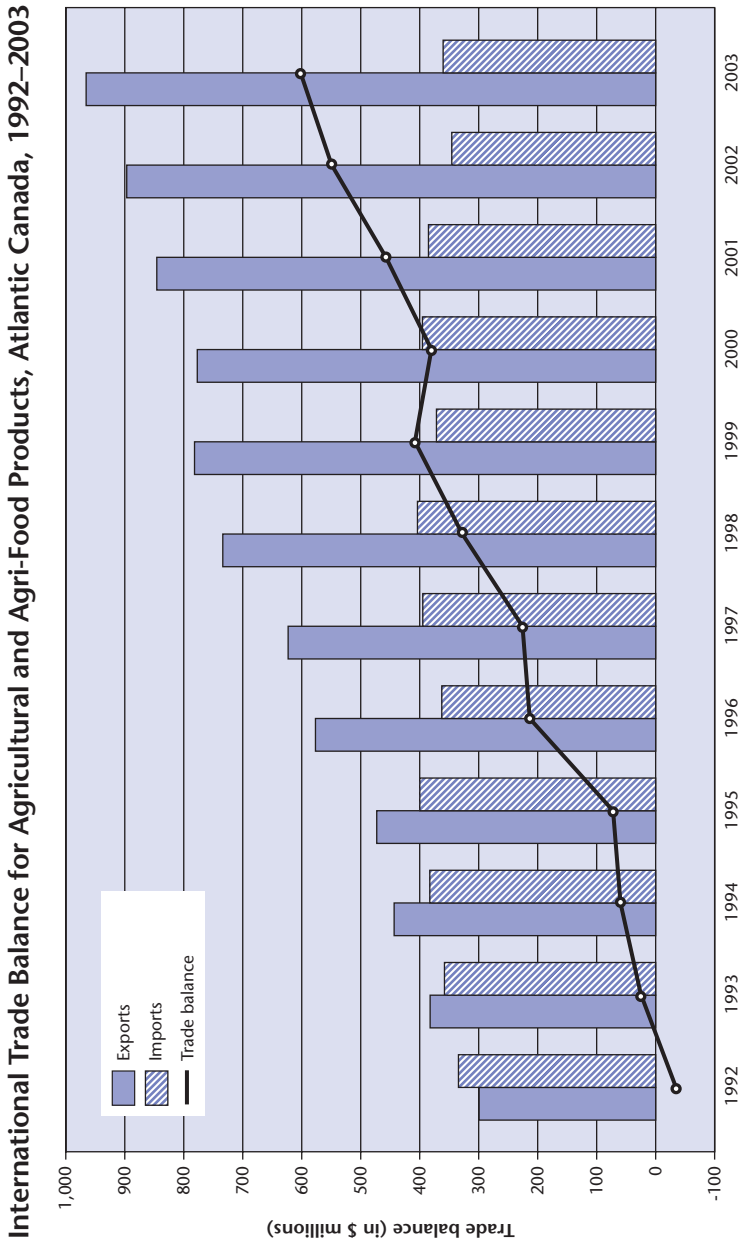


Source: Industry Canada, STRATEGIS; compiled by the author.

Each year in Atlantic Canada, exports of agri-food products represent between 5 and 6 percent of total exports, which is less than the national average. In Prince Edward Island, however, this proportion is around 40 percent (see figure 42).

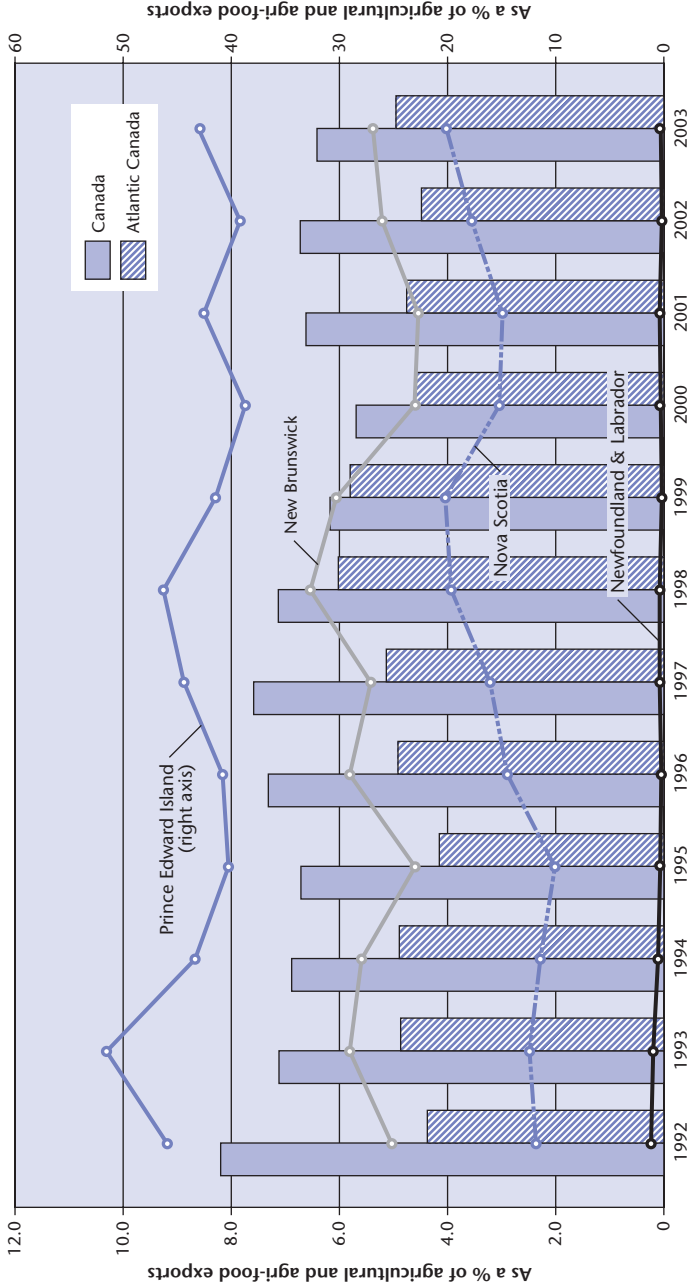
Over the decade, this sector's exports of processed products have increased considerably — to 12.4 percent annually in the region compared with 10.3 percent in Canada. This figure is much higher than the corresponding value for all manufacturing exports (all sectors combined), whose average annual growth is 9 percent in the Atlantic region and 8.5 percent in Canada. Prince Edward Island has rapidly outpaced its neighbours since the fixed link was completed with an average annual growth in exports of approximately 20 percent. Nova Scotia and New Brunswick follow with not insignificant increases of 12.8 and 9.3 percent respectively (see figure 43).

Figure 41



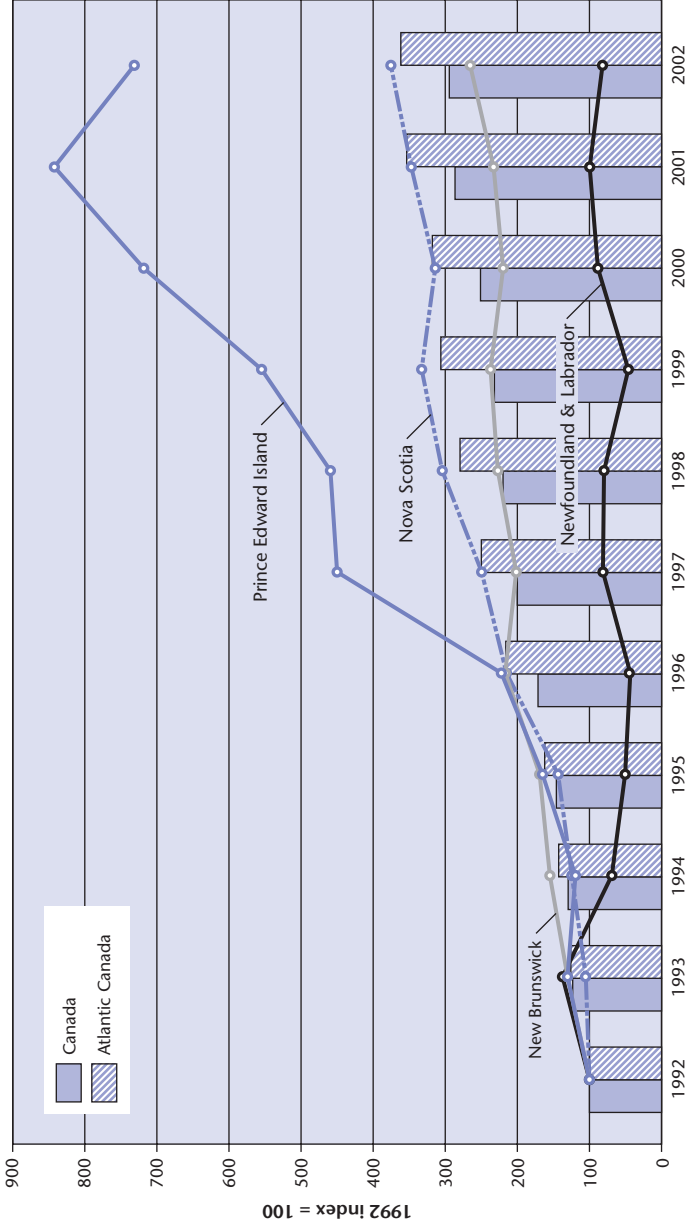
Source: Industry Canada, STRATEGIS; compiled by the author.

Figure 42
Agricultural and Agri-Food Exports as a Percent of Total Export Value, by Region, 1992–2003



Source: Industry Canada, STRATEGIS; compiled by the author.

Figure 43
Index of Agri-Food Exports, by Province, Atlantic Canada, 1992–2002

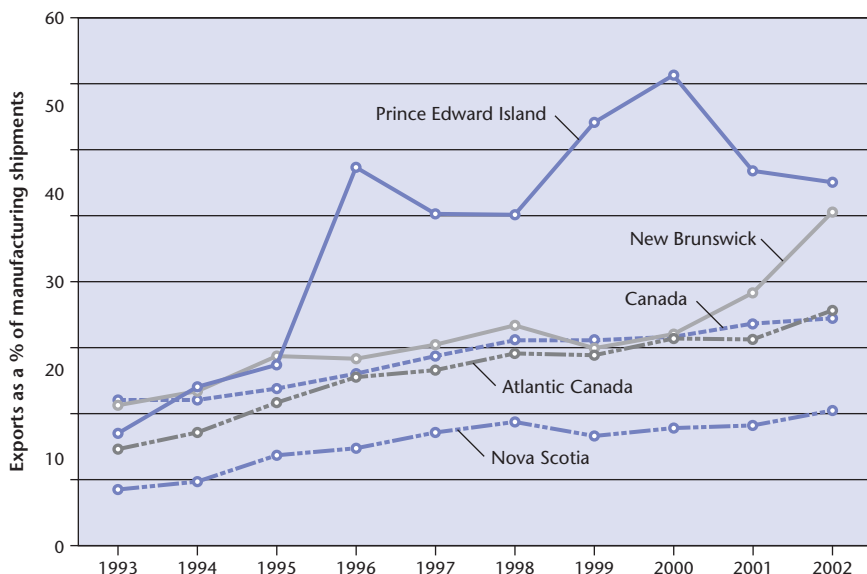


Source: Industry Canada, STRATEGIS; compiled by the author.

Greater access to markets has also allowed the sector to increase its propensity to export, which means that the value of its exports in relation to production value increased from approximately 7 percent in 1992 to approximately 27 percent in 2002. In this respect, the region has closed the gap with the national average (see figure 44).

Figure 44

Propensity for Agri-Food Industry to Export, by Province, Atlantic Canada, and by Region, 1993–2002



Sources: Statistics Canada, *Annual Survey of Manufactures*; Industry Canada, STRATEGIS. Compiled by the author.

■ Diversification of Shipped Products

Exports of some high value-added products — dairy products, prepared meats, ready-to-serve meals, french fries, beer, wine — rapidly expanded over the last decade. This has contributed to an increase in the share of value added in manufacturing shipments from 36 percent in 1990 to 40 percent in 1999. These few percentage points generate around \$100 million in additional gains for the region’s exporters.

Although the potato and its principal product, french fries, immediately spring to mind as an illustration of diversification in the agri-food sector, there has in recent years been considerable diversification in other sectors as well: horticulture (products and by-products

of small fruits such as blueberries and cranberries), meats (pork and poultry), bakeries-pastries, and dairy products. The trend towards value added can also be seen in the transition from grains to pastries, from fresh dairy products to processed by-products (cheeses, yogurts, creams, powder milk), from pork to sausages, from fresh vegetables to prepared meals, and from remainders recycled into frozen meals.

The three main agri-food-processing sectors — fruit and vegetable preserving and specialty food products manufacturing (NAICS 3114), sugar and confectionery product manufacturing (NAICS 3113), and bakeries manufacturing (NAICS 3118) — have greatly consolidated their export position. They accounted for 67.1 percent, 8.8 percent, and 6.2 percent respectively of total exports of processed agri-food products in 2003 (see table 14). In contrast, the sectors made up of meats, animal food manufacturing, and dairy products have been losing ground since 1995.

Table 14
Export Value of Main Agri-Food-Processing Sectors,
Atlantic Canada, 1995 and 2003

NAICS Sector	Value in 1995		Value in 2003		Variation
	(\$ millions)	(as a %)	(\$ millions)	(as a %)	1995–2003 (as a %)
3114 Fruit and vegetable preserving and specialty food products	195.3	62.9	523.0	67.1	167.8
3113 Sugar and confectionery product manufacturing	9.1	2.9	68.9	8.8	657.1
3118 Bakeries and tortilla manufacturing	4.4	1.4	48.2	6.2	995.5
3121 Beverage manufacturing	33.7	10.9	45.0	5.8	33.5
3119 Other food manufacturing	5.3	1.7	35.8	4.6	575.5
3111 Animal food manufacturing	23.0	7.4	21.2	2.7	-7.8
3115 Dairy product manufacturing	14.0	4.5	13.3	1.7	-5.0
3116 Meat product manufacturing	19.9	6.4	12.6	1.6	-36.7
3112 Grain and oilseed milling	5.6	1.8	11.5	1.5	105.4
Total, processed agri-food	310.3	100.0	779.5	100.0	151.2

Source: Industry Canada, STRATEGIS; compiled by the author.

Changes in the processing, composition, and type of agri-food products determine both the number and the type of businesses involved. Bulk production with low unit value essentially involves few related or support activities. In contrast, high value-added products require more inputs, more handling, and further processing. In the United States, the Department of Agriculture (USDA) estimates that every dollar of high-value exports generates indirect and support activities that are worth \$1.70 as compared with \$0.85 for bulk commodities.¹¹⁸

■ Increased Predominance of the American Market

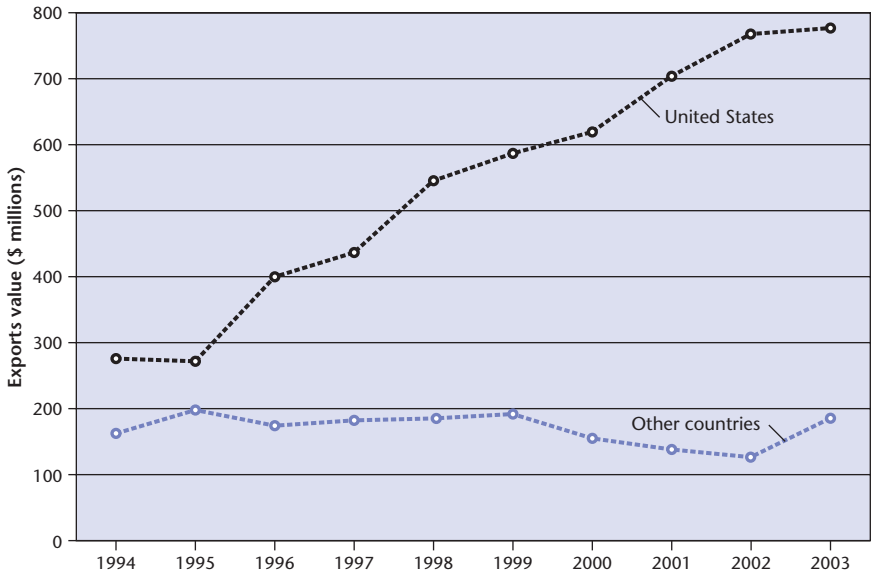
Since the mid-1990s, when it was around 60 percent, the share of Atlantic Canada's agri-food products exported to the American market has grown continuously, reaching 86 percent in 2002 (see figure 45). On the other hand, the value of regional agri-food products exported to countries other than the United States seems to have stagnated, although interesting developments can be seen in Asia, in particular China, South Korea, Indonesia, and the Philippines. While in 1995 these four countries together imported only \$3.9 million in agri-food products from Atlantic Canada, in 2003 the figure rose to \$27 million. Although modest, these sales are nevertheless significant in a rapidly expanding market.

On the American market, at least thirteen states purchased over \$10 million worth of agri-food products from Atlantic Canada in 2003. Regional producers naturally favour the New England states and the American midwest, in particular Massachusetts (\$159 million in 2003) and Maine (\$158 million) but also Pennsylvania (\$88 million), New Jersey (\$62 million), New York State (\$43 million), and Connecticut (\$35 million). In addition, there are eight states whose imports of the region's agri-food products ranged from \$5 million to \$10 million and where the sales of these products increased from \$21 million in 1995 to \$52 million in 2003. Lastly, around fifteen other states imported from \$1 million to \$5 million in agri-food products from Atlantic Canada (see table 15).

118. Kathryn L. Lipton, William Edmondson, and Alden Manchester, *The Food and Fiber System: Contributing to the U.S. and World Economies*, Economic Research Service (ERS), Bulletin no. 742 (Washington, D.C.: USDA, July 1998).

Figure 45

Agri-Food Product Exports, by Destination,
Atlantic Canada, 1994–2003



Source: Industry Canada, STRATEGIS; compiled by the author.

Table 15

Atlantic Canada's Exports of Agricultural and Agri-Food Products to the United States, 1995–2003

State	Value (\$ millions)			Relative Shares (as a %)	
	1995	2000	2003	1995	2003
Massachusetts	39.1	73.8	159.1	14.3	20.4
Maine	75.7	124.3	158.2	27.8	20.3
Pennsylvania	15.8	56.5	87.8	5.8	11.3
New Jersey	32.5	76.0	62.1	11.9	8.0
New York	19.8	47.4	43.2	7.3	5.5
Connecticut	3.4	22.9	34.5	1.2	4.4
California	3.7	7.1	20.0	1.4	2.6
Indiana	4.5	7.2	17.4	1.7	2.2
Florida	7.8	11.4	15.4	2.9	2.0
North Carolina	3.5	17.4	14.7	1.3	1.9
Ohio	3.4	35.8	14.5	1.2	1.9
Texas	1.4	6.7	11.8	0.5	1.5
Michigan	2.5	16.8	9.6	0.9	1.2
New Hampshire	1.7	16.5	7.6	0.6	1.0
Maryland	5.2	7.6	7.3	1.9	0.9
Virginia	3.0	4.0	6.7	1.1	0.9
Illinois	4.3	7.0	6.6	1.6	0.8
Georgia	3.5	6.9	6.3	1.3	0.8
Tennessee	0.9	2.7	6.2	0.3	0.8
South Carolina	1.3	3.2	6.1	0.5	0.8
Missouri	1.2	2.7	5.0	0.4	0.6
Subtotal	234.2	553.9	700.1	85.9	89.9
Rest of the United States	38.3	66.9	78.5	14.1	10.1
Total, United States	272.5	620.8	778.6	100.0	100.0

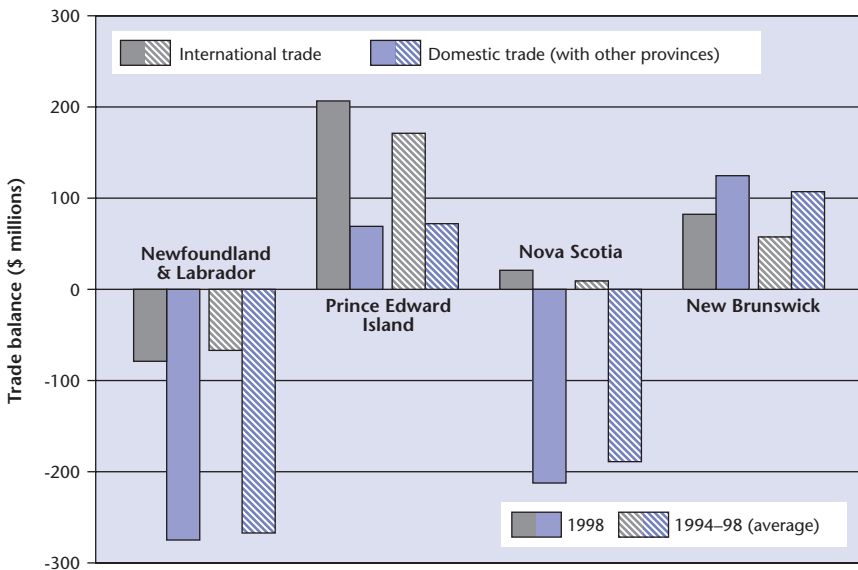
Source: Industry Canada, STRATEGIS; compiled by the author.

■ Import Substitution

Though not well understood, the subject of import substitution was raised several times during our consultations with regional producers. In fact, some of them emphasized that it is important for the regional agri-food industry to be able not only to export but also to meet domestic demand. This strategy, known as import substitution, is widely encouraged by governments. Through this strategy, governments seek, on the one hand, to reduce the amount of money leaving the territory and to maximize the multiplier effects on employment and income in their territory and, on the other hand, to enable local businesses to gain the experience and the critical size they need to face external competition.

Figure 46 shows the trade balance for agri-food products in each of the four Atlantic provinces for both the Canadian domestic market and the international foreign markets. To make it simpler, only two periods were used: 1998 (the last available year) and 1994–98, which was averaged. The results are revealing in a number of respects.

Figure 46
Interprovincial and International Trade Balance for Main Agri-Food Products, by Province, Atlantic Canada, 1998 and 1994–98 Averages



Source: Statistics Canada, *Interprovincial and International Trade in Canada, 1992–98* (June 2000), cat. no. 15-546-XPF; compiled by the author.

Note: Main agri-food products consist mostly of vegetables, fruits, meat, dairy products, and animal feed (certain meat and dairy products are not included).

These data indicate that on the whole the Atlantic region has a heavy trade deficit vis-à-vis the Canadian market. Nova Scotia, for example, had a slight international trade surplus for the 1994–98 period, but its trade deficit with Canada is approximately \$200 million per year. The situation is worse in Newfoundland. Prince Edward Island, with its small size and important agri-food sector, manages to profit from both interprovincial and international trade. The same is true of New Brunswick but on a different scale. It should be noted that New Brunswick's domestic exports represent one and a half times its international exports.

Since agri-food businesses in Atlantic Canada are confined to a comparatively small regional market, they must target national and international markets. In fact, most seem to have adopted this strategy, judging by the growing share of exports in their manufacturing shipments, which increased from 7 percent in 1992 to 22 percent in 2002. In this respect, the region has caught up with the country as a whole. The export side of the region's agri-food businesses is reflected in domestic flows (interprovincial) and in what is referred to as import substitution. Every year, the four Atlantic provinces sell approximately \$1 billion worth of agricultural and agri-food products on the Canadian market (outside their respective borders) — more than the value of their international exports. It is therefore important to take into account the trade prospects offered by the import substitution strategy, especially since this is an excellent way to foster the growth and export readiness of SMBs that only supply the local and regional markets.

Chapter 6

Socio-Economic Impact of the Agri-Food Industry

The preceding analysis demonstrates the vitality of the agri-food sector in the Atlantic provinces both in its overall dynamic and in its economic performance and openness to export markets. Our study shows that it is a diversified sector capable of adapting to the changes that are creating turmoil in the agri-food world and in the market economy generally. Moreover, we examined the close linkages that have always existed between primary agriculture, on the one hand, and food processing and manufacturing, on the other. Indeed in recent years these interindustry linkages have been especially strengthened downstream in the system, in the distribution and marketing sectors and in research and development. The reinforcement of the regulatory framework in the face of food safety challenges and the trend towards concentration in the industry as a whole have been largely responsible for tightening the linkages between the different levels of the agri-food system. These developments have produced significant effects within regional economies.

It is also important to examine the real impact of this traditional but increasingly innovative industry from new perspectives. As we underlined at the beginning of this study, the agri-food industry is rapidly integrating the features of a knowledge-based industry while maintaining its traditional foundations which are firmly rooted in the region. This is causing government agencies to broaden the very definition of the industry and to examine its impact in the regions from a broader perspective. Such a contemporary examination or assessment of the agri-food industry was provided to us by researchers at the ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ) in their overview of the biofood industry: "The regional biofood economy is based primarily on diversified production, niche markets, regional processing, regional product branding, and agri-tourism and gastronomy. Year after year, the regional biofood industry creates jobs and generates added value and sizeable investment, thereby contributing to overall regional wealth. Furthermore, it plays a defining role in heritage conservation, land use, and social

cohesion.”¹¹⁹ This key role of the agriculture and agri-food sector is clearly expressed in several MAPAQ publications, particularly in the *Bioclips* + series, which examines current issues in various segments of the industry. Indeed a recent issue underlined the dynamic character of the sectoral bases: “Given its close connection to the primary sector and its pressing need for workers, the food-processing industry is a driving force behind economic development and growth”¹²⁰ (translation). The role of the food-processing industry as economic stabilizer contributes greatly to this feature of the sector. This Canada-wide study goes on to state that the food-processing industry is better able than other manufacturing industries to absorb the exogenous phenomena, or shocks, that have upset the economy.¹²¹ Because it is labour intensive, wages are generally lower, which encourages the introduction of value-added activities in rural areas. Researchers at the United States Department of Agriculture (USDA) maintain that plants located in rural or semirural areas are more likely than their urban counterparts to get their supplies from local producers. This propensity to buy locally is considered to be a key ingredient of a rural development strategy centred on added value.¹²²

These findings have renewed expectations in rural areas for the agri-food industry, especially since it has been shown that in Canada, “The growth in the agri-food system over the 1990s has been primarily driven by value-added production.”¹²³ Indeed, we found that the Atlantic provinces do well in this field. Thus, it is from this perspective that we will first try to define the region’s agri-food system and then quantify its effects on the provincial economies.

119. Ministère de l’Agriculture, des Pêcheries et de l’Alimentation du Québec (MAPAQ), Direction des études économiques, *An Overview of the Quebec Biofood Industry, 2003*; <http://www.agr.gouv.qc.ca/ae/publicat/coupdoeil/docs/coeil03a.pdf>.

120. MAPAQ, “L’industrie des aliments et boissons : un stabilisateur économique,” *Bioclips* + 6, no. 1 (June 2003): 1.

121. *Ibid.*, 2.

122. United States Department of Agriculture (USDA), Economic Research Service (ERS), “Most Value-Added Manufacturing Increased Its Attachment to Rural Areas during 1989–94,” *Rural Conditions and Trends* 8, no. 3: 12; *idem*, “Value-Added Manufacturing Has Strong Local Linkages,” *ibid.* 3, no. 3: 23.

123. Agriculture and Agri-Food Canada, *Overview of the Canadian Agriculture and Agri-Food Sector, 2002-03-20 update*; http://www.agr.gc.ca/VueEnsemble_AgroCan.html.

■ The Impact of the Agri-Food System on the Regional Economy

In the first chapter of this study, we defined an *agri-food system* as an integrated body of sectors linked to the sectoral bases of agriculture and food processing-manufacturing. As already indicated, fish and seafood were excluded from our analysis. Based on this definition, we adopted a typology which conforms with most Canadian studies in this field. Structured around the sectoral bases of agriculture and processing, which correspond to the *agri-food sector*, is a series of systems that are more or less dependent but completely integrated into a complex chain of production, input and service suppliers, distributors, and sellers; actors also play a support role in, for example, research, management, and regulation centres.

The strategic studies team at Agriculture and Agri-Food Canada succinctly describe the scope of this system as including “agricultural input and service suppliers, primary agriculture, food processors (including beverage and tobacco processors), food retailers/wholesalers and foodservice establishments,” adding that the entire system is an integral part of the global economy since imports enter and exports leave at each link in the chain.¹²⁴ Again according to Agriculture and Agri-Food Canada, the sectoral bases of primary agriculture and food processing make up the *agri-food sector*. The *food distribution sector* includes distributors, wholesalers, and food service establishments. Input suppliers include businesses that sell production equipment and specific agricultural services and involve both manufacturing and distribution activities.¹²⁵

It is beyond the scope of the present study to examine each of these different components of the agri-food system. Rather we will focus first on the impact of the agri-food sector, which is made up of what we call the *sectoral bases* of the industry. These sectoral bases consist of crop and animal production as well as the processing-manufacturing of agri-food products, which naturally include the beverage sector. We will then examine the contribution of the system as a whole, emphasizing the distribution sector. Finally, we will present a regional and sectoral analysis of the economic impact of the agri-food industry.

124. Ibid., 2.

125. Ibid., 3.

We will now turn to the relative importance of the sectoral bases of the agri-food system in Atlantic Canada. First we will examine the GDP of the provinces and follow with a more detailed analysis of the sector's contribution to employment and income.

■ The Contribution of Agri-Industries to GDP

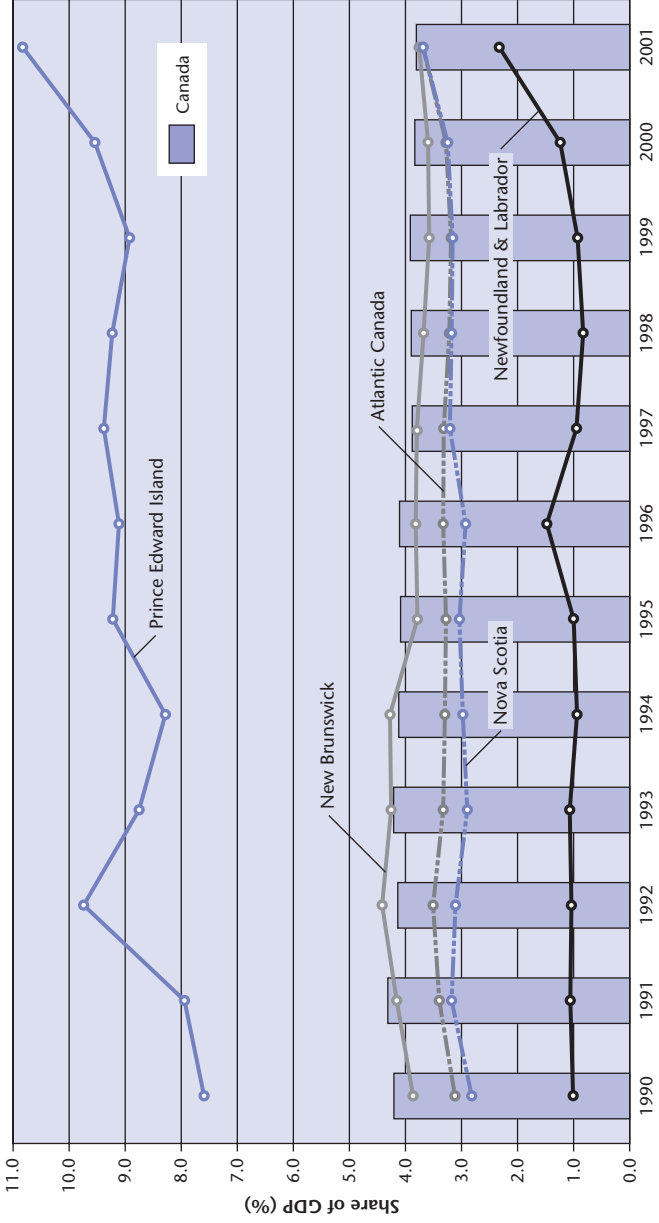
The importance of agri-industries¹²⁶ to the economy can be measured in various ways. Generally, this involves examining their contribution to GDP in both jobs and employment income. Multipliers then allow us to quantify direct, indirect, and induced contributions. We will first examine the contribution to GDP.

Although the Atlantic provinces account for only a very small share of the Canadian agri-food sector, the relative importance of agri-industries in the provincial economies is by no means insignificant. Year after year, these sectoral bases generate approximately 3.7 percent of regional GDP, which is approximately equivalent to the national average (see figure 47). New Brunswick and Nova Scotia are near the regional average; Newfoundland lags behind, though it has shown a marked improvement in recent years; and Prince Edward Island is by far the most productive: its agri-food sector represents approximately 11 percent of GDP — more than any other province in Canada.

Throughout the Atlantic region in recent years, the agri-food industry's share of GDP has increased, thanks in particular to the growth in exports of processed goods (we saw this in the preceding chapters). Another aspect of this performance is undoubtedly the relative share of processed products, which year after year represents approximately 60 percent of the region's total agri-food production, compared with approximately 50 percent in Canada (see figure 48).

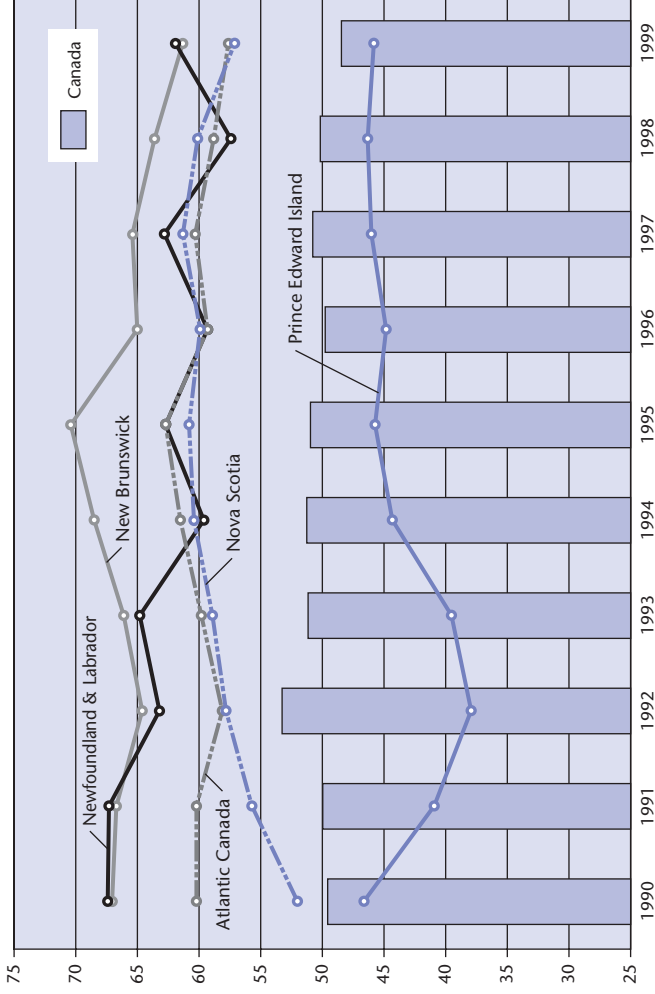
126. By *agri-industries*, we mean the crop and animal production sector as well as the food processing-manufacturing sector, excluding fish. Thus, this term refers directly to the sectoral bases.

Figure 47
Contribution of Agri-Food Industry to GDP, by Province, Atlantic Canada, 1990–2001



Source: Statistics Canada, CANSIM (matrices 8418, 8419, 8420, 8421, and 4677); compiled by the author.

Figure 48
Share of Processed Products in Agri-Food Production, by Province, Atlantic Canada, 1990–99



Source: Estimation based of production data, *Manufacturing Survey*, as well as agriculture receipts.

It is clear from the preceding indicators that the contribution of the agri-food sector to the economy of the Atlantic provinces is not far from the national average. Table 16 shows a similar finding for jobs and employment income.

Table 16
Contribution of the Agri-Food Industry to Jobs and Employment Income, by Province, Atlantic Canada, 2001

	Number of Jobs	Share of Jobs (%)	Employment Income (\$ millions)	Share of Employment Income (%)
Newfoundland & Labrador	4,400	1.89	94.3	1.56
Prince Edward Island	7,605	10.43	176.5	10.21
Nova Scotia	15,310	3.46	336.4	2.71
New Brunswick	17,065	4.67	384.1	3.97
Atlantic Canada	44,380	3.99	991.2	3.32
Canada	695,160	4.46	16,949.3	3.07

Source: Statistics Canada, 2001 census; compiled by the author.

Note: The industry includes crop and animal production, processing of food products other than fish, and beverage manufacturing.

In the Atlantic region, 4 percent of the workforce is employed in the agri-food sector, compared with 4.5 percent in the country as a whole. However, the sector generates relatively more income in the Atlantic provinces (3.3 percent of employment income in the entire economy) than in Canada (3.1 percent). This is because the gap in employment income in this sector between the two regions is less than that reported for the entire economy. In two provinces, New Brunswick and particularly Prince Edward Island, the agri-food sector registers higher than the national average: in Prince Edward Island it is two and a half times higher than in Canada.

The relative importance of the agri-food sector can also be measured by its relative influence within manufacturing industries as a whole. Thus, while in Canada the processing of food from crop or animal production (including beverage manufacturing) represents approximately 12 percent of total manufacturing GDP, in the Atlantic provinces it is higher at 18 percent.¹²⁷ It should be noted that

127. For more details on the contribution of agri-food to manufacturing GDP, see figure 7, chapter 3.

agri-food processing plays a leading role in the regional manufacturing sector in terms of its contribution to GDP, outperforming important sectors such as fish processing and pulp and paper.

■ **The Contribution of Various Agri-Industrial Segments**

The preceding data present a brief comparative profile of the economic importance of agri-industries in Atlantic Canada; however, the data are insufficient to measure the contribution of the various sectors of the region's agri-food base. For this purpose, we have at our disposal more detailed data gathered from, among other sources, the 2001 census. They show that in the four Atlantic provinces the agri-food sector directly employs 44,380 people and generates \$991 million in wages. At least 60 percent of these jobs are in crop or animal production operations or in other agricultural operations, agri-food processing accounts for the rest. Together, these basic sectors generate nearly 30 percent of the jobs in the agri-food system but a much larger share of employment income, 37.5 percent. The higher income in certain food-processing and beverage-manufacturing sectors explains this employment-income differential.

Two subsectors, fruit and vegetable preserving (including specialty foods manufacturing) and meat processing, employ over 7,500 people, or 44 percent of the entire workforce (39 percent of income) of the agri-food-processing sector (see table 17). For their part, bakeries and tortilla manufacturing, dairy products, and the beverage sector employ 6,675 workers, or 39 percent of the food-processing sector's employees (42 percent of income). Though dominant, these industries do not exclude a range of businesses that are active in various segments of the industry, from sugar and confectionery product manufacturing to the preparation of ready-to-serve meals and even pet food manufacturing. In 2000, approximately 2,800 people worked in these sectors, generating \$92 million in employment income, or 18.5 percent of the employment income of the entire food-processing sector.

Table 17

Contribution of Agri-Food Subsectors to Employment and Employment Income, by Province, Atlantic Canada, 2001

Agri-Food Sectors and Subsectors	Atlantic Canada		Newfoundland and Labrador		Prince Edward Island		Nova Scotia		New Brunswick	
	Jobs	Employment Income (\$)	Jobs	Employment Income (\$)	Jobs	Employment Income (\$)	Jobs	Employment Income (\$)	Jobs	Employment Income (\$)
1110 Farms (1111-1129)	22,870	401,119,410	1,830	25,773,720	4,995	103,241,655	8,040	128,278,200	8,005	143,825,835
Other crop and animal production activities	4,500	93,384,095	485	8,844,790	255	6,362,595	1,365	25,484,145	2,395	52,692,565
Agriculture	27,370	494,503,505	2,315	34,618,510	5,250	109,604,250	9,405	153,762,345	10,400	196,518,400
3114 Fruit and vegetable preserving and specialty food products	4,260	109,639,275	55	815,155	1,350	37,935,000	755	16,673,420	2,100	54,215,700
3116 Meat product manufacturing	3,260	88,463,575	365	7,964,665	175	5,082,700	1,405	39,799,435	1,315	35,616,775
3118 Bakeries and tortilla manufacturing	2,750	64,306,255	600	13,061,400	135	2,122,470	1,020	26,437,380	995	22,685,005
3121 Beverage manufacturing	2,130	88,152,165	555	22,441,980	95	3,271,705	760	32,190,560	720	30,247,920
3115 Dairy product manufacturing	1,795	54,251,535	270	7,375,860	310	9,708,580	700	22,606,500	515	14,560,595
3119 Other food manufacturing	1,225	35,782,510	170	5,838,480	175	4,961,425	365	10,447,760	515	14,534,845
3113 Sugar and confectionery manufacturing	825	22,945,975	10	222,310	0	0	555	15,719,265	260	7,004,400
3111 Animal food manufacturing	650	29,009,725	45	1,280,970	95	3,481,845	310	17,013,110	200	7,233,800
3112 Grain and oilseed milling	115	4,188,615	15	688,470	20	328,320	35	1,728,720	45	1,443,105
Agri-food processing	17,010	496,739,630	2,085	59,689,290	2,355	66,892,045	5,905	182,616,150	6,665	187,542,145
Total, agriculture and agri-food	44,380	991,243,135	4,400	94,307,800	7,605	176,496,295	15,310	336,378,495	17,065	384,060,545

Source: Statistics Canada, 2001 census; compiled by the author.

■ The Scope of the Sectoral Bases

As in other parts of the country, many jobs were lost in the Atlantic provinces during the recession of the early 1990s. While some of these jobs were regained during the recovery beginning in the mid-1990s, many were simply eliminated as businesses were restructured. The economic cycle, combined with structural reorganization within industries, had even graver consequences for the sectoral bases of the region's agri-food industry. Indeed, while Atlantic Canada's workforce was reduced by 3.4 percent between 1991 and 1996, the number of workers employed in primary agriculture decreased by 10 percent (-2,340 jobs); employment numbers also decreased in agri-food processing (-2,720 jobs, or 16 percent of workers in the sector). The phenomenon of rationalization was even more evident in the beverage-manufacturing sector, where one in three jobs was eliminated (see table 18).

From the latter half of the 1990s onwards, the strong demand for agri-food products helped to attract large investments to the sector. Thus, not only was the agri-food industry as a whole able to recover some of the jobs lost at the beginning of the decade; it also created enough new jobs to broaden its sectoral bases. The gains were particularly noticeable in primary activities with the development of horticulture (blueberries and cranberries), the expansion of certain large field crops (potatoes), and the addition of livestock products (especially pork and chicken).

The processing sector continued to lose jobs not only because of the trend towards concentration but more perhaps because of the increased use of technologies. The latter development allowed the sector to increase its overall productivity and maintain or even increase its market share both in Canada and abroad.¹²⁸ As a result, there was a gain of 3,085 jobs in the processing sector (including beverages) for the 1996–2001 period, which made up for the earlier losses of 2,720 jobs from 1991 to 1996. The segments that most contributed to reinforcing the foundations of Atlantic Canada's agri-food-processing sector during the economic recovery were fruit and vegetable preserving and specialty food products, meat product manufacturing, and especially bakeries. The decline in jobs in the dairy product segment, which had started in the early 1990s, continued, while the beverage sector reached a ceiling on jobs.

128. In this respect they have followed the Canadian trend, an indication of the sector's surprising capacity for adjustment during the period, especially in the areas of productivity and the return on assets in general. See Rick Burroughs et al., *Businesses in the Food Chain Survive the Turmoil of the 1990s* (Ottawa: Statistics Canada, Agriculture Division, September 2001), cat. no. 21-004-XIE.

Table 18

Employment and Aggregate Income in the Agri-Food Industry, by Sector, Atlantic Canada, Selected Years

	1991 ^a			1996 ^a			2001 ^b			Employment Variation		
	Number of jobs	Aggreg. Income (\$ millions)	Number of jobs	Aggreg. Income (\$ millions)	Number of jobs	Aggreg. Income (\$ millions)	Number of jobs	Aggreg. Income (\$ millions)	Number of jobs	1991-96 (%)	1996-2001	1991-96 (%)
Primary agriculture	23,260	381.0	20,920	347.0	27,370	494.5	-2,340	6,450	-10.1	30.8		
Agri-food processing	16,645	337.2	13,925	357.5	17,010	496.7	-2,720	3,085	-16.3	22.2		
3114 Fruit and vegetable preserving and specialty food products	4,000	77.7	3,665	81.8	4,260	109.6	-335	595	-8.4	16.2		
3115 Dairy product manufacturing	2,640	62.4	2,230	63.1	1,800	54.3	-410	-430	-15.5	-19.3		
3116 Meat product manufacturing	3,075	62.3	2,970	79.9	3,260	88.5	-105	290	-3.4	9.8		
3118 Bakeries and tortilla manufacturing	1,700	40.7	1,815	47.0	2,745	64.3	115	930	6.8	51.2		
3121 Beverage manufacturing	3,030	95.5	2,045	83.8	2,130	88.2	-985	85	-32.5	4.2		
Other	5,230	94	3,245	86	2,815	91.8	-1,985	-430	-38.0	-13.3		
Agri-food sectoral bases (including beverages)	42,935	813.7	38,890	788.2	44,380	991.2	-4,045	5,490	-9.4	14.2		
As a % of economy	3.86	3.49	3.62	3.20	3.99	3.50						

^a Figures for 1991 and 1996 are based on standard industrial classification (SIC) codes.

^b NAICS classification for 2001.

Source: Statistics Canada, 1991, 1996, and 2001 censuses; compiled by the author.

■ The Geographical Distribution of Sectoral Bases

Globalization and its corollary, the concentration of industries, have resulted in a relocation of employment from less densely populated outlying districts to urban areas or the urban fringe. This phenomenon is particularly evident in Canada, where the rural-urban divide continues to deepen.¹²⁹ Clearly the agri-food industry will not be able to avoid these centripetal forces, especially since the demand for food products is increasingly channeled towards large centres and then redistributed to small markets. In this context, it is useful to examine the spatial distribution of agri-food activity in Atlantic Canada in recent years, that is, since the early 1990s. To do this, we analyzed by urban and rural area some interesting socio-economic data gathered from the censuses of 1991, 1996, and 2001. Below, we will present the spatial profile of the industry during the 1990s' restructuring period.

Unlike certain industrial sectors whose bases are strongly connected to urban agglomerations, the agri-food world in Atlantic Canada is primarily rural. According to data from the 2001 census, nearly three out of four jobs in agriculture in Atlantic Canada are found in rural areas; this proportion drops dramatically to approximately 45 percent for the agri-food-processing sector. It should be pointed out, however, that several activities surveyed in rural areas are located close to large urban centres. Nevertheless, the fact remains that the sectoral bases of the agri-food industry are strongly rooted in rural Atlantic Canada. This is confirmed by table 19, which shows that 63 percent of agri-food jobs are located in rural areas where they generate only 55 percent of income. It also shows that the share of jobs in agriculture and the processing of agricultural products is considerably larger in rural than in urban areas: 6.0 percent of rural jobs compared with 2.6 percent of urban jobs.

129. On this subject, see Mario Polèse and Richard Shearmur, *The Periphery in the Knowledge Economy: The Spatial Dynamics of the Canadian Economy and the Future of Non-Metropolitan Regions in Quebec and the Atlantic Provinces* (Montreal: INRS-Urbanisation; Moncton: Canadian Institute for Research on Regional Development, 2002).

Table 19
Employment and Aggregate Income in the Agri-Food Industry, Urban and Rural Areas, Atlantic Canada, 2001

	Total, Atlantic Canada		Urban Areas (CMAs+ CAs)		Rural Areas		Rural Areas as a % of Atlantic Canada	
	Number of Jobs	Aggregate Income (\$)	Number of Jobs	Aggregate Income (\$)	Number of Jobs	Aggregate Income (\$)	Number of Jobs	Aggregate Income
1111-1129 Farms	22,875	401,119,410	5,825	107,901,121	17,050	293,218,289	74.5	73.1
Other	4,495	93,384,095	1,345	33,91,811	3,150	59,392,284	70.1	63.6
Primary agriculture	27,370	494,03,505	7,170	141,922,506	20,200	352,580,999	73.8	71.3
Agri-food processing	17,010	496,739,630	9,285	301,024,216	7,755	195,715,414	45.6	39.4
3114 Fruit and vegetable preserving and specialty food products	4,260	109,639,275	895	23,353,166	3,365	86,286,109	79.0	78.7
3115 Dairy product manufacturing	1,800	54,252,535	1,255	38,789,848	545	15,461,687	30.3	28.5
3116 Meat product manufacturing	3,260	88,463,575	1,910	52,547,364	1,350	35,916,211	41.4	40.6
3118 Bakeries and tortilla manufacturing	2,745	64,306,255	1,745	42,249,210	1,000	22,057,045	36.4	34.3
3121 Beverage manufacturing	2,130	88,152,165	1,770	76,780,536	360	11,371,629	16.9	12.9
Sectoral bases of agri-food	44,380	991,243,135	16,455	443,085,681	27,955	548,157,454	63.0	55.3
As a % of economy	3.99	3.49	2.55	2.3	5.99	4.94		
As a % of Atlantic Canada	100.0	100.0	37.1	44.7	62.9	55.3		

Source: Statistics Canada, 2001 census; compiled by the author.

Nevertheless, most jobs in the processing sector — 9,285 of the 17,010 jobs, or 54.6 percent — are located in urban areas. The only exception to this finding is the fruit-and-vegetable-preserving industry (including specialty foods manufacturing). Moreover, revenues from agri-food processing are considerably higher in the dairy product segments (\$28,368) and especially in beverages (\$40,238), two sectors with a strong presence in urban areas (77 percent of jobs). This helps to explain the gap noted in rural areas between the share of employment (45.6 percent) and of income (39.4 percent) among jobs in agri-food processing.

■ The Influence of the Maritime Belt

A quick glance at the distribution of agricultural and agri-food jobs in the urban areas of Atlantic Canada shows that they are concentrated in the central part of the Maritimes, from Saint John (NB) to Halifax; in between are Fredericton, Moncton, Summerside and Charlottetown, Truro, New Glasgow, and Kentville. Together, these nine urban agglomerations account for 70 percent of the entire urban workforce in Atlantic Canada but 80 percent of the agricultural and agri-food jobs and revenues generated in the urban areas. Table 20 shows the jobs and income generated by the agri-food industry in Atlantic Canada's main urban centres in 2001 both in absolute figures and in relation to the economy as a whole. It can be seen that the agri-food industry is particularly important in the Kentville and Summerside regions, where it represents from 11 to 15 percent of jobs and employment income in the economy. This share is smaller but nevertheless important in Charlottetown (5.8 percent), Truro (5.5 percent), and Moncton (3.6 percent). It should be noted, however, that these urban concentrations exclude the contributions of areas that are peripheral to the main urban centres (e.g., the counties of Sussex, Amherst, and Hants).

Table 20
Employment and Aggregate Income in the Agri-Food Industry,
by Urban Agglomeration, Atlantic Canada, 2001

	Direct Jobs	As a % of Economy	Aggregate Income (\$)	As a % of Economy
Halifax CMA	2,400	1.24	73,036,120	1.22
Moncton CA	2,305	3.57	57,387,940	3.29
St. John's CMA	1,860	2.12	50,986,185	1.98
Charlottetown CA	1,835	5.76	46,835,235	5.70
Kentville CA	1,825	14.88	37,028,595	12.55
Truro CA	1,215	5.51	26,731,895	4.79
Saint John CMA	1,160	1.92	32,503,205	1.86
Fredericton CA	1,070	2.34	22,380,280	1.74
Summerside CA	970	11.41	24,222,495	12.04
Cape Breton CA	615	1.44	12,876,020	1.35
New Glasgow CA	370	2.21	6,123,565	1.34
Edmundston CA	240	2.14	5,350,645	1.87
Grand Falls–Windsor CA	160	2.01	2,837,085	1.39
Corner Brook CA	160	1.34	3,204,820	1.03
Campbellton CA	135	1.95	1,568,070	1.01
Bathurst CA	120	1.05	2,755,140	0.88
Total, CMAs + CAs	16,440	2.55	405,827,295	2.23

Source: Statistics Canada, 2001 census; compiled by the author.

Despite the rationalizations that have affected the various segments of the agri-food industry, the rural-urban balance seems to persist, at least as it relates to the geographical distribution of jobs. Thus, unlike the economy as a whole, in which the share of the rural workforce is diminishing as people migrate from rural to urban centres, the agricultural and agri-food workforce tends to stay put. The number of workers is even growing in most of the major sectors, with the exception of dairy products, thus helping to maintain the balance of rural areas both in processing and in primary agricultural activities. This is evident in table 21, which even shows relative gains in the rural areas, particularly in the crop and animal production sectors.

Table 21
**Five-Year Employment Variation in the Agri-Food Industry,
 Urban and Rural Areas, Atlantic Canada, 1996–2001**

	Urban Areas		Rural Areas		Rural Areas as a % of Atlantic Canada		
	1991–96	1996–2001	1991–96	1996–2001	1991	1996	2001
All industries	-18,110	35,355	-19,700	1,590	43.5	43.2	41.9
Agricultural industries	-625	1,230	285	3,220	71.8	74.1	73.8
Agri-food processing	-1,765	240	-1,940	830	45.1	43.4	45.5
3116 Meat product manufacturing	20	30	-125	260	39.5	36.7	41.4
3114 Fruit and vegetable preserving and specialty food products	15	145	-350	450	81.6	79.5	79.0
3115 Dairy product manufacturing	-200	-300	-210	-130	33.5	30.3	30.3
3118 Bakeries and tortilla manufacturing	-135	630	250	300	26.5	38.6	36.4
3121 Beverage manufacturing	-820	35	-165	50	15.7	15.2	16.9
Agri-food sectoral bases	-2,390	1,470	-1,655	4,050	59.5	61.5	62.9

Source: Statistics Canada, 1991, 1996, and 2001 censuses; compiled by the author.

Beyond the Sectoral Bases: The Importance of Distribution

Although agriculture and agri-food processing are of major importance in both rural areas and urban centres, it should be noted that most jobs and income are generated by the agri-food system outside its basic sectors. Most of them are found in related sectors (such as the distribution and sales of agricultural and agri-food products or the supply of inputs to crop and animal producers as well as food processors and manufacturers), in food services, and in support activities such as research and development and management of the industry. The weight of these related activities is increasing all the more rapidly since the agricultural and processing sectors are quickly becoming integrated into the rest of the industry. Thus, according to some ana-

lysts, recent developments, particularly in the biotechnology field, are making it necessary to adopt a broader definition of the agri-food sector in order to take this new reality into account.¹³⁰

Since it is beyond the scope of this study to present or quantify the various components of the agri-food system, we will rely on employment and income multipliers to assess the impact of the sectoral bases in the Atlantic region. Nevertheless, it is worthwhile to present the contribution of a segment that is very closely linked to the sectoral bases of agriculture and food processing — the wholesale and retail distribution of agricultural and agri-food products.

■ The Key Role of Food Distribution

Food distribution plays several roles in the agricultural system. According to analysts at Agriculture and Agri-Food Canada, “It acts as an interpreter of consumer preferences, it performs quality checks and supplies feedback to upstream industries and it acts as quasi-manufacturers with respect to private label development and marketing.”¹³¹ These roles, which have devolved on the distribution sector, have all the more impact on the agri-food sectoral bases because of the latter’s extensive integration into this field. In fact, at least 60 percent of the country’s sales of agri-food products are made by a select group of five distributors; ten years ago it was 50 percent.¹³²

Although the related and support activities of the agri-food industry tend to be developing more in the cities and the centres that are well connected to the large food product markets, distribution in particular plays a key role in the Atlantic region. Table 22 shows the contribution of the distribution sector to the entire agri-food system in the region. It should be underlined that these data do not cover the full extent of the system as defined by Agriculture and Agri-Food Canada since they do not take into account input suppliers or agriculture and food-processing support activities. Nevertheless, they demonstrate that distribution plays an undeniably important role.

130. See Raymond Dupuis and Maurice Doyon, *Impact of Bio-Food Industry Activities in Canada* (Montreal: Agriculture and Agri-Food Canada, 2003); http://www.atn-riae.agr.ca/can/3589_e.htm.

131. Agriculture and Agri-Food Canada, *Overview of the Canadian Agriculture and Agri-Food Sector* (June 2003), 32; publication 2211E; http://www.agr.gc.ca/spb/rad-dra/publications/system/system_e.pdf.

132. *Ibid.*, 34.

Table 22
Employment and Aggregate Income in the Agri-Food System, by Sector, Atlantic Canada, 2001

	As a % of Agri-Food System		
	Number of Workers	Aggregate Income (\$)	Number of Workers
1110 Farms (1111-1129)	22,870	401,119,410	
Other crop and animal production activities	4,500	93,384,095	
Agriculture	27,370	494,503,505	18.3
3111 Animal food manufacturing	650	29,009,725	
3112 Grain and oilseed milling	115	4,188,615	
3113 Sugar and confectionery manufacturing	825	22,945,975	
3114 Fruit and vegetable preserving and specialty food products	4,260	109,639,275	
3115 Dairy product manufacturing	1,795	54,251,535	
3116 Meat product manufacturing	3,260	88,463,575	
3118 Bakeries and tortilla manufacturing	2,750	64,306,255	
3119 Other food manufacturing	1,225	35,782,510	
3121 Beverage manufacturing	2,130	88,152,165	
Agri-food processing	17,010	496,739,630	11.4
4111 Farm product wholesaler-distributors	155	2,591,615	
4131 Food wholesaler-distributors	8,425	242,917,910	
4132 Beverage wholesaler-distributors	795	20,276,890	

4183 Agricultural supplies wholesaler-distributors	385	10,257,390	
Wholesale distribution of agri-food products	9,760	276,043,805	6.5
4451 Grocery stores	31,730	490,538,450	
4452 Specialty food stores	2,150	37,070,650	
4453 Beer, wine, and liquor stores	1,840	45,070,080	
7221 Full-service restaurants	21,805	320,470,245	
7222 Limited-service eating places	27,760	320,812,805	
7223 Special food services	4,745	87,740,585	
Retail sale of agri-food products	90,030	1,301,702,815	63.7
Total, agri-food system	144,170	2,585,377,630	100.0
As a % of economy	13.4	8.9	

Source: Statistics Canada, 2001 census; compiled by the author.

Note: Related and support activities connected with the agriculture and agri-food industries are not included.

The wholesale distribution of agri-food products employs 9,760 workers in the Atlantic region and generates employment income in the order of \$276 million. This link is closely connected to the sectoral bases and has greater relative importance in the region than in the country as a whole. Fully 6.5 percent of jobs and 10.4 percent of employment income from agri-food in the region are attributable to wholesale distribution, compared with 5.5 percent and 9.5 percent respectively for Canada. The same is true for the agri-food retail sales sector, which, together with food services, employs 90,000 workers in the region. In short, wholesale and retail distribution provides nearly seven out of ten jobs in the entire agri-food system in Atlantic Canada and generates 61 percent of employment income.

■ Economic Spin-Offs from the Agri-Food Sector: A Well-Distributed Impact

This overview of agri-food industries would not be complete without evaluating the effect of their economic spin-offs on Atlantic Canada. Although there are few studies available on the economic impact of agri-food activities in the region, we can make use of a number of indicators contained in several studies produced at the federal and provincial levels and even abroad — for example, in several American states. In Canada, most studies on the subject apply either to all food industries or only to biofood industries; few focus specifically on the economic impact of the agri-food sector.¹³³ Among these is a recent study by Dupuis and Doyon, which provides a fairly detailed evaluation of the biofood industry in Canada and its main regions, including Atlantic Canada; however, their analysis covers all biofood industries, even including the fishing industry, aquaculture, and seafood processing.

The primary focus of our study is the activities surrounding agriculture and agri-food, not including seafood products, which, as already explained, account for a large proportion of the region's food industry. Although the studies mentioned and many others conducted by government departments and agencies are not specifically concerned with the economic impact of the region's agri-food activities, they nevertheless helped us to understand the dynamics and relative importance of various segments of the food industry (agri-food, agri-

133. See, for example, Dupuis and Doyon, *Impact of Bio-Food Industry*; Agriculture and Agri-Food Canada, *Overview of the Canadian Agriculture and Agri-Food Sector*; Canadian Federation of Agriculture, "Impact of Agriculture on the Economy;" and MAPAQ, *An Overview of the Quebec Biofood Industry, 2003*.

culture and food services), including input suppliers, processors, and distributors.

Studies that focus specifically on economic spin-offs generally identify three levels or effects, that is, *direct or immediate effects*, *indirect effects*, and *induced effects*. Direct effects result from expenditures and investments that are directly linked to agri-food industries. These initial expenditures give rise to income flows throughout the agri-food chains; however, the income flows tend to decrease through leakages (purchases outside the region). Once farm operators or processors, for example, make an additional investment for the purpose of increasing production or improving productivity, they order more inputs and capital goods. These indirect expenditures in turn boost the business of suppliers and related manufacturers, and the resulting increased sums (income and salaries) then give rise to other waves of spending; the spending stimulates new production growth that spreads throughout the entire economy. These successive waves are summed up in a well-known concept, the macroeconomic multiplier.

Input-output models, based on the structure of relations between industries, produce the data needed to carry out an economic impact analysis, which is then used to calculate a multiplier coefficient for each industry. Generally, the multiplier varies according to the intensity of exchanges between the industrial and service branches; it also fluctuates according to the intensity of relations between the various industrial and service sectors. The more intense and regular these exchanges are, the higher the employment and income multipliers. Although the multipliers may fluctuate between territories and according to type of activity, in the agri-food industry they generally range from 1.25 to 2.25. That is to say that every dollar directly invested or spent within the sectoral bases of agriculture and agri-food generates an additional \$1.25 to \$2.25 in the economy.

Although we lack precise data on the employment and income multipliers for the agri-food industry in Atlantic Canada, we do have several indications of the size of the multipliers in this type of industry. Dupuis and Doyon, for example, estimate that the multiplier coefficients for the region's entire biofood industry are 1.7 for income, 2.0 for value added, and 1.76 for employment.¹³⁴ Moreover, Statistics Canada has estimated that in Nova Scotia's agri-food industry, the multiplier coefficients for income and employment are

134. See Dupuis and Doyon, *Impact of Bio-Food Industry*, 10.

1.47 and 1.38 respectively in the primary agricultural sector, 2.24 and 2.58 respectively in agri-food processing, and 1.43 and 1.64 respectively in beverage manufacturing.¹³⁵ These estimates roughly correspond to the findings in two other studies carried out in the American states of Arkansas and Indiana. In both cases, we considered the multipliers for the sectoral bases only (agriculture and agricultural product processing). In Arkansas, the multipliers are 1.81 for employment, 1.78 for income, and 1.87 for value added.¹³⁶ In Indiana, the multipliers were estimated to be 1.85 for employment and 1.81 for value added. It should be noted that the indirect and induced effects for employment are greater in agriculture, while the income or value-added multipliers are clearly higher in the agri-food-processing sector.¹³⁷

In light of these studies, it seems that the coefficients calculated by Statistics Canada as part of its impact study of the agri-food sector in Nova Scotia are in line with the objectives of the current analysis. We will now summarize the impact that agriculture and agri-food processing can have on employment and income in the Atlantic region. The estimates are based on 2001 census data on employment and income in the three subsectors.

■ Economic Impact: An Overview

The application of multiplier coefficients to agriculture and agri-food processing in the Atlantic provinces reveals that these industries have a considerable economic impact in the region; for 2001 they are in the order of 80,000 jobs and \$1.77 billion. These are the direct, indirect, and induced effects of agricultural and agri-food-processing industries in Atlantic Canada. Table 23 and figures 49 and 50 show these effects by sector for the entire region. It can be seen that the agricultural and agri-food-processing activities each represent almost an equivalent share of the jobs generated, that is, approximately 48 percent of the agri-food industry. However, a clear distinction between these two sectors can be seen when considering direct and induced jobs.

135. According to Statistics Canada, "Nova Scotia Input-Output Model."

136. Wayne P. Miller and Yoko Soto, *Contribution of Agriculture to the Arkansas Economy* (Fayetteville, AR: Arkansas Agricultural Experiment Station, University of Arkansas Division of Agriculture, Special Report 196, November 1999), 22, table 1.

137. David Broomhall, "The Economic Contribution of the Food and Agricultural System in Indiana" (West Lafayette, IN: Department of Agricultural Economics, Purdue University, Staff Paper # 96-18, August 1996), 9, table 1.

Table 23
Economic Impact of the Agri-Food Industry by Major Sector,
Atlantic Canada, 2001

	Number of Jobs			
	Primary Agriculture	Processing-Manufacturing	Beverages	Total, Agri-Food
Atlantic Canada				
Direct	27,370	14,880	2,130	44,380
Induced	10,401	23,510	1,363	35,274
Total^a	37,771	38,390	3,493	79,654
Share of agri-food industry (as a %)				
Direct	61.7	33.5	4.8	100.0
Induced	29.5	66.7	3.9	100.0
Total^a	47.4	48.2	4.4	100.0
	Employment Income (\$ millions)			
	Primary Agriculture	Processing-Manufacturing	Beverages	Total, Agri-Food
Atlantic Canada				
Direct	494.5	408.5	88.2	991.2
Induced	232.4	506.5	37.9	776.9
Total^a	726.9	915.0	126.1	1,768.1
Share of agri-food industry (as a %)				
Direct	49.9	41.2	8.9	100.0
Induced	29.9	65.2	4.9	100.0
Total^a	41.1	51.8	7.1	100.0

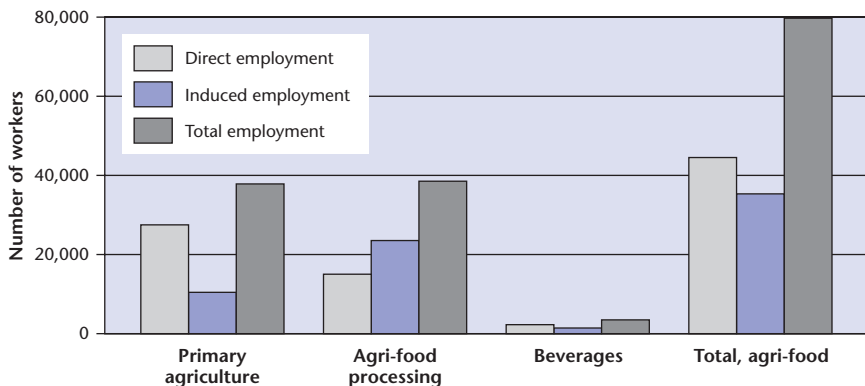
Sources: Statistics Canada, 2001 census, data on employment and income by industry; Statistics Canada, "Nova Scotia Input-Output Model." Compiled by the author.

^a The employment multipliers used are 1.38 for the primary agricultural sector, 2.58 for the agri-food-processing sector, and 1.64 for the soft drink and alcoholic drink sector. The income multipliers are 1.47 for the primary agricultural sector, 2.24 for the agri-food-processing sector, and 1.43 for the beverage sector.

The agricultural sector naturally includes a larger proportion of direct jobs (61.7 percent versus 29.5 percent for the processing sector), while two out of three induced jobs are contributed by the presence of the processing sector. This difference is normal since agriculture has or maintained downstream linkages that are or were much less dense than those in the processing sector. The latter serves as a communication link between primary agriculture and the important distribution sector, often playing the role of intermediary with crop and animal producers in the areas of management, technologies, and

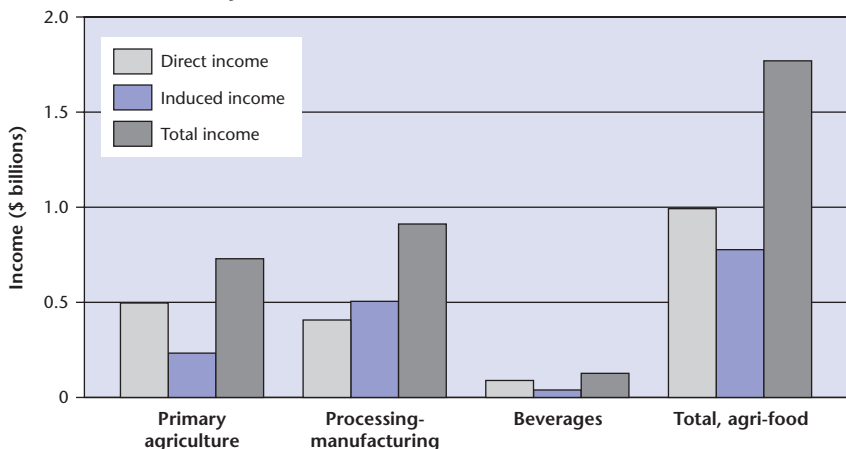
input supplies. Moreover, value added is concentrated in the processing sector. It is not surprising, therefore, that the multipliers used are higher than those used for primary agriculture or even for the beverage sector.

Figure 49
Economic Impact of the Agri-Food Industry on Employment, by Province, Atlantic Canada, 2001



Sources: Statistics Canada, 2001 census; Statistics Canada, "Nova Scotia Input-Output Model." Compiled by the author.

Figure 50
Economic Impact of the Agri-Food Industry on Employment Income, by Province, Atlantic Canada, 2001



Sources: Statistics Canada, 2001 census; Statistics Canada, "Nova Scotia Input-Output Model." Compiled by the author.

The economic spin-offs generated by the agri-food sector at the provincial level are summarized in table 24. We find there that New Brunswick reported the highest number of jobs (30,871) and the largest income (\$684 million) from the agri-food sector; close behind was Nova Scotia, where agri-food activities generated some 27,500 jobs and \$609 million. In beverage manufacturing, however, Nova Scotia outperformed New Brunswick.

Considering its small population, Prince Edward Island has performed remarkably well. Its economic effects are equivalent to nearly half of Nova Scotia's even though it has only one-seventh of the population. More precisely, it generates 13,232 jobs and \$308 million in income. Lagging behind is Newfoundland and Labrador, where agri-food activities directly and indirectly provide 8,052 jobs and generate \$166 million in employment income. However, this is a very substantial contribution given that with the exception of fish, the province must import most of its food products.

Table 24
Economic Impact of the Agri-Food Industry, by Major Sector
and Province, Atlantic Canada, 2001

	Number of Workers			
	Primary Agriculture	Processing- Manufacturing	Beverages	Total, Agri-Food
Newfoundland and Labrador				
Direct	2,315	1,530	555	4,400
Induced	800	2,417	355	3,652
Total^a	3,195	3,947	910	8,052
Prince Edward Island				
Direct	5,250	2,260	95	7,604
Induced	1,995	3,571	61	5,627
Total^a	7,245	5,831	156	13,232
Nova Scotia				
Direct	9,405	5,145	760	15,310
Induced	3,574	8,129	486	12,189
Total^a	12,979	13,274	1,246	27,499
New Brunswick				
Direct	10,400	5,945	720	17,065
Induced	3,952	9,393	461	13,806
Total^a	14,352	15,338	1,181	30,871
	Employment Income (\$ millions)			
	Primary Agriculture	Processing- Manufacturing	Beverages	Total, Agri-Food
Newfoundland and Labrador				
Direct	34.6	37.3	22.4	94.3
Induced	16.3	46.3	9.6	72.1
Total^a	50.9	83.6	32.0	166.4
Prince Edward Island				
Direct	109.6	63.6	3.3	176.5
Induced	51.5	78.9	1.4	131.8
Total^a	161.1	142.5	4.7	308.3
Nova Scotia				
Direct	153.8	150.4	32.2	336.4
Induced	72.3	186.5	13.8	272.6
Total^a	226.1	336.9	46.0	609.0
New Brunswick				
Direct	196.5	157.2	30.3	384.0
Induced	92.4	194.9	13.0	300.3
Total^a	288.9	352.1	43.3	684.3

Sources: Statistics Canada, 2001 census, data on employment and income by industry; Statistics Canada, "Nova Scotia Input-Output Model." Compiled by the author.

^a The employment multipliers used are 1.38 for the primary agricultural sector, 2.58 for the agri-food processing sector, and 1.64 for the soft drink and alcoholic drink sector. The income multipliers are 1.47 for the primary agricultural sector, 2.24 for the agri-food processing sector, and 1.43 for the beverage sector.

General Conclusion

Enriched by its geographical and climatic diversity, Canada boasts a wide range of crop and animal production, which has earned it international recognition as a supplier of basic products such as wheat, soy, and beef. The nation is the third largest exporter of agricultural and agri-food products in the world — behind the United States and the European Union — and the fifth largest importer. With 70 to 75 percent of Canadian exports concentrated in the North American market (United States and Mexico), compared with 40 percent twelve years ago, it is not surprising to find that 80 percent of foreign investment in the Canadian food-processing sector comes from the United States (\$6.1 billion in 2002, or double the amount of Canadian investment in the American agri-food-processing industry). Needless to say, the Atlantic region benefits very little from such foreign investment. Rather it tends to be directed to the large-scale production of the Prairies, which supplies the needs of vast international markets, or to urbanized areas of central Canada, which have established a dynamic production capacity in response to the domestic market, a market that is itself close to the large American centres of consumption. Compared with the large-scale crop and animal production of the Prairies and the diversified production of central Canada, the agriculture industry of Atlantic Canada would seem to be relatively unimportant.

However, the positioning of the Atlantic region in Canada as a whole can be misleading. Upon closer examination, it can be seen that not only does the region have a surprisingly diversified sector capable of meeting the competition from domestic and international markets, but it also boasts a varied and dynamic entrepreneurship with strong roots in the community. Moreover, our analyses reveal a relatively good performance by both crop and animal producers and processors, with the latter continuing to broaden their final markets. As well, the sector is relatively integrated from upstream to downstream and has a distribution chain with a strong network at the national and international levels. The sector has also resolutely embraced new technologies and is able to meet the challenges of increased food safety regulations. To sum up, despite its modest appearance, the agri-food

industry is one of the most strategic and highly dynamic sectors in the economy of the Atlantic provinces.

The goal of this study has been to show, among other things, the scope of the agri-food sector in Atlantic Canada and to assess its contribution to the provincial economies. With this in mind, the data and analyses have been revealing to say the least. Agriculture alone accounts for more than twelve thousand agricultural operations (including ninety-five hundred crop and animal farms) that in recent years have generated receipts in the order of \$1.3 billion and provided jobs in which more than 27,300 people earn the majority of their income — income that in 2001 totalled \$495 million.

The scope of this first link in the agri-food chain extends well beyond this, supplying a food-processing industry comprising over five hundred businesses that range from small operations specializing in local products to vertically integrated multinational companies and including cooperative groups and medium-sized family businesses with solid roots in the community. However, regardless of their size, status, or field of activity, they all contribute to the rapid growth in sales of agri-food products, which reach \$3 billion annually. Moreover, an increasing share of these sales is made on international markets: 22 percent of processed production was exported in 2002, compared with 7 percent ten years earlier. The region now exceeds the national average in this regard. In addition, the agri-food processing-manufacturing component, which includes beverage manufacturing, directly employs seventeen thousand people, whose employment income, based on the 2001 census, reached \$497 billion.

On balance, the agri-food sectoral bases (agriculture and the processing of agricultural products, including beverages) directly employ 44,380 people in Atlantic Canada and generate \$991 million in employment income. In 2001, taking into account the induced effects, that is, jobs and income generated in other economic sectors due to the presence of agricultural and agri-food activity, the region benefited from no fewer than 79,650 jobs, or an estimated \$1.77 billion in employment income. This represents 12 percent of the regional workforce, a contribution which is all the more important because much of the work is carried out in rural and semirural areas, which account for 63 percent of the jobs in this sector. In light of this information, no one would deny that the agri-food sector is a highly strategic segment of the economy of the Atlantic provinces.

Our approach was aimed not only at defining the agricultural field and measuring its scope but also at better understanding its dynamic, assessing its performance, and specifying its needs — all with a view to strengthening its foundations and enhancing its profile. Both the qualitative and quantitative data gathered for this purpose have allowed us to identify not just the strengths and potential of the agri-food industry in general but also the constraints it faces.

Beyond the socio-economic framework, the present study has revealed many indicators that attest to the real capacity for adaptation of the regional agricultural and agri-food bases in a rapidly changing world. The agri-food field is shaped by change: new trends in consumption patterns; the appearance of new production technologies, particularly biotechnologies; consolidation of marketing chains with the concentration of intermediaries and large distribution; and the rapid development of quality and control policies (health safety, traceability, environmental protection). These trends as well as many others induce profound changes in the management of businesses, which must display innovation from start to finish while tightening relations with their suppliers and customer-purchasers. At the end of the day, however, it is the consumers who are in charge. Their expectations and preferences dictate the course of action taken by producers and processors alike, making supply planning more challenging. On the other hand, they are creating new prospects which thus far regional producers seem to have been exploiting quite skillfully, as confirmed by their expanded value-added production and greater propensity to export. The export orientation of the region is indicated just as much by domestic flows (interprovincial) and by what should be called import substitution. Indeed, the four Atlantic provinces sell approximately \$1 billion worth of agricultural and agri-food products annually on the Canadian market (outside their respective borders), that is, more than the value of international exports. These, then, are two conclusive aspects of the dynamism inherent in the agri-food sector of the Atlantic provinces.

As the present study has indicated, however, performance on the export market does not tell the whole story. It cannot explain, for example, the relative vitality of the specific segments that make up the agri-food field. One of the comments made by stakeholders in the region criticized the lack of attention paid by governments to certain agricultural branches; another concerned the inadequacy of programs aimed at marketing and value added in certain lesser known

market niches. Based on these and other observations, it is clear that the world of agriculture is marked by a high level of heterogeneity and that the needs and potential of a given sector do not necessarily correspond to those of the entire industry. Therefore, in addition to identifying the trends that are shaping the agri-food world as a whole, our aim in this study was to profile individual sectors, assess their relative performance, and highlight the challenges and issues they face.

It was seen that the agricultural and agri-food industry in Atlantic Canada has followed the national and international trend towards the consolidation of operations. In the agricultural field, the industry is seeking the advantages of size in order to cope with stagnating farm prices for basic products and the continuous increase in production costs. At the same time, the trend towards concentration, which affects both supply and market shares, affords some control over production costs while guaranteeing customer-purchasers a steady supply of high-quality products at affordable prices. Thus, despite the continuous decrease in the number of farms, the area under crops has been maintained, allowing producers to achieve economies of scale. In addition to the effects of agglomeration, modern production and management techniques are being introduced, such as more resistant and fast-growing species. This will allow regional producers to reach production levels that are high enough to make their operations profitable while at the same time ensuring the growth of their capital stock. On this latter point, increasing receipts in several branches of crop and animal production in Atlantic Canada have led to the substantial reinvestment needed to maintain the sectoral bases. Thus, during the 1992–2003 period, receipts from crop and animal production grew more rapidly in New Brunswick and Prince Edward Island (3.5 percent annual growth in real terms) than in the country as a whole (2.7 percent). However, this has not prevented the debt ratio from increasing, which overall is much higher than the national average. On the other hand, the profitability of farms in Atlantic Canada, as measured by their return on assets (income before taxes divided by average total assets), compares favourably with the corresponding data for all of Canada.

In short, despite being smaller on average than those in Canada as a whole, primary agricultural operations in Atlantic Canada earn very satisfactory financial returns. Undoubtedly, this explains the steady level of investment made in them during recent years, the average investment per operation in Atlantic Canada having exceeded the national value between 1999 and 2001.

The Atlantic region has over five hundred businesses engaged in the processing-manufacturing of agri-food products, although a quarter of them have no employees. These businesses are most highly concentrated in a few sectors, such as bakeries-pastries, dairy products, meats, fruits and vegetables (including specialty foods), and beverages. With the exception of potato-processing businesses, food businesses in the Atlantic provinces are relatively small. On the whole, however, their structure varies little from the national profile, except that medium- and large-sized agri-food businesses (two hundred or more employees) are better represented in the Atlantic region than nationally (4.4 percent of the sector's businesses versus 3.7 percent in Canada).

Like farms and other primary agricultural operations, the agri-food-processing businesses in Atlantic Canada earn highly respectable returns, in many cases better than those at the national level. For example, the gross profit ratio in Atlantic Canada's processing sector remained in the 28 to 30 percent range in the 1990s, while the national average hovered around 25 percent. This performance is undoubtedly attributable to the high returns in the vegetable (potato processing in particular) and dairy product sectors. However, the region still reports a productivity gap with the rest of Canada in these sectors, a difference that is nevertheless small given the wage gap between the Atlantic provinces and the rest of Canada. Within the regional economy the agri-food-processing sector performs quite well, even in terms of productivity where it is ahead of the entire manufacturing industry. It is true, however, that the low productivity in the fish-processing sector tends to lower the average for the entire manufacturing sector. When we consider all the indicators combined, the performance measures of the agri-food-processing sector in Atlantic Canada are rather good. While available raw materials at relatively low cost partly explains this performance (with the exception of meat and poultry processors), the capacity of regional businesses to adapt should not be underestimated. Not only have they adjusted their operations to satisfy the demands of new regulations, but they have also met the expectations of large companies, which are, in many cases, their clients or partners. They have also been able to further diversify and develop their production. In fact, value added in relation to shipments of agri-food products continues to increase and was an average of 38.2 percent in Atlantic Canada during the 1992 to 2001 period, compared with 33.6 percent nationally. Of course, this increasing share of higher-valued production is destined mainly for export markets.

Above all, it is the export sector that attests to the dynamism of the agri-food industry in the Atlantic provinces. The upsurge in exports of regional agri-food products, the value of which has more than tripled in the space of ten years (1992–2003), is an indication of how successful the region's producers and manufacturers have been in the wake of the implementation of the North American Free Trade Agreement. Indeed, the proportion of export sales (outside Canada) rose from 11 percent in 1993 to nearly 27 percent in 2002, outstripping even the Canadian rate. Moreover, the increase in exports shows that regional producers have managed to take advantage of new developments in the industry, particularly the high demand for various food products. Thus, sales are constantly increasing in innovative segments such as yogurts and cheeses, creams, ready-to-serve meals, pastas, fruit juices, confectioneries, and beer and wine. Similarly, a trend towards a higher value added has been noted in the horticulture, meat, poultry, pastas, and bakeries-pastry sectors.

Although our analyses reveal that the agri-food industry in the Atlantic provinces enjoys good returns and overall is in a truly dynamic state, various actors in the community pointed out the many challenges it faces. They generally revolve around the following issues:

Access to venture capital. For a long time, investment in the region's agri-food sector relied on a few key sectors, in particular potato processing, dairy products, and poultry. Then in the 1990s, in response to the segmentation of demand resulting from the changing tastes and needs of consumers, a myriad of different-sized, but generally small, businesses specializing in various productions were launched. Today, the array of food products produced in Atlantic Canada continues to expand through the work not only of traditional players that are in the process of diversifying but also of a growing number of new producers who are attempting to position themselves in niche markets. However, these newcomers need venture capital, and that tends to be a rare commodity in Atlantic Canada. Gaining access to traditional sources of funding is particularly difficult for small businesses, whose projects are seen as too risky or too small to justify the administrative costs. And if they do obtain the funds they seek, they must, in compensation, satisfy requirements with regard to eligibility and guarantees that are, to say the least, constraining. It is clear, according to industry stakeholders, that access to adequate, private, and institutional sources of funding remains one of the primary conditions for releasing the innovative spirit of the agri-food sector. And yet the

consensus is that given the physical and environmental constraints imposed on traditional mass productions, the many regional producers have the long-term potential to perpetuate the agri-food sector as a whole.

Succession planning and strengthening skills. We often see reports and releases lamenting the state of agriculture in Canada — stories of abandoned farms and of aging farmers with no one to take their place. Indeed it is important for agriculture to have a line of succession, for the old to be able to give way to the young, not only to maintain production volumes but also to provide the industry with a solid innovative base. The subject of innovation and its strategic importance to agriculture have already been discussed. They were examined in relation to refining new processes (and developing and marketing new products) and to productivity.

It is generally agreed that the future of the agri-food industry in Atlantic Canada as elsewhere lies above all in its capacity to innovate and to enhance its competitiveness. Market globalization, accompanied by increased competition, has forced businesses to adopt new management methods. This trend has intensified because of changing and more complex regulations brought on by repeated crises in the industry, crises that have shaken consumer confidence in large-scale food production.

As a result of these changes and the effects of the computer revolution, the agriculture and agri-food sector has evolved rapidly towards an increasingly knowledge-based industry — to the extent that the reactive capacity of agricultural operators and processors, both small and large, no longer depends solely on the scale of production. Now they must rely on varied and often specialized knowledge, particularly in the management field. It is known that successful businesses are those that use a wide range of management skills. Our discussions with many actors have led us to believe that Atlantic Canada is facing a serious problem of succession planning, both on farms and in processing businesses. The problem is particularly evident in places where businesses are operated intensively or are concentrated in a small area and must therefore engage in a fierce competition for skills.

Continuing education is one way to raise the average level of knowledge in the industry while relying on specific management needs. Combined with regional know-how, continuing education can only improve the management capacities of small businesses. More

training is also necessary for the employees of processing businesses who would benefit from programs on the acquisition of adapted skills. However, this is not a solution that will meet the pressing need for skills by a growing number of businesses in a wide variety of sectors. Only adequate institutional support (training adapted to the specific needs of the regional industry) and improved hiring conditions will make it possible for the agricultural field to recruit its fair share of skills. Nevertheless, the industry should clearly define its needs jointly with the training institutions. Finally, the agri-food-processing sector should be promoted as a field that offers attractive jobs and good prospects for promising careers.

The challenges of innovation. The agri-food field in Atlantic Canada enjoys an extensive research and development network and a regulatory and food safety framework. The region has four federal research centres (Agriculture and Agri-Food Canada), two experimental farms, an agricultural college, two accredited food technology centres, and several food inspection laboratories. In addition to this infrastructure, there are university research units as well as several businesses with the capacity to conduct private research. Even with this support, however, the existing infrastructure is still inadequate to meet the often specific R & D needs of investors and producers.

The present study has emphasized the importance of innovation to agricultural and agri-food businesses. Although valuable studies are conducted in the region by the above-mentioned institutions, in many cases producing significant results, innovation implies a much broader field of application. Whether *offensive* (to stand out from competition) or *defensive* (in anticipation of market-related risks), in nature, innovation within regional businesses is fuelled most importantly by industry suppliers (material, ingredients, measuring-controlling instruments, specialized services) and by customer-purchasers, whose orders dictate size, packaging, and other product characteristics. In short, innovations may involve new or markedly improved goods and services (product innovation), manufacturing techniques (process innovation), or even organization or management methods. From this perspective, it seems obvious that the institutional network described above plays a key, but nevertheless complementary, role in meeting the needs and challenges of crop and animal producers and processors. Certainly, innovative capacity itself depends upon a whole set of factors, including the presence of infrastructures and services that specialize in the technical and financial, management,

and marketing fields. Still, it is necessary to create a better synergy between fundamental research and the needs of the region's industries. Small agri-food businesses can innovate in many ways, but few actually carry out research and development activities internally, nor do many adequately integrate new technologies arising from the work of the region's research centres. Thus, there should be greater collaboration between partners at the regional level in order to maximize research and development efforts in the agri-food sector with the aim of stimulating more innovations within small- and medium-sized businesses.

The themes touched on above are far from exhaustive. Other equally important challenges concern supervision and support in a context of strengthened regulations and trade agreements. While opening up new prospects, however, they also make regional producers more vulnerable (particularly those involved in supply management). Another issue relates to the development of an integrated approach (systems approach) that would allow the various segments with common or complementary interests to share challenges and opportunities. To this end, it would be in the interest of the many agri-food actors in the Atlantic provinces to adopt the approach followed in Quebec since 1992 and meet periodically for what is commonly referred to as a *sectoral round table* or *systems round table*. These consultative structures are intended to inform participants from different settings, including institutional partners, about their mutual interdependence and the benefits of participating in such consultations.

Finally, the present study has emphasized the importance of foreign markets to Atlantic Canada's agri-food industry. It is clear that although the regional market can serve as a springboard for many small regional businesses, it cannot absorb the industry's entire food production. Hence the importance attached to international markets by processing businesses and by the two levels of government, both of which have established targeted programs to promote sales outside Canada — a strategy that seems to be producing positive results.

Having said that, we have also demonstrated the importance of the Canadian market to Atlantic Canada's agri-food products. Sales in Canada of agri-food products reached \$73.5 billion in 2001 (excluding \$26.5 billion in export sales). A substantial share (\$19 billion) of these sales was filled by imports, which means that in 2001 Canadian producers sold \$54.5 billion worth of agricultural and agri-food products

on the domestic market. Indeed, a significant share of production in Atlantic Canada is destined for the Canadian market, particularly to the large urban centres of Montreal, Toronto, and Ottawa. In a province such as New Brunswick, for example, the trade balance of agri-food products is higher at the national than the international level. The future prospects of the Canadian market are good, in particular for products aimed at ethnic minorities, for functional or nutritional foods, and for fresh fruits and vegetables. It is in its own best interest for the agri-food industry in Atlantic Canada to develop its linkages with the large distributors on the Canadian market. As well, import substitution is beneficial for the region as a whole and would make it possible to maximize the industry's regional economic spin-offs.

We will conclude this analysis by considering to the potential impact on the industry of the Federal-Provincial-Territorial Framework Agreement on Agricultural and Agri-Food Policy for the Twenty-First Century. The aim of this agreement, which includes five components (risk management, environmental stewardship, food safety and quality, innovation, and renewal), is to promote the adaptation of the Canadian agricultural industry to new standards of food safety and environmental protection. This fits naturally into the expected opening of trade in agri-food products under the aegis of the World Trade Organization. Of the five elements of the strategic framework, it is clear that risk management is the industry's main concern in Atlantic Canada. We have seen that for a number of years, the share of revenue in the form of transfers received by the region's crop and animal producers has been lower than the national average. Nevertheless, the new risk-sharing formula should not be a further disadvantage. Another concern is that the sectors whose operations are based on supply management could experience problems arising from the elimination (or substantial reduction) of tariff barriers unless measures are taken to adapt these sectors to the new competitive conditions. As a party to the discussions about the strategic framework, the agri-food industry in Atlantic Canada must be vigorous in promoting its interests, many of which differ from those of other Canadian regions.

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