OVERVIEW OF AGRICULTURE STRUCTURAL PARAMETERS FOR CANADA

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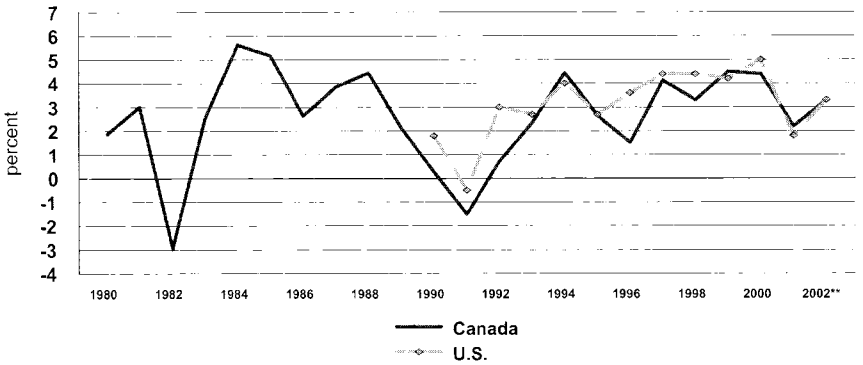
INTRODUCTION

Before analyzing the impact of the North American Free Trade Agreement (NAFTA), it is important to have an understanding of the structure of the Canadian agri-food sector and the pressures that are driving recent structural changes. The purpose of this paper is to present background information and data describing the current structure of the Canadian agri-food sector. The paper begins with a brief discussion of developments on the macroeconomic, trade and domestic agricultural policy fronts that have influenced the sector's structure since 1980. A brief description of the technological advances and consumer attitudes that are impacting the structure of the sector follow in the third and fourth sections. Then a structural overview of the agri-food sector follows, including a description of the farm input, primary, food processing and distribution sectors. The paper provides a summary including comments about the impact NAFTA has had, and will continue to have on agri-food sector structure.

Figure 1: Economic Growth in Canada and the U.S., 1980 to 2002*.



Source: Statistics Canada, National Income and Expenditure Accounts, Bureau of Economic Analysis, Survey of Current Business

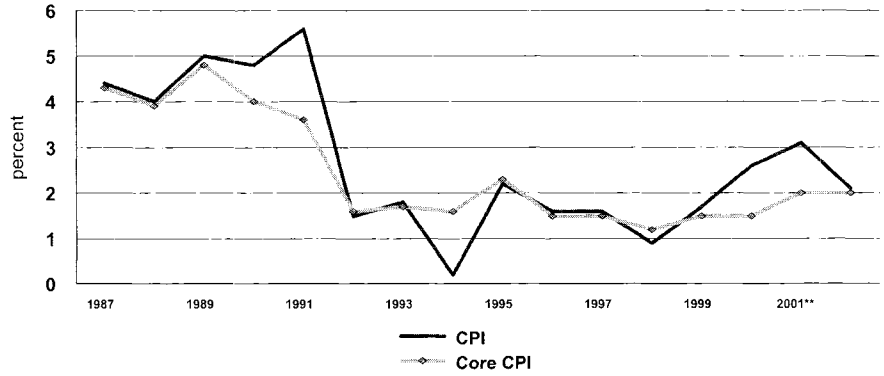
* measured by annual percent change in Real Gross Domestic Product: Canada (constant 1992 dollars) U.S. (constant 1996 dollars) Forecast July 2001 by TD Bank

POLICY ENVIRONMENT

Macroeconomic Policy Environment

Throughout the 1990s, Canada, like the United States, experienced almost a decade of unprecedented economic growth in an environment of low inflation, increased productivity, falling unemployment rates and stable interest rates (Figure 1). After the stagflation of the 1970s, restrictive monetary policies in the 1980s brought inflation under control and resulted in significant restructuring of the North American economy (Figure 2). In addition, policies aimed at reducing government budgetary deficits at both the federal and provincial levels in Canada and in the United States meant lower government spending throughout the mid 1990s. Fiscal restraint resulted in government surpluses by 1999 (Figure 3) when governments were able to lower tax rates and work on reducing government debt. Since the early 1990s, the creation of the knowledge-based economy including the rapid expansion of computer technology and the more recent introduction of the Internet and e-commerce contributed to significant economic restructuring. At the same time, North American stock markets boomed, resulting in real gains in consumer wealth until corrections took place in early 2001.

Figure 2: Inflation in Canada, 1987 to 2001*.

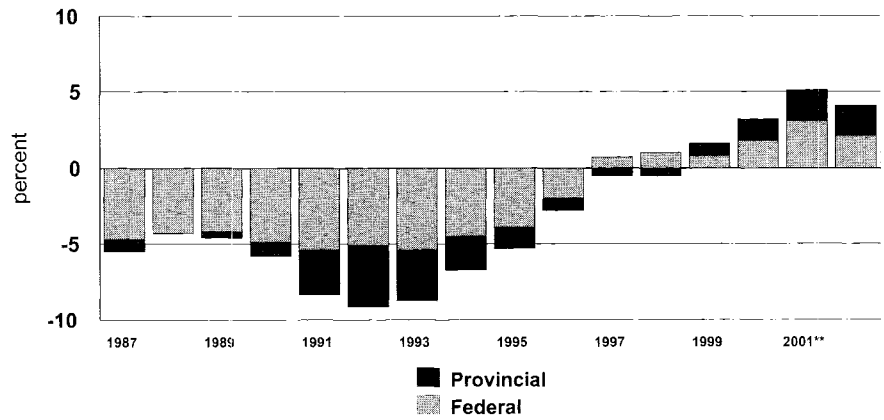


Source: Bank of Canada, Toronto Dominion Bank

*Inflation is measured by the percentage change in the Conumer Price Index (CPI). Core Inflation is measured by the percentage change in CPI excluding food and energy (1992 = 100).

**Projections made by the Toronto Dominion Bank, Quarterly Economic Updates, July 2001

Figure 3: Federal and Provincial Government Surplus/Deficit as a Percent of GDP, Canada, 1987 to 2000.

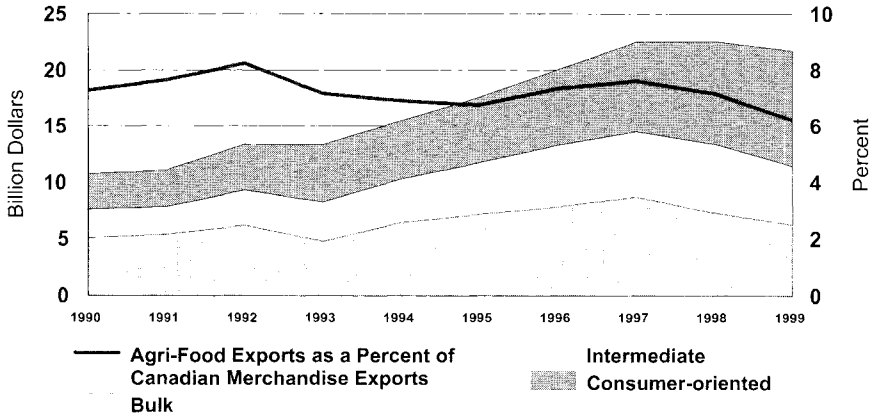


Source: Bank of Canada Review, August 16, 2001

Trade Policy Environment

Since 1988, significant changes in the trade policy environment affected the structure of the agri-food sector. First of all, Canada benefitted from the Canada–U.S. Free Trade Agreement, signed in 1988, which lowered tariffs

Figure 4: Growth in Agri-food Exports, Canada, 1990 to 1999.



Source: Statistics Canada, Merchandise Trade Database

and removed barriers to trade between Canada and the United States, Canada's most important trading partner. The Dispute Settlement Mechanism, an important component introduced at this time, has helped arbitrate trade disputes, particularly before countervail and trade sanctions can be enforced.

The signing of the North American Free Trade Agreement (NAFTA) in 1994 further extended the liberalized trading area to include Mexico, with its market of an additional 100 million people. NAFTA was soon followed by the signing of the World Trade Organization (WTO) Agreement in late 1994 which introduced further trade disciplines on agricultural support, improved market access, and attempted to end agricultural (export) subsidy wars. The resulting increase in trade and market access for Canadian agri-food participants resulted in increased competitiveness of the industry in global markets. Figure 4 shows how Canadian agriculture and agri-food exports increased over the period 1990 to 1999 and the breakdown between bulk and consumer-oriented products.

Domestic Agricultural Policy Environment

Partly in response to developments in the trade policy environment and partly in response to government fiscal restraints, major revisions to Canadian agricultural policy changed the focus of farm programs over the 1990s. Federal

support to agriculture is delivered through five safety net programs that fall under the *Farm Income Protection Act* (FIPA). This Act (FIPA), introduced in 1991, encouraged a more "market-oriented" and "self-reliant" philosophy that was at the same time intended to be trade-and production-neutral (decoupled), equitable across provinces and environmentally sustainable with minimum administrative overlap or duplication. Labeled a "whole farm approach", FIPA governs programs that stabilize income from all commodities rather than on a commodity by commodity-basis. Funding for safety nets is negotiated between the federal and provincial governments every three years and outlined in a federal/provincial Safety Net Agreement Framework. The objectives of safety net programs, as stated in the most recent Safety Net Agreement Framework (July 2000), include "encouraging risk management by producers" and "stabilizing income" (Richardson, 2000). The five safety net programs include:

- Net Income Stabilization Account (NISA)
- Crop Insurance
- Provincial Companion programs
- Cash advance programs, and
- Agriculture Income Disaster Assistance (AIDA) / Canadian Farm Income Program (CFIP)

The ***Net Income Stabilization Account*** (NISA), helps producers achieve long-term farm income stability on an individual basis. Producers deposit money annually into NISA accounts and receive matching government contributions. In lower income years, producers can make withdrawals from the funds they have set aside. Withdrawals are triggered when gross margins fall below a three-year average (gross margin trigger) or when family income falls below a minimum family income level (minimum income trigger) (Gellner and Rattray, 2001). NISA covers most commodities except those participating in supply management systems such as chicken, turkey, eggs and fluid and industrial milk, and those produced in Quebec. Federal and provincial expenditures of $230 million were spent on NISA in the 2000-01 fiscal year.

Crop Insurance is a provincially-delivered program to which the federal government contributes, on a cost-shared basis, according to FIPA guidelines. Producers, provincial governments and the federal government contribute to premiums and administrative costs in insuring crops against natural haz-

ards such as drought, flood, hail, frost, excessive moisture and insects. Payments are triggered when a producer's yield falls below 70 to 80 percent of the farm's average historical yield. Crop Insurance is a voluntary program that covers most crops across the country. In 2000-01, $223 million net of premiums was spent on crop insurance.

Provincial Companion Programs provide safety net funding to the provinces to design programs that address unique provincial differences in agricultural structure. A wide gamut of programs are funded under this program. In fiscal year 2000-01, $192 million were spent on companion programs.

The purpose of the fall ***cash advance payments programs*** (APP) is to improve producers' marketing of eligible crops by providing them with cash advances of up to $250,000 on their stored crops after harvest so they can market their crops later in the season when market conditions result in better prices. The first $50,000 of cash advances is interest-free and loans are repaid as the crops are marketed. The ***spring cash advance program*** **(SCAP)**, on the other hand, introduced in March of 2000, provides interest-free loans to eligible crop producers to help with spring seeding. In 2000-01, $39 million were allocated to cash advances by the federal government, primarily to cover the interest costs of these loans.

With the dramatic decline in hog and grain prices in 1998 and 1999, a federal/provincial cost-shared program was introduced called the ***Agriculture Income Disaster Assistance*** (AIDA) program, to provide disaster relief. This program was initially funded for two years and was similar to disaster programs already in place in British Columbia, Alberta, and Prince Edward Island. Under AIDA, producers were compensated for up to 70 percent of their previous (three-year or middle three out of five year) average gross margin if the gross margin for the current year fell below this average. AIDA was designed to be integrated with NISA in many provinces in an effort to eliminate duplication of payments. Federal funding for AIDA was $196 million in 2000. AIDA was replaced by the ***Canadian Farm Income Program*** (CFIP) in July 2000, a second generation disaster program that works on the same principals as AIDA. Minor adjustments were made to the program such as better integration with

NISA and the inclusion of all labour (family and non-family) costs as an allowable expense.

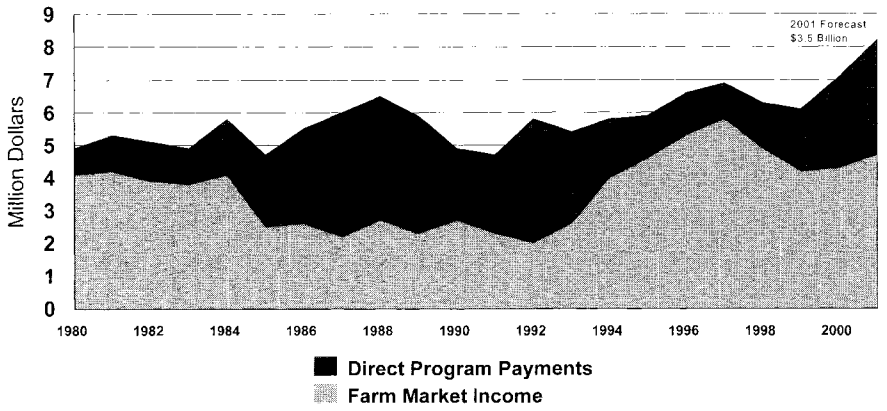
As a result of these programs under the federal/provincial Safety Net Agreement Framework, federal and provincial government expenditures on safety net programs rose to $2.6 billion in 2001 from $1.1 billion in 1997.

Other Agricultural Policy Changes

Another important policy change that impacted the structure of the western grain sector in particular was the termination of the Crow Rate transportation subsidy in 1995. This subsidy, worth $650 million in 1994/95, had been in place since the late 1890s when the Canadian Pacific Railway agreed to reduce freight rates on "settlers' effects and grain and flour, in return for a federal subsidy and significant land grants to build a rail line through the Crow's Nest Pass (Skogstad, 1987). The subsidy was important for encouraging the development of grain and oilseed production on the Prairies since rail costs would have been higher without it. Upon its termination, prairie producers were granted a one-time Western Grain Transition Payment of $1.6 billion to compensate for the expected impact on land values. As a result of its termination, the cost of transporting grains off the prairies increased, particularly from eastern Saskatchewan and western Manitoba. This resulted in significant restructuring away from grains towards more livestock production, particularly hog production in Manitoba, given that it made more sense to export grains in the form of livestock at higher transportation rates.

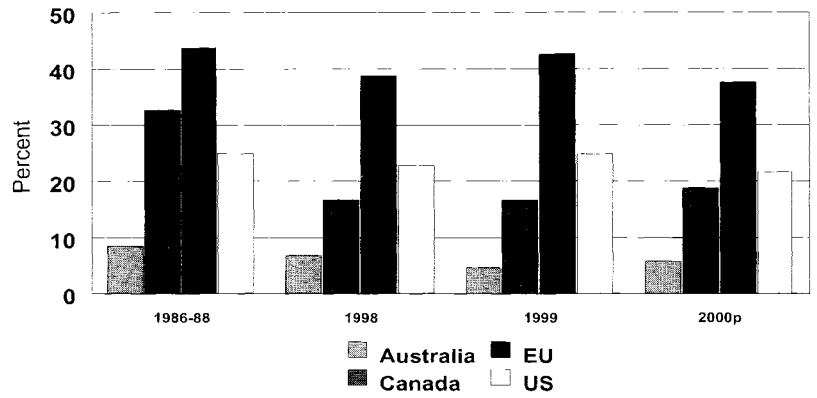
As a result of the introduction of the *Farm Income Protection Act* in 1991 and the evolution of the various agricultural support programs discussed above, along with program review, deficit reduction and the termination of the Crow Rate in 1995, direct support to agriculture declined between 1991 to 1997 (Figure 5). Three years of record high world grain prices from 1995 to 1997 eased the pain of program reductions for grain and oilseed farmers on the Prairies in particular. However, once grain and hog prices fell in 1998, continuing the long-run downward trend in commodity prices, real pressures arose to introduce new, more generous income support programs, and direct program payments increased again in 1999 and 2000.

Figure 5: Net Cash Income and Direct Program Payments, Canada, 1989 to 2001*.



* 2001 is forecast as of June 2001.
Source: Statistics Canada and Agriculture and Agri-Food Canada

Figure 6: Producer Subsidy Equivalents (PSEs) by Country, 1988-1989 to 2000*.



2000* is provisional
PSEs measure all types of support as a % of value of production
Source: OECD, Monitoring and Evaluation 2001

Agriculture Support Relative to Other Countries

Compared to many other countries, Canada provides less overall aggregate support to its farmers. Figure 6 shows the relative Producer Subsidy Equivalents (PSEs) for several countries in the Organization for Economic

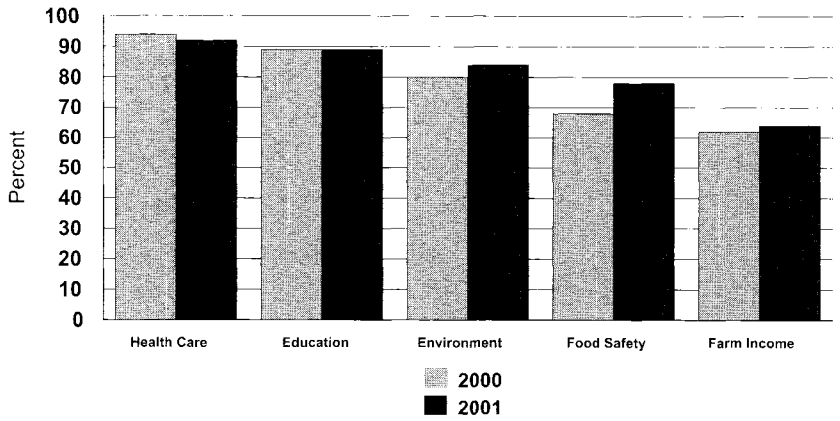
Cooperation and Development (OECD). PSEs measure both direct income support, as discussed above, and Market Price Support, such as that provided by import restrictions and domestic supply management regulations. Based on this information, Canada has reduced its levels of support from the average of 1986 to 1988, while countries such as the United States and the European Union have increased their support over this period. It is argued that because of this higher support, world prices for wheat, for example, are lower than they otherwise would be. Consequently, there is considerable pressure from Canadian farm lobby groups to raise the level of support in Canada as well.

TECHNOLOGICAL ADVANCES

The agriculture sector has made tremendous progress and considerable technological advances during the 1900s. It has gone from an industry that was basically subsistence farming, heavily reliant on family labour and horse power, to an industry using $300,000 combines and a fraction of the labour used even a generation ago. It is now on the leading edge of biotechnology and animal genetics, and butting a wall of resistance to these revolutionizing technological advances. Issues related to intellectual property rights and science ethics now play a important role in the industry and may shape further developments.

The technological advances in the post-war period related to mechanization and improvements in plant production techniques have contributed to historically unprecedented productivity growth. Productivity increased by just under 2 percent a year during the 1970s and over 2 percent a year during the 1980s and 1990s (Quarterly Agri-food Trade Highlights, 1999). Computer technology and the Internet, air seeders for zero-till production, precision farming with Geographic Positioning Systems (GPS) and new genetically modified crops (GMOs) will contribute to further improvements in agricultural productivity in the years ahead. New techniques are also being developed to make non-food uses of agricultural products such as biofuels (ethanol), nutraceuticals, construction materials made from biomass, and functional foods. These improvements will no doubt lead to further changes in the structure of the agriculture and agri-food sector.

Figure 7: Survey of Citizens' Concerns, 2000 and 2001.

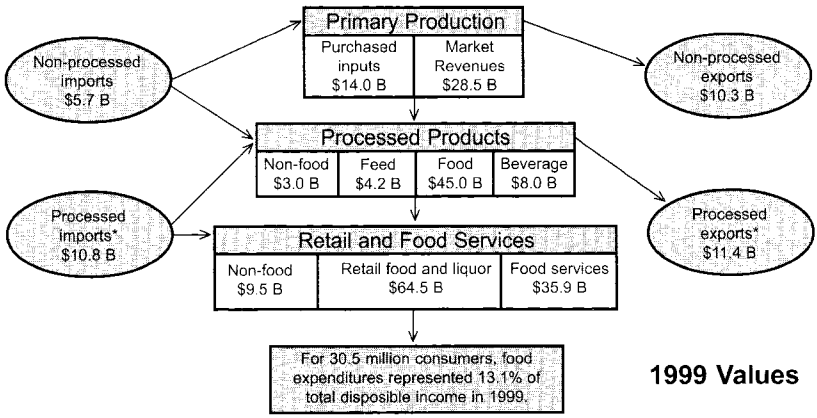


Source: Eckos, 2000, 2001

CONSUMER ATTITUDES

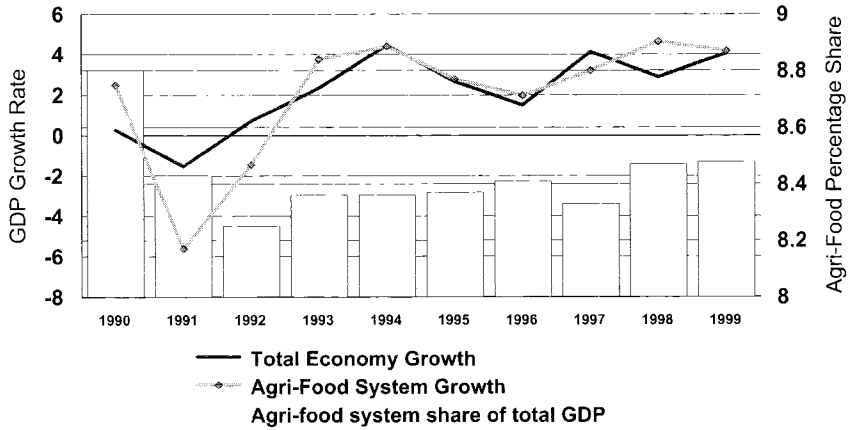
Over the 1990s and perhaps culminating in the WTO talks in Seattle in December 2000, we have seen the rise of "consumer sovereignty". Consumers speak loudly and their voices are being heard on several fronts affecting the agri-food sector. For example, they are demanding an increasingly safe food supply and are not particularly open to genetically modified crops. They want an environment that is clean and sustainable and water that is free of contaminants and safe to drink. Recent attitudinal surveys in Canada show that a large percent of consumers consider the environment (84 percent) and food safety (78 percent) a high priority issue (Figure 7). On the marketing front, consumers are demanding food products that are healthy and nutritious but at the same time convenient to prepare or ready to eat. Functional foods which include added health benefits and organically grown food products have seen a tremendous increase in popularity and market share. All these developments will affect the food products that are produced and consumed as well as marketed. These developments in turn will impact the structure of the agriculture and agri-food sector. The next section discusses this structure in some detail.

Figure 8: Agri-food System Overview, 1999.



*Processed imports/exports include a small component of non-food products consisting mainly of manufactured tobacco.
Source: AAFC, Portrait of the Agri-food Sector

Figure 9: Growth and Importance of the Agri-food Sector, Canada, 1990 to 1999.



Source: Statistics Canada, CANSIM Matrix 4677
Note: The agri-food sector includes the primary agriculture sector and related service industries, the food and beverage processing sector, the food and beverage distribution sector (wholesale and retail) and the food service sector.

THE STRUCTURE OF THE CANADIAN AGRI-FOOD SECTOR

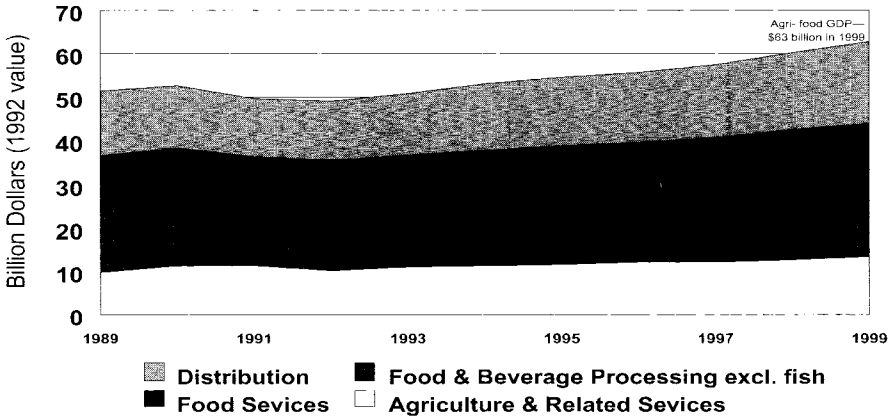
The agri-food sector is a dynamic 110 billion dollar industry, employing one in seven Canadians and making a significant contribution to Canada's trade balance and domestic economic growth and activity. Figure 8 shows the values of each of the various components of the agri-food sector from the farm input sector to the food service and retailing industries. As seen in Figure 8, the farm input sector, worth $14.0 billion in sales in 1999, was important for contributing to the primary agriculture sector's $28.5 billion in farm cash receipts. While $10.3 billion of this primary production was exported, the remaining $18.5 billion was further processed into food and beverage and non-food and feed products. After processed exports of $11.4 billion and imports of S10.8 billion, domestically-processed products and imports contributed to $64.5 billion worth of retail food and beverage sales, $9.5 billion worth of non-food sales and $35.9 billion food service and restaurant sales in 1999.

Importance to the Economy

The agri-food sector, with its various components (farm input, primary agriculture, food and beverage (and increasingly non-food) processing, food retailing and food service sectors) is an important contributor to the Canadian economy, employing one in seven Canadians and accounting for 8.5 percent of Canadian total Gross Domestic Product. From 1990 to 1999, the gross domestic product (GDP) of the agri-food sector increased about 4.0 percent a year, with most of the growth occurring after the 1991 recession (Figure 9). By 1999, total GDP of the agri-food sector stood at $63 billion in real terms (1992 dollars), with the primary agriculture sector contributing to 22 percent of this amount, the food and beverage processing sector, 28 percent, and the food retailing and distribution sector accounting for 50 percent of total agri-food GDP (Figure 10).

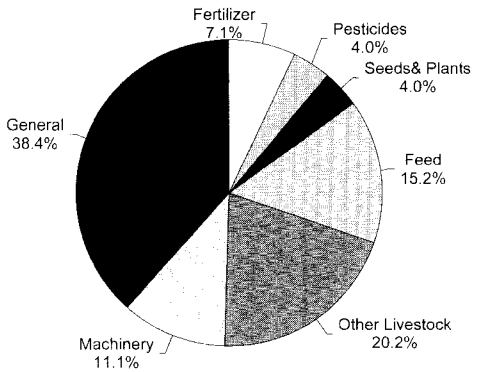
The agri-food sector is also an important contributor to Canada's merchandise trade balance. As mentioned above, Canadian agri-food exports increased substantially over the period 1990 to 1999 to just over $20 billion, to rise to almost 4 percent of world agri-food exports (Figure 4), a goal explicitly set by Agriculture and Agri-Food Canada and the Canadian Agri-food Marketing Council (CAMC) in 1997 (CAMC, 1998). An increasing share of these

Figure 10: Relative Importance of the Various Components of the Agri-food Sector, 1989 to 1999.



Source: Statistics Canada

Figure 11: Relative Importance of Farm Input Expenses, 1996.



* shares are based on the relative importance of operating expenses for the average farm in Canada in 1996
Source: Statistics Canada, Whole Farm Database

exports are consumer-oriented as opposed to bulk, thereby contributing to the value-added and hence the profitability of the food and beverage processing sector. In the following sections, the changes in structure that occurred in each of the components of the agri-food sector will be described in more detail in an

effort to better understand how the NAFTA may have impacted the structure of the agri-food sector over the 1990 to 1999 period.

Farm Input Sector

The farm input sector is composed of several important industries that for the most part are highly concentrated and made up of a small number of large international firms. The farm input sector includes inputs that are required to produce agricultural products - inputs such as feed, seed, fuel, fertilizer, pesticides, machinery and equipment, and labour that contribute to the operating expenses of the farm business. This sector was worth $14 billion in sales in 1999 (Figure 8). Prices for many of these inputs are determined in the global or North American market, with some adjustment to take account of regional market conditions. Much of the research and development takes place outside of Canada reducing the variety of products available in this country relative to others such as the United States.

Figure 11 shows the relative importance of farm input expenses for an average Canadian farm in 1999. General expenses make up the bulk of these costs at 39 percent of the total. These include expenses related to interest costs, custom machine work, and other miscellaneous expenses. However, the other important expenses on farm inputs include feed costs at 15 percent of the total, machinery costs at 11 percent, fertilizer (7 percent), pesticides (4 percent) and seeds and plants (4 percent). The relative importance of these expenses will of course vary by farm type. For example, grain and oilseed farms would allocate a greater share of costs to seeds, fertilizer and pesticides than a cattle farm, which would spend more on feed and the cost of animals. It is on grain and oilseed farms that the productivity improvements of the 1950s and 1960s took place, due to the reduction in labour costs and the increase in machinery and equipment expenses related to new technology.

Pesticides. The world pesticide industry reports sales of about $1.1 billion (U.S. $810 M) with Canadian sales accounting for approximately three percent of the world market. Pesticides are primarily used in the production of field crops, tree fruits and nuts and include herbicides, fungicides and chemical treatments. The industry is quite concentrated in Canada with a small number of large global firms producing for local markets. These firms with branches in

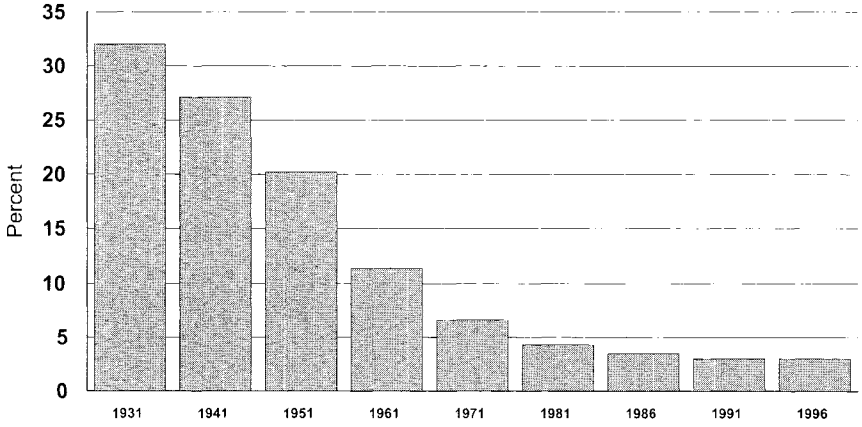
Canada gain regulatory approval by undertaking research based on local conditions. Prices are generally given but can vary based on what the market in a particular region will bear (McEwan and Deen, 1997).

Given the recent improvements in farming practices and the introduction of biotechnology in the area of pest-and herb-resistant plants, the pesticide industry is undergoing changes and this is having an impact on the types and costs of crops being grown. For example, the industry has responded by purchasing seed companies and developing seed products that work optimally with a specific pesticide (e.g. Roundup-ready canola). Canada has higher corporate tax rates and higher costs of registration relative to the United States, Japan and the Economic Union. This will no doubt hamper the development of an industry in Canada and we will continue to rely on multinationals for pesticide supplies.

Farm Machinery. In 1998, Canadian shipments of farm machinery were $2.6 billion with value-added of $1.3 billion. Most of this farm machinery was imported since Canada is a net importer of farm machinery, ($4.6 billion in 1998 compared with exports of $1.1 billion). Imports are large, high-priced items while exports are smaller, lower-priced items. The farm machinery industry in Canada is dominated by a small number of large global firms, with head offices in the United States (John Deere) and Europe(New Holland-Case). The local distributors often base the regional prices on what the market will bear. Some small, regional "short-line" producers are centered in Saskatchewan and Manitoba. Machinery such as tractors, balers, seeders and combines are distributed in this manner. With the increasingly sophisticated farm machinery available and required for no till-techniques, for example, the agriculture sector continues to become more capital intensive. This will continue to have implications for the size and efficiency of the average Canada farm.

Fertilizer. The value of shipments of fertilizer in 1999 was $4 billion. Of this amount, $388 million was imported. However, despite being a small user on world fertilizer markets (2 percent share only), Canada is a net exporter of fertilizers due to its 40 percent share of the global potash trade. The Potash Corporation of Saskatchewan is a global participant and an industry price set-

Figure 12: Share of the Canadian Population Living on Farms, 1931 to 1996.



Source: Statistics Canada, Census of Agriculture

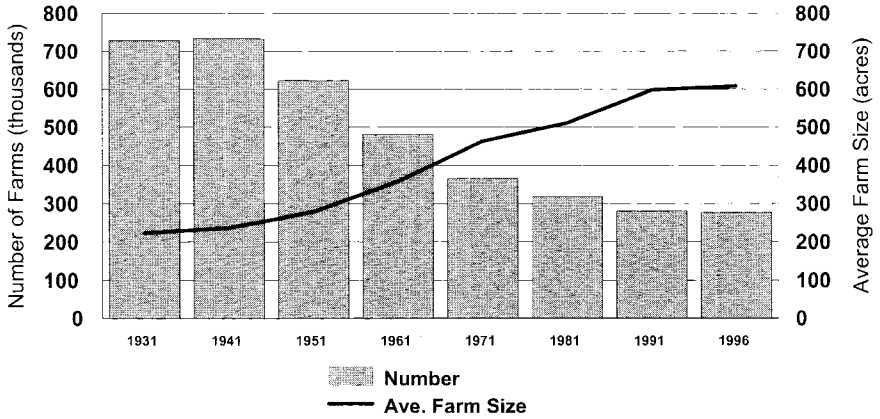
ter. Canadian producers have increased their capacity over the 1990s thereby maintaining a high supply. The open border with the United States allows prices to be set in the continental rather than the local market. With the consolidation of fertilizer companies that is currently taking place, there is a fear that prices will rise as a result (Korol and Rattray, 2000).

Fuel. Canadian farmers require fuel to apply pesticides and fertilizers, to operate all their farm machinery, and to heat their barns and buildings. The fuel industry is dominated by a shrinking number of global firms. Canada is a small user in the global fuel market and is a net exporter of fuel and petroleum products. Prices for farmers vary by province, depending on regional availability and fuel tax rebates and other tax treatments (Canadian Agricultural Energy End-Use Association, 1998).

Primary Agriculture Sector

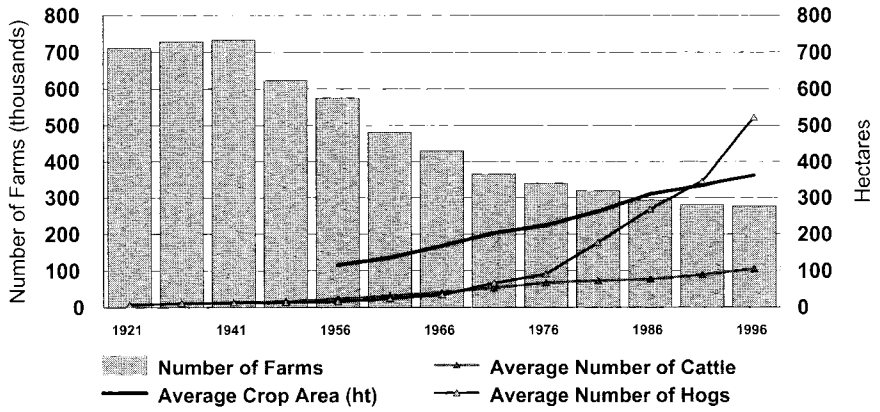
There have been significant changes in the structure of primary agriculture over the past fifty years. While one third of the population lived on farms in 1931 when Canadian society was still fairly agrarian, this share declined to 5 percent in 1981 and just 3 percent by 1996 (Figure 12). This decline

Figure 13: Number of Census Farms and Average Farm Size in Canada, 1931 to 1996.



Source: Statistics Canada, Census of Agriculture

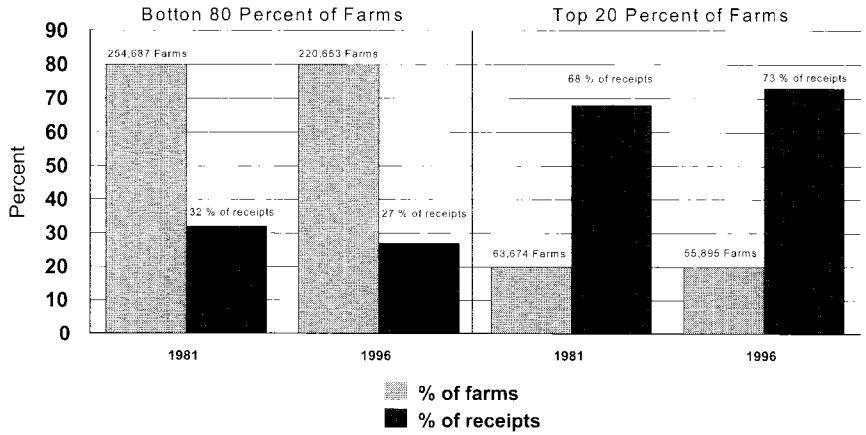
Figure 14: Number of Farms in Canada and Average Crop Area and Herd Size, 1921 to 1996.



*Averages are calculated on per reporting basis for crop area and herd size.
Source: Statistics Canada, Census of Agriculture

occurred primarily because of the decrease in the number of farms from over 700,000 in 1931 to 300,000 in 1981 and 276,000 in 1996 (Figure 13). At the same time, farms have become larger and more efficient as a result of new technologies and the dramatic increases in productivity that has taken place

Figure 15: Concentration of Production, Canada, 1981 and 1996.



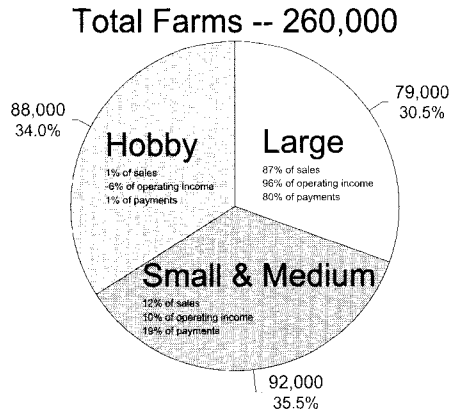
Source: Statistics Canada, Census of Agriculture, 1981 and 1996

since the 1950s (Jones, Freshwater and Fiarchuk, 1995). Many farms became more specialized and more efficient as a result. For example, the average crop area per farm has increased from 100 hectares in 1956 to over 300 in 1996, while the average hog farm has an average herd size of over 500 head, up from under 100 in 1976 (Figure 14).

Canadian agriculture has become increasingly concentrated and polarized with the top 20 percent of farms producing almost 80 percent of production (the 20-80 rule) (Figure 15). This compares with 1981 when the top 20 percent of farms accounted for 68 percent of production. This trend is expected to continue into the future as farms adjust and become more efficient in order to compete in the increasingly competitive globalized world markets. New technology and marketing arrangements are also making this trend towards larger enterprises feasible.

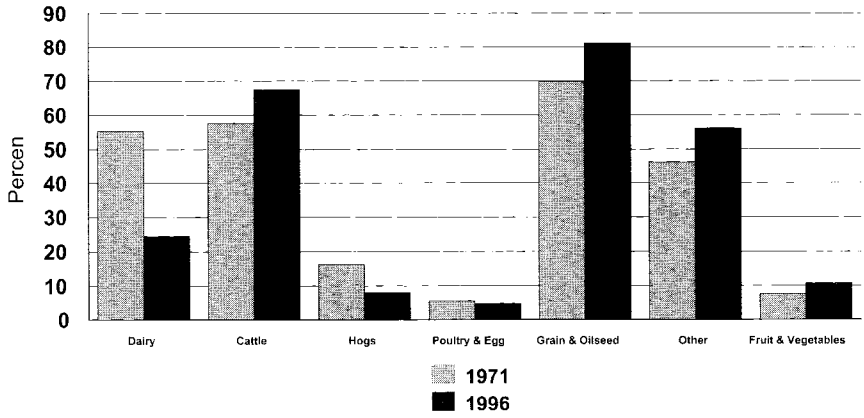
Another way to look at the distribution of farms relative to their contribution to agriculture production is by breaking down farms into three revenue

Figure 16: Distribution of Farms, Production and Program Payments, 1999.



Source: Farm Financial Survey, 1999 AAFC Estimates

Figure 17: Change in Distribution of Farms by Farm Type, Canada, 1971 and 1996.



Source: Statistics Canada, Census of Agriculture

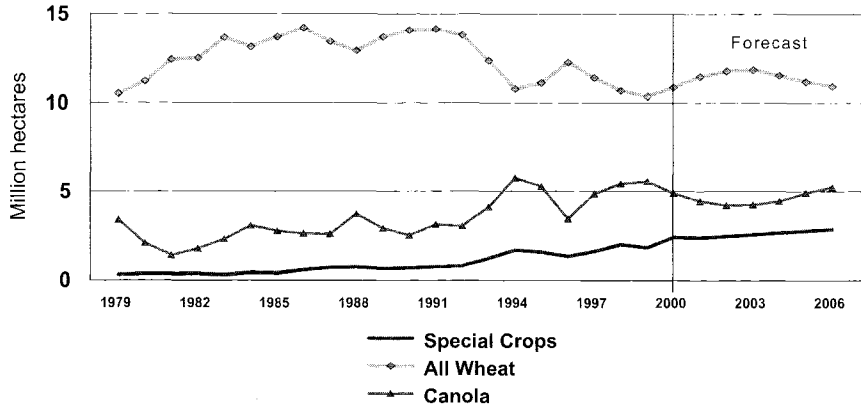
classes. The smallest farms, with gross farm revenues under $10,000, are called hobby farms, and represented 30 percent of farms in 1999. These farms accounted for only 1 percent of agricultural production and 2 percent of net operating income (Figure 16). They received only 1 percent of direct program pay-

ments. Small and medium-sized farms, with revenues between $10,000 and $100,000, represented 35 percent of farms while accounting for only 12 percent of agricultural production. These farms received 19 percent of direct program payments. Large farms, on the other hand, with revenues of $100,000 and over, representing the top 31 percent of farms, accounted for 87 percent of production and received 80 percent of the program payments. These numbers further reinforce the concentration numbers above and show that a relatively small percentage of farms produce the bulk of agricultural production and receive the majority of net operating income and direct program payments in Canada.

Canada is a large country with varying landscapes and as a result, there are significant regional differences in farm types. For example, British Columbia has a higher number of livestock and fruit and vegetable farms. The prairie region produces primarily grains, oilseeds and livestock while the well-populated central part of Canada (Ontario and Quebec) is an area of more mixed farming, particularly in the southern parts of the region. Grains and oilseeds as well as poultry, livestock, and fruit and vegetables are important commodities produced in this region. The Atlantic provinces are known for their potatoes, but also produce dairy and other field crops.

Over time, there has been little change in the type of farms in Canada. Figure 17 shows that between 1971 and 1996, there has been a shift away from dairy and hog farms to an increasing number of cattle, grain and oilseed, fruit and vegetable and other farm types. While Census data are not yet available for 2001, there will no doubt be further changes in the distribution by farm type, size and region from 1996 to 2001 due to recent policy changes and pressures from increased globalization and lower commodity prices. For example, the elimination of the Crow Rate transportation subsidy in 1995 resulted in the expansion of the livestock industry in Manitoba, where transportation rates had increased substantially and made transporting grains in the form of value-added livestock more economical. On the other hand, the termination of feed freight subsidies to Eastern Canada had the opposite effect—one of discouraging livestock production. While hog production in Quebec continues to expand, urban population pressures on livestock producers in Ontario have resulted in a decline in the number of cattle operations in that province. Also on the Prairies,

Figure 18: Area Harvested in Various Crops, Canada, 1979 to 2007*.



*Forecast from 2001 to 2007 is based on AAFC, Medium Term Baseline forecast, October 2000
Source: Statistics Canada, June Crop Survey

the crop mix has changed from primarily traditionally wheat-based to special crops such as chick peas, white beans, lentils, canary seed and other non-traditional crops. Prairie producers, especially those in areas faced with the increase in transportation rates following the elimination of the Crow Rate Subsidy (in Eastern Saskatchewan and Western Manitoba), coupled with record low wheat prices since 1998, diversified out of wheat in an effort to diversify risks and improve their profitability from niche markets and higher value-added crops. This had an impact on the area harvested in various crops, as seen in Figure 18.

At the same time, major changes in marketing arrangements between hog producers and processors, such as production contracts and vertical integration, in combination with new technology and management systems, have resulted in the growth of larger, more efficient hog operations in those regions where hogs were traditionally raised. The average hog herd size in Canada has increased as a result, from 177 head in 1981 to 523 head in 1996. Similarly, increasingly intensive cattle operations (primarily feedlots) in Alberta, have also led to an increase in the average herd size for cattle operations, from 73 head in 1981 to 105 head in 1996. This intensification is having repercussions on the environment as rural and urban neighbours have increasingly expressed

their concerns over the impact these more intensive livestock operations (ILOs) have on nearby air and water quality. Some municipalities have even restricted the size of cattle and hog farms (Tyrchniewicz, Carter and Whitaker, 2000). Several provinces have introduced nutrient management legislation that will regulate large-scale livestock production and its impact on the environment.

An alternative method of considering the distribution of farms that accounts for the diverse needs and behaviour of farmers and their families is the "farm typology" (Niekamp and Zafiriou, 2000). This "farm typology," like that developed by the Economic Research Service (ERS) of the United States Department of Agriculture (ERS, 2000), takes account of such factors as the size, age, business intentions and life cycle that influence the behavior, potential and performance of farms and their operators. For example, some farm operators are close to retirement and in the process of downsizing or preparing for succession. Others are considering expanding and in the process of investing in new capital, and training and skills to become more profitable and efficient. Still others are operating a small farm where they live while working full-time in another profession, simply for lifestyle reasons. A description of the various typologies follows with a discussion of their relative importance (Table 1) and corresponding characteristics (Table 2).

Farms have been divided into four typologies or categories based on size or capacity, life cycle and/or business intentions. *Retirement farms* are those farms operated by farmers over age 60 and receiving pension income, or anyone over age 65 years of age with no second operator that is at least 20 years younger (to account for children in the process of taking over the farm). Farmers in this typology are expected to be downsizing, have significant assets and little debt, and are likely not investing in new technology and equipment. Retirement farms represented 16 percent of farms in Canada.

Lifestyle farms are relatively small farms (gross farm revenues under $50,000) where the main operator and/or family members also earn substantial off-farm income (over $50,000). These farms generally earn little from farming and are not in the process of expanding and/or investing in training and new skills. Lifestyle farms represented only 8 percent of farms in 1999 and accounted for only 1 percent of agricultural output.

Table 1: Distribution of Farms by Farm Typology, Canada, 1999.

Farm Typology	Number of Farms		Market Revenue	Program Payments
	(Actual Number)	(Percent of Total)	(Percent)	(Percent)
Retirement	27,928	16	6	8
Lifestyle	13,601	8	1	2
Low Income	18,885	11	3	4
Business Focussed:				
Small Farms	14,686	9	1	2
Medium Farms	21,632	13	5	7
Large Farms	62,952	37	42	52
Very Large Farms	10,521	6	39	23
Hutterite Colonies, etc.	514	0	2	2
Total	179,719	100	100	100

Source: Farm Financial Survey, 1999.

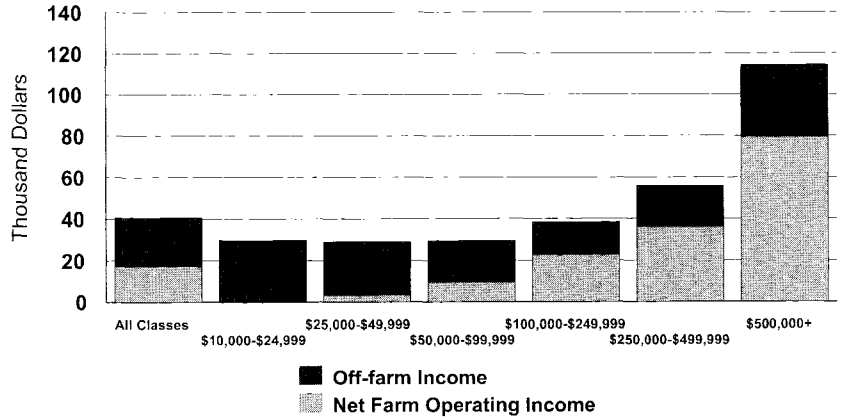
Low income farms account for farms with low family income (under $20,000 per family) which are also not retirement or lifestyle farms. Generally operators on this group of small farms (under $50,000 in revenues) earn little from farming or from off-farm sources. This may be because they are not close to employment centres where they might find off-farm jobs, they may operate only marginal land or may not have the appropriate skills to do well in farming or in off-farm employment. Generally, operators on these farms receive little from agricultural safety net programs (4 percent, Table 1) and do not have access to more general social safety nets (eg. Employment Insurance, Welfare) because they are too asset-rich. They are considered the rural poor. In 1999, 11 percent of farms were considered low income farms.

Business-focused farms include farms not in the other three typologies (i.e. retirement, low income or lifestyle). Operators on these farms may be more serious about farming but may have small, medium, large or very large farms. Generally they have higher operating margins than the other typologies, based on larger assets and higher debt. They invest in their farms and are generally interested in upgrading their skills and knowledge. They receive the bulk of program payments (86 percent) and account for the largest share of agricultural production. They represented 65 percent of farms in Canada in 1999 and accounted for 90 percent of agricultural sales. The typology has proven useful in

Table 2: Characteristics of Farms by Farm Typology, Canada, 1999.

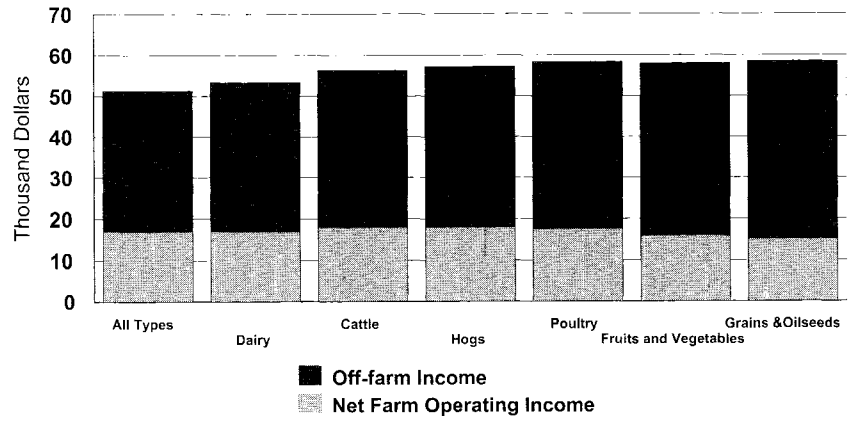
				------ Business Focus ------			
	Retirement	***Lifestyle***	***Low Income***	***Small***	***Medium***	***Large***	***Very Large***
Farm Market Income	8,530	(2,920)	(5,640)	4,600	12,340	28,690	106,880
Farm Wages	2,120	840	900	930	3,040	11,580	46,240
Program Payments	3,490	1,390	2,510	1,850	4,040	9,350	21,090
Total Farm Income	14,140	(690)	(2,240)	7,380	19,410	49,620	174,210
Employment Income	3,170	73,350	5,340	21,640	25,770	12,860	9,990
Pension Income	15,410	3,540	1,180	2,710	1,760	1,010	1,200
Investment Income	3,620	2,950	480	1,330	1,660	1,260	3,970
Other Income	2,630	5,960	900	2,150	2,920	3,280	14,860
Total Off-Farm Income	24,830	85,800	7,900	27,830	32,110	18,410	30,030
Total Family Income	38,960	85,110	5,670	35,210	51,530	68,030	204,240

Figure 19: Relative Importance of Off-farm Income for Farm Operators, by Farm Size, Canada, 1993 to 1999.



Source: Statistics Canada, Whole Farm Database

Figure 20: Relative Importance of Off-farm Income for Farm Operators, by Farm Type, Canada, 1993 to 1999.



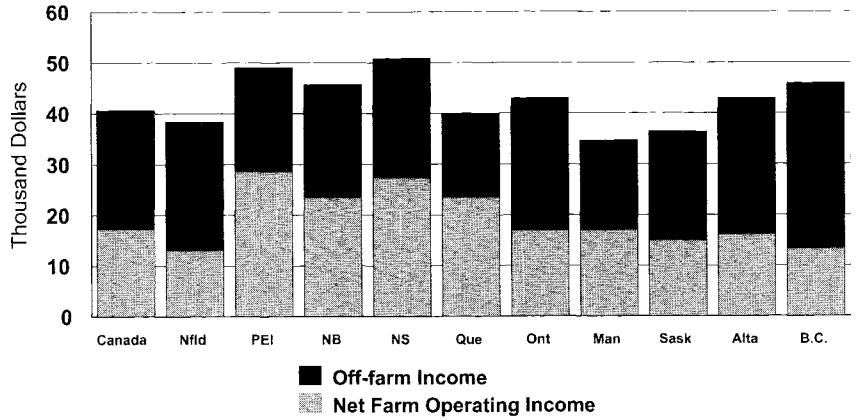
Source: Statistics Canada, Whole Farm Database

analyzing the diverse needs of the agricultural sector, and hence in identifying the policy mix that is necessary to address these diverse needs.

While hobby and lifestyle farms are the most dependent on off-farm income as a source of family income, small to medium farms and large farms also rely on off-farm income as all farm operators report an increasing number of hours spent in off-farm work. These increases can perhaps best be explained by the growth in labour productivity arising from the introduction of new technologies combined with off-farm employment opportunities (and higher wages) in nearby urban centers. In many regions of Canada, the urban centers continue to expand under population pressure. Figure 19 shows the importance of off-farm income for farm operators by farm size in 1999, while Figure 20 and Figure 21 show the same figures for farm type and region. Operators on small farms, for example, are much more reliant on off-farm income than are operators on large farms. By farm type, those operating dairy farms tend to spend more time on the farm than do cattle farm operators, for example. This is a function of the labour requirements of the various farm types: dairy farming is more labour-intensive than cattle farming. Finally, in regions where farms are closer to cities and towns, operators tend to report more off-farm income. British Columbia and Ontario are two such regions, where a large percentage of operators report more off-farm income. In Quebec, on the other hand, a smaller share of operator income comes from off-farm sources (Figure 21).

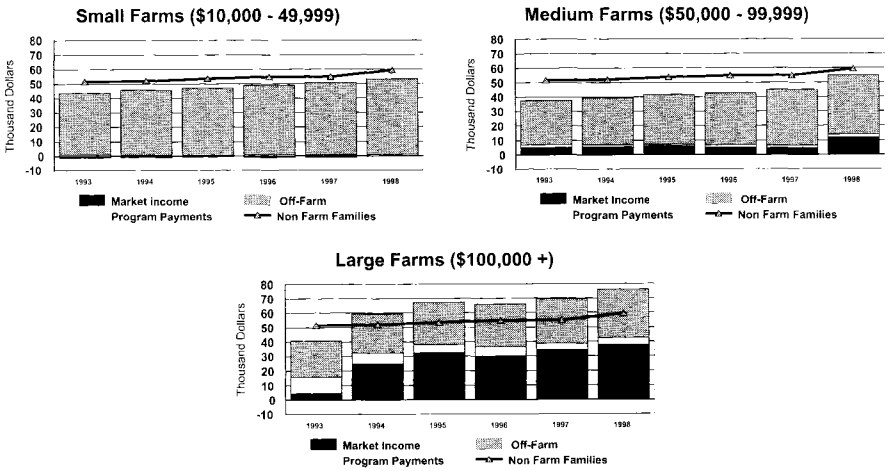
Figure 22 shows the relative importance of (farm) market income, program payments and off-farm income for the average farm family by farm size from 1991 to 1998 and compares total farm family income to that of non-farm families. Increasingly, farm family income has reached parity with non-farm family income. By farm size, however, it is clear that families on small farms report family income comparable to that of non-farm families because of their large sources of off-farm income. Families on large farms, on the other hand, report family income that exceeds that of non-farm families because of their high net farm income. Only families on medium-sized farms report income below non-farm families. The increasing comparability of farm family and non-farm family income has perhaps resulted from the changes in the farm sector that have led to increased concentration and the tendency to larger farms as well as the increasing importance of off-farm income for operators on smaller farms.

Figure 21: Relative Importance of Off-farm Income for Farm Operators, by Region, Canada, 1993 to 1999.



Source: Statistics Canada, Whole Farm Database

Figure 22: Total Farm Family Income and its Components Relative to All Canadians' Family Income, by Farm Size, 1991 to 1998.



Source: Statistics Canada, Whole Farm Database and Small Area Administration Data.

In summary, the primary agriculture sector has undergone significant structural change over the past fifty years, in particular to fewer farms and more concentrated production, and greater reliance on off-farm income. The

sector continues to adjust to the changing market realities in the face of developments in trade policy, such as those arising from the NAFTA and the WTO, technological change, consumers' perceptions and population growth and pressures. Similarly, structural changes have been occurring in the food and beverage processing, distribution and retailing and food service sectors, and these will be discussed briefly below.

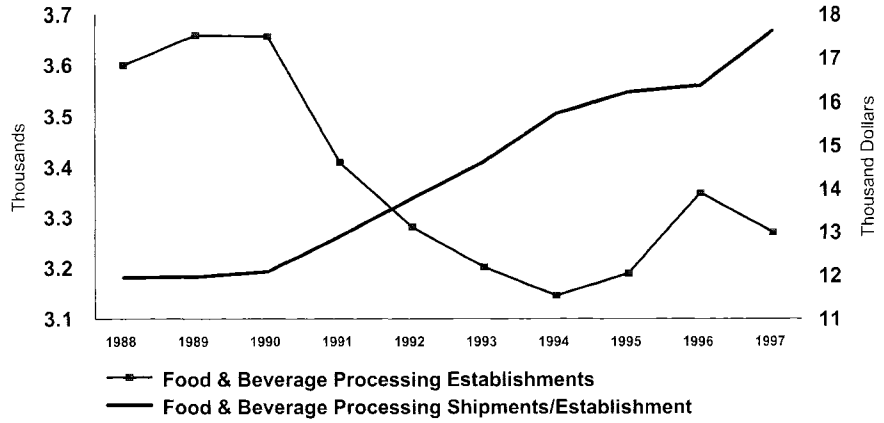
Food Processing, Distribution and Retail Sectors

The food and beverage processing, food distribution and retailing sectors, much like the primary sector, has experienced significant structural change over the 1990s in response to competition and cost pressures arising from globalization. Specifically, consolidation and concentration has occurred in each of these sectors, as indicated by a decrease in the absolute number of firms and an increase in average sales per firm.

The continuing trend towards more open trade has led to increased opportunities and competition for *food and beverage processors*. With open borders, processors have had the opportunity to expand their business through increased exports. However, freer trade also exposed Canadian processors to more foreign competition. As a result, Canadian processors have been driven to increase efficiency in order to compete against foreign imports, and to increase capacity in order to supply larger foreign markets. The quickest way to attain both has been through consolidation where processors could instantly increase capacity, and gain synergies that allowed for increased efficiency. A move toward more vertical integration with producers in pork and cattle markets, for example, and increased contracting, have also helped the sector gain efficiencies. The result has been increased consolidation, as shown in Figure 23 and rising operating margins as shown in Figure 24.

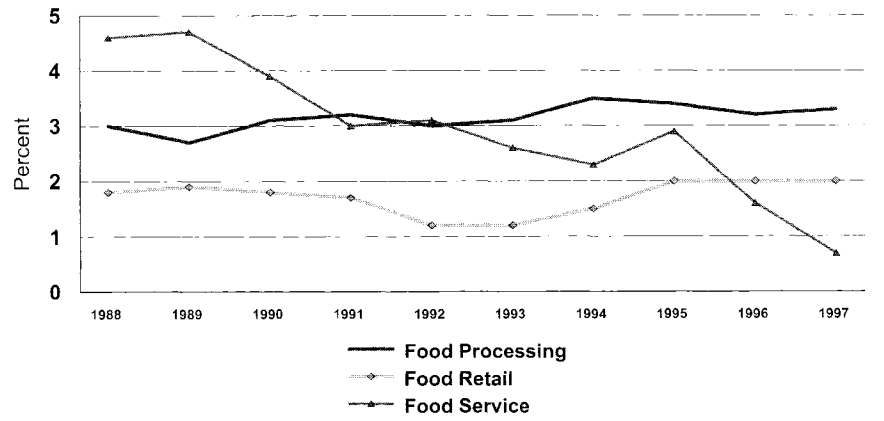
The NAFTA played an important role in shaping the current structure of the food processing sector. In addition to increasing competition and expanding markets for Canadian processors, NAFTA led to the creation of continental markets for products like beef. As a result, existing processors became more specialized. Over time, and particularly since NAFTA, Canadian exports of value-added or consumer oriented food and beverage processing exports have expanded rapidly (Figure 4), benefitting the Canadian food and beverage

Figure 23: Number and Average Shipments for Food and Beverage Processing Establishments, Canada, 1988 to 1998.



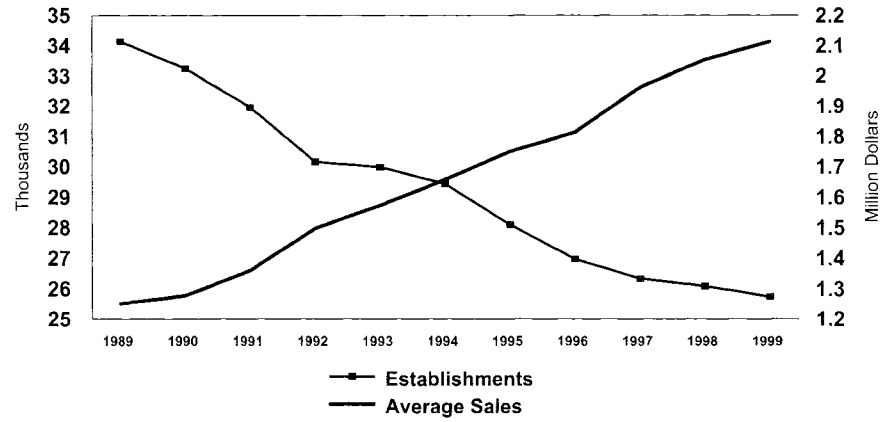
Source: Statistics Canada, Census of Manufacturers

Figure 24: Operating Margins for Food and Beverage Processing, Food Retailing and Food Service, Canada, 1988 to 1998.



Source: Statistics Canada, Census of Manufacturing

Figure 25: Number and Average Sales for Food Retail Establishments, Canada, 1989 to 1999.



Source: Statistics Canada

processing industry and contributing positively to Canada's merchandise trade balance.

Food retailing is a mature sector with low profitability and high levels of concentration and competition. Real spending in food stores grew just 2 percent a year between 1989 and 1998 (Little and Bennett ,2000). In the 1980s and early 1990s, consolidation occurred as large players purchased small players in an effort to reduce costs and expand sales. In the latter half of the 1990s, large food retailers started to consolidate among themselves (e.g. Loblaw and Provigo), leading to a decline in the number of enterprises while average sales increased (Figure 25). Before the latest round of consolidation, the Canadian market was regionally-based, with large regional players. The latest round of consolidation was meant to both increase efficiency and expand the chains nationally to meet increased competition from two national chains, Walmart and Costco, which have been expanding their food departments to compete in food retailing[1]. This new round of consolidation has led to fears of retailers exercising market power. Profitability has increased in the retailing segment mainly

[1] According to an article in the *Canadian Grocer,* Wal-Mart and Costco quietly and quickly obtained 7 percent of the Canadian grocery market, and figures that they will control 10 percent by 2005.

through increased efficiencies and movement into higher value-added and non-food products (Figure 24). With only moderate growth expected in the Canadian population, retailers will further reorient themselves towards increased value-added food items and non-food services to increase sales and profit margins.

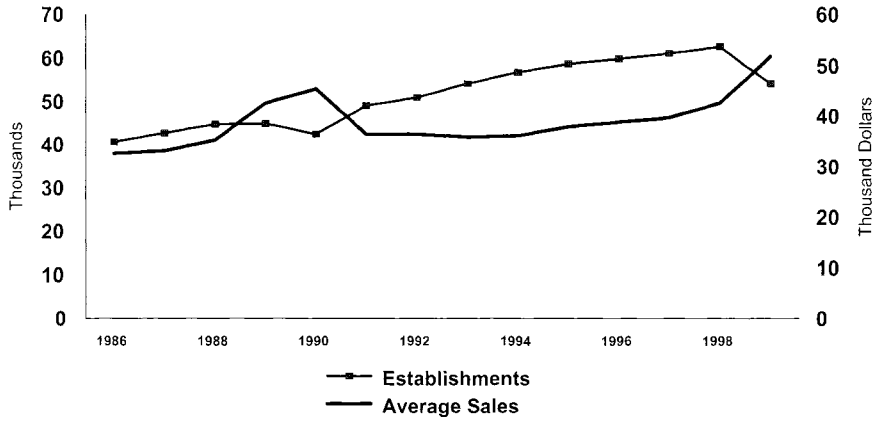
The food service sector is different from the other segments of the agri-food chain in that it is more affected by changes in general economic conditions than the other segments. Whereas the general quantity of food purchased by households is fairly constant over time, the amount consumers are willing to allocate to eating out varies greatly. This is in part due to the fact that as disposable incomes rise, people generally place a higher value on their leisure time. The trend toward dual income families has also increased the demand for time-saving restaurant meals. With less time and more income, consumers will substitute purchased groceries with eating out. However, because of the greater income elasticity of demand for food away from home, this process works in reverse during an economic downturn.

The food service industry was hit with a one-two punch in the late 1980s and early 1990s. First, the Canadian federal government introduced a value-added tax (Goods and Services Tax) in 1989 which was applied to food in restaurants, but not food purchased from grocery stores. This effectively made eating away from home relatively more expensive[2]. Second, in 1991, a severe recession lowered disposable incomes, and led to a decrease in spending on food away from home.

During the 1980s and 1990s, the food service segment, like the food and beverage processing sector, went through a period of consolidation, resulting in the top 10 Canadian food service companies controlling all the major fast food chains, and some of the fine dining chains (Globe & Mail, 2001). Over this period, the number of establishments increased from 16.5 per 10,000 people in 1989 to 20.7 per 10,000 people in 1998 and the average sales of food-service

[2] According to the study by Little and Bennet (2000), the nominal price of food from stores increased 2.3 percent while the nominal price of a restaurant meal increased 10.8 percent after the introduction of the Goods and Services Tax (GST) in 1989.

Figure 26: Number and Average Sales for Food Service Establishments, Canada, 1986 to 1997.



Source: Statistics Canada

* Due to NAICS Conversion the 1998 and 1999 figures are not comparable to the figures in preceeding years. Statistics Canada does not plan to back cast this series to make it NAICS comparable.

establishments increased only moderately (Figure 26). This was due to increased competition both from within the food service segment, and from the processing and retailing segments. Over the 1990s, in an effort to increase their profit margins, food processors started to introduce ready-to-eat, healthy meals to compete against restaurants. Concurrently, the major retail chains (Walmart, Costco) introduced their own delis, cafés, and eat-in sections to try to retain more of the consumer food dollar. Increased competition and rising labour costs have driven the profitability of food service firms (Figure 25) down from 4.5 percent in 1988 to under 1 percent in 1997. The low returns and high competition in the food services sector may spark another round of consolidation. Recent news that CARA foods increased its control of Second Cup coffee (Globe & Mail, 2001) may be a sign that a new round of consolidation has started.

SUMMARY

The agri-food sector has undergone significant structural change since the early 1980s. The number of farms continues to fall as farmers become more productive in the face of increasingly sophisticated technology. The food and beverage processing, retail and food service sectors also continue to become more efficient and restructure in the face of competition in North American markets. Factors related to the introduction of new technology and marketing arrangements have played a role in conjunction with changing consumer tastes, preferences and concerns. However, perhaps the most important factor that has influenced structure and will continue to shape its path is the change on the trade policy front and the increasingly globalized nature of trade. The late 1980s and early 1990s saw the introduction of CUSTA, NAFTA and the WTO Agreement. Canada's agri-food sector has had to become more efficient and open to trade. While Canada has traditionally specialized in bulk exports, our trade has become increasingly consumer-oriented and this has benefitted the sector by raising value-added. Recent trade developments, including NAFTA have therefore helped Canada position itself to become a strong player on the world trading front and further structural change is expected in the years ahead.

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Section 2

Farm Structure Under Free Trade

The objective of this section is to analyze how farming would change under full free trade.