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Agriculture and  
Agri-Food Canada

Agriculture et  
Agroalimentaire Canada



# of the **An Overview** **Canadian Agriculture** and **Agri-Food System**

## 2008

Canada 

# **An Overview of the Canadian Agriculture and Agri-Food System**

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This publication comprises data and analysis provided by all four divisions of the Research and Analysis Directorate as well as contributions from other Divisions and Branches of Agriculture and Agri-Food Canada particularly the Food Value Chain Bureau.

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Strategic Policy Branch  
Agriculture and Agri-Food Canada

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# FOREWORD



This 2008 report provides an economic overview of the Canadian agriculture and agri-food system.

It is meant to be a multi-purpose reference document to provide:

- an introduction to the agriculture and agri-food system;
- a snapshot of structural changes that are occurring throughout the system in response to various factors; and
- background data and information to inform public discussions on challenges and opportunities facing the Canadian agriculture and agri-food system.

Charts and tables with brief accompanying texts are used to summarize information and to provide base performance indicators.

The 2008 report begins with a special feature describing recent developments in global commodity markets when prices rose dramatically over the past year.

It continues by reviewing each segment of the system, going upstream from consumers to food distribution, food, beverage and tobacco (FBT) processing, primary agriculture, and input suppliers. It concludes with a review of government expenditures in support of agriculture including measures of international support. It introduces a new section this year that considers the natural resources available in Canada and the environmental impacts of agriculture on the environment.

It describes the Canadian agriculture and agri-food system as a highly complex, integrated, internationally competitive and growing part of the Canadian economy. It is a resilient system, responding to the challenges and opportunities it faces by restructuring and adapting to changing consumer demands, advancing technology, increased demand for non-food and non-feed products, North American integration and globalization.



# HIGHLIGHTS



- The agriculture and agri-food system encompasses several industries including the farm input and service supplier industries, primary agriculture, food, beverage and tobacco (FBT) processing, wholesale and retail food industries and foodservice. It continues to play an important role in the federal and provincial economies, making a significant contribution to Gross Domestic Product (GDP) and employment. It directly provided one in eight jobs and accounted for 8% of total GDP in 2006.
- Export opportunities are critical for the growth of most Canadian agriculture and agri-food industries. In 2007, Canada was the fourth-largest exporter and sixth-largest importer of agriculture and agri-food products in the world, with exports and imports valued at \$32 billion and \$26 billion, respectively.
- The agriculture and agri-food system is becoming more internationally focussed with Canada's share of world agriculture and agri-food trade increasing over the past 15 years in response to trade liberalization and growing world economies. The composition of the agriculture and agri-food system's trade has also changed with increasing exports of consumer-oriented goods that meet changing international demands.
- Changing consumer demands are influencing changes throughout the whole agriculture and agri-food system. Consumers are demanding more variety, more convenience, more environmentally-friendly and healthier food choices, accompanied by proper assurances of quality and safety.
- Canadians enjoy some of the lowest food costs in the world, with food from stores accounting for only 10% of personal household expenditures in recent years.
- In response to challenges and changing market conditions, the agriculture and agri-food sector has gone through considerable transformation with a continued trend towards fewer, larger farms and firms and increased concentration. There is also an increasing number of farms and firms diversifying production, growing organic products and adopting environmentally-friendly production methods.
- The agriculture and agri-food sector is also continuously developing innovative products such as bio-products and functional foods and nutraceutical (FFN) products that provide excellent market opportunities to diversify and meet challenges in a competitive global market.
- The prosperity of the sector depends on its ability to be productive and competitive. Although Canada has become more competitive in the net export of various agricultural and agri-food products, it has lost competitiveness in several sectors due to rising costs.
- Innovation is a key factor in determining competitiveness, with public and private spending on research and development (R&D) as a major input to innovation. Public R&D spending in the agriculture and agri-food sector has been increasing over time. However, private R&D spending as a share of GDP in the food manufacturing industry is significantly lower than that of total manufacturing.
- While primary agriculture accounts for a small share of the total economy, it is at the heart of the agriculture and agri-food system. Any changes in commodity markets can therefore have impacts on the performance of primary agriculture and the whole supply chain.

- Canadian farms differ by size, scale, farm type and typology, while farm operators differ by management skills and business strategies. Therefore differences in performance between farms can be explained by this diversity.
- Farm income varies by farm size, type, region and typology. On average, high performance farms tend to have better cost control, which along with support from government policies and programs help them manage through income variability. Some farm families rely more on off-farm income to help them manage.
- The food, beverage and tobacco (FBT) processing sector is a group of industries that transforms primary production and is the second most important manufacturing sector in Canada.
- FBT processing experienced growth in 2007 leading to higher GDP, but higher input costs are squeezing margins and forcing the sector to adjust business strategies.
- Input suppliers and service providers also perform important functions in the agriculture and agri-food system. In 2007, producers spent over \$38 billion in operating expenses, with commercial feed constituting the largest part of expenses. In addition to already large input expenses, recent increases in the costs of fuel, fertilizer and pesticides are putting added pressure on farmers. Recent increases in feed prices have added to the financial pressures for livestock farms in particular.
- Total government (federal and provincial) support to the agriculture and agri-food sector rose to a record high level in 2007-2008 at an estimated value of \$8.1 billion or just under 40% of total sector GDP.
- Program payments continue to account for the largest portion of both federal and provincial government expenditures in support of the sector in 2006-2007, followed by spending on research and inspection.
- Government support to the sector varies across provinces. On the basis of government support as a percentage of agriculture and agri-food GDP, farmers in Quebec, Nova Scotia and Newfoundland and Labrador received the most support.
- Agricultural policies in Canada and other countries have evolved over time. Some countries have made major reforms to their agricultural policies, leading to reductions in levels of support and modifications to the types of support provided.
- Canada's Producer Support Estimate (PSE) for all commodities was estimated at 18% in 2007 compared to 10% for the U.S. and 26% for the EU(27). In 2007, the percent PSE declined for the main OECD countries mainly because of increased farm gross receipts and reduced market price support due to higher world prices in all countries but the U.S.

# EXECUTIVE SUMMARY

## The agriculture and agri-food system continues to be a complex and highly integrated group of industries that contributes significantly to the Canadian economy.

The agriculture and agri-food system continues to play a significant role in the Canadian economy, particularly when the whole supply chain is considered. The agriculture and agri-food system contributed \$87.9 billion (chained 1997 dollars) to the country's Gross Domestic Product (GDP) or 8% of the Canadian economy and employed 2.1 million Canadians in 2006. This complex, integrated production and distribution system includes input and service suppliers, primary agriculture producers, food, beverage and tobacco (FBT) processors, food retailers and wholesalers and foodservice providers.

The importance of the agriculture and agri-food sector varies across provinces, with food processing being more important in Eastern Canada, and primary agriculture being more important on the Prairies.

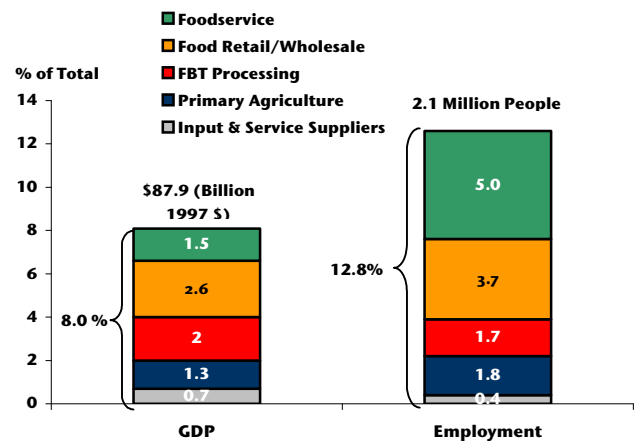
## The Canadian agriculture and agri-food sector depends on trade

The agriculture and agri-food system has been growing at an average rate of 2.4% per year over the past decade with most of the growth in GDP occurring in FBT processing, food retail/wholesale and foodservice.

Growth in the system has been driven partly by export growth, and in particular, by exports of consumer-oriented products. In 2007, total sector export sales reached \$32 billion, with just under 50% representing consumer-oriented products.

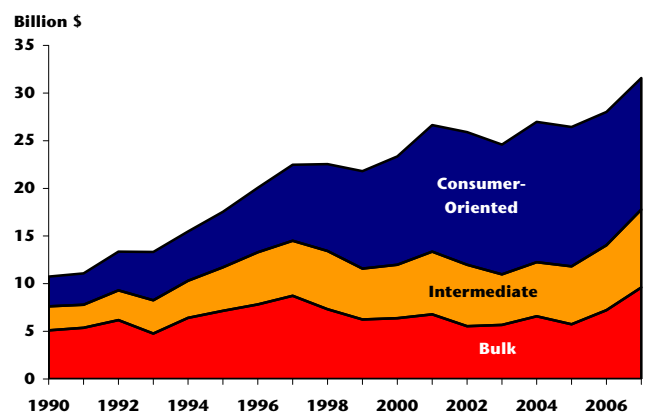
Canada continued to be the world's fourth largest agriculture and agri-food exporter in 2007 after Brazil, the U.S. and the EU with 5.6% of total world exports if EU countries are counted as a trade bloc, and 3.1% if they are treated separately.

The Agriculture and Agri-Food System's Contribution to GDP and Employment, 2006



Source: Statistics Canada and AAFC calculations.

Canadian Agriculture and Agri-Food Exports (BICO)\*, 1990-2007



Source: Statistics Canada and AAFC calculations.

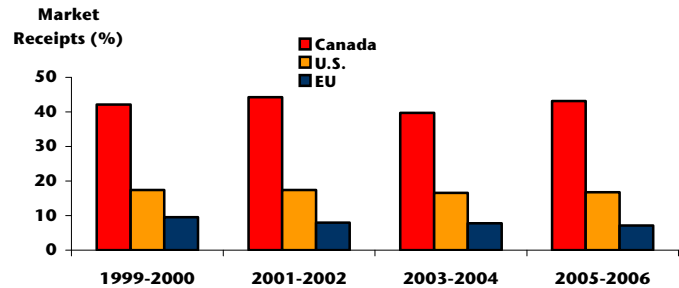
\*BICO: Bulk, Intermediate, and Consumer-Oriented.



**Overall, Canada's agricultural producers are much more export oriented than those in the U.S and the EU.**

In 2006, for example, about 45% of Canada's agricultural production was exported compared to 18% in the U.S. and 7% in the EU. Grains and oilseeds and red meats were particularly export oriented.

**Share of Farm Market Receipts from Export Sales for Canada, the U.S. and the EU, 1999-2006**



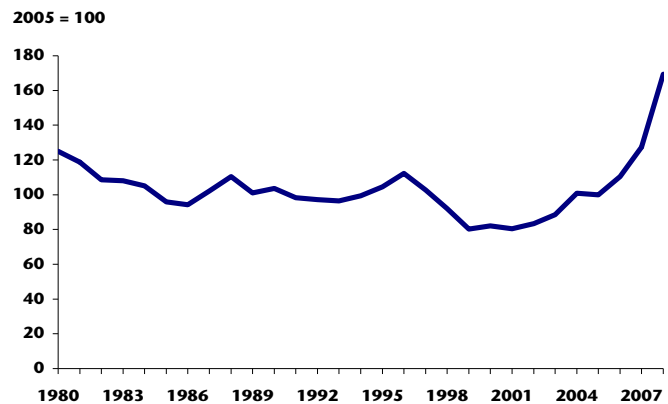
Source: Statistics Canada, OECD and AAFC calculations.

Note: Export dependency is calculated as a value of production weighted average of the export dependencies of the following commodities - wheat, coarse grains, oilseeds, beef, pork, dairy and poultry. These commodities cover about 50% of the EU's total farm production, 60% of the U.S.'s total of the farm production and 75% of Canada's total farm production.

**A rise in global commodity prices in 2007 and early 2008 has had an impact on the performance of the agriculture and agri-food system.**

Global commodity prices increased in 2007 and early 2008 as a result of changes in supply and demand conditions around the world. The World Food Price Index roughly doubled between 2002 and 2008. During the first half of 2008 in particular, world food prices rose 32% over 2007 prices.

**World Food Price Index, 1980-2008\***



Source: International Monetary Fund (IMF).

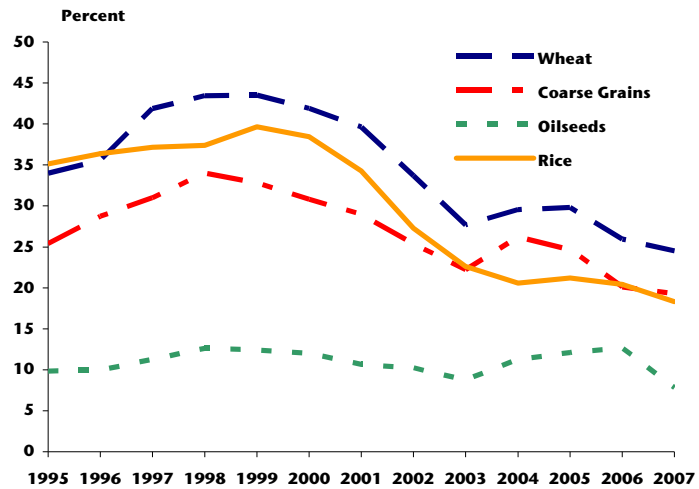
\*Note: 2008 data reflects prices as of June 2008.

**Changing supply and demand conditions around the world has led to higher commodity prices.**

A rising middle income class in emerging economies contributed to increased demand for higher-value agricultural commodities such as meat and dairy products.

This, combined with droughts in Australia and poor weather in Europe, tightened supplies and led to the lowest stock-to-use ratios for grains and oilseeds in several years. Stock-to-use ratios for wheat were 25% in 2007, down from 44% in 1999. Stock-to-use ratios for coarse grains fell to 20% in 2007 from 33% in 1999. At the same time, many countries reduced their public stock holdings of cereals over this period.

**Stock-to-Use Ratios, 1995-2007**



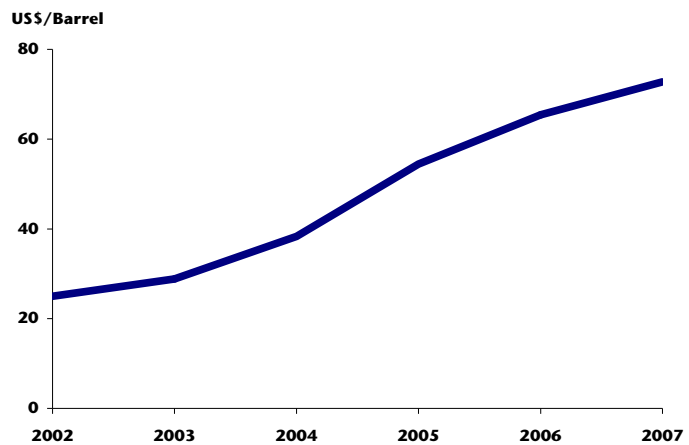
Source: OECD.

**At the same time, rising energy consumption has contributed to higher crude oil prices which have raised input costs.**

Crude oil prices climbed from \$US25 per barrel in 2002 to \$US72 per barrel in 2007 and reached over \$US140 per barrel in mid 2008 before falling back.

Higher energy prices enter directly into farmers' and food manufacturers' costs of production, increase transportation costs and indirectly affect prices of other inputs.

**World Crude Oil Prices, 2002-2007**

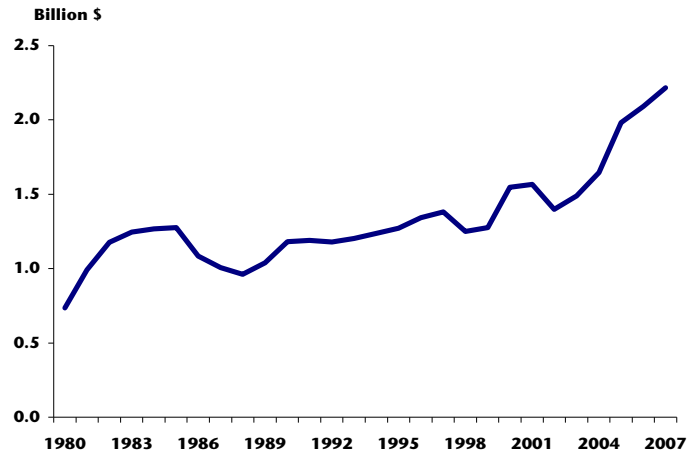


Sources: IMF and AAFC calculations.

**Higher energy and agricultural commodity prices have affected sector performance.**

Higher crude oil prices have also contributed to higher input costs, such as farm expenses on machinery fuel and fertilizer, as well as raising the costs of transporting food products around the world.

**Farm Expenses on Machinery Fuel, 1980-2007**

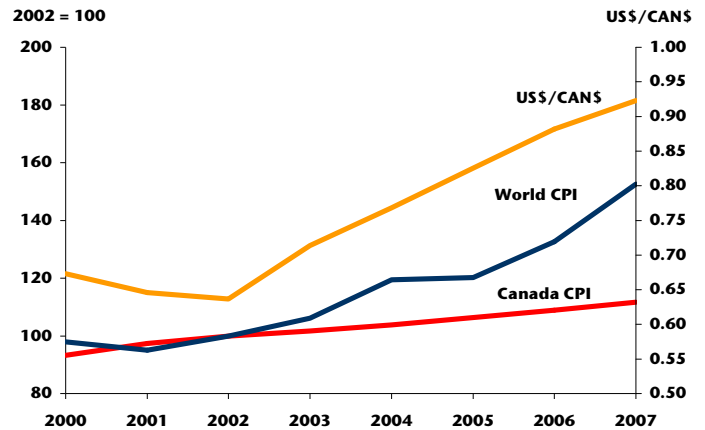


Source: Statistics Canada.

**In Canada, rising commodity prices have had a limited impact on food price inflation, as the appreciation of the Canadian dollar since 2003 partially moderated food price increases in Canada.**

The Canadian dollar appreciation also had other impacts on the Canadian agriculture and agri-food sector. This included dampening export demand, lowering farm and food market export revenues and increasing the relative labour cost in Canada and the U.S. It also lowered the cost of imported inputs, such as machinery and equipment, thereby encouraging investment in the sector.

**World and Canadian Food Price Indices and U.S./Canada Exchange Rate, 2000-2007**

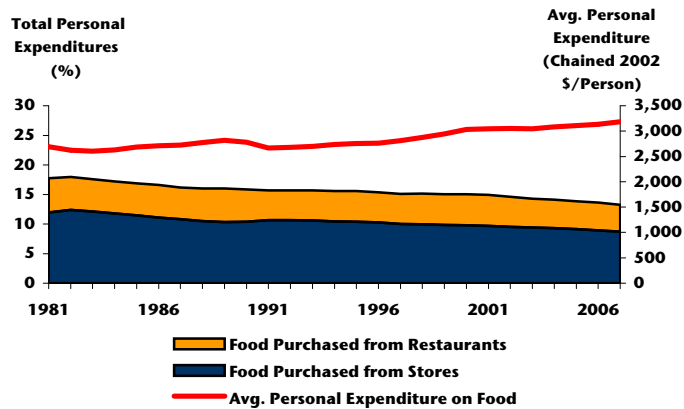


Sources: Bank of Canada; Statistics Canada; IMF.

**Canadian consumers continued to spend a smaller share of their budgets on food in 2007.**

In 2007, Canadians spent \$150 billion on food from stores and from restaurants. This represented only 13% of their total personal spending, down from 17% in 1981. This occurred as real per capita personal disposable income increased in 2007. While spending on food from stores was down to under 10% of total spending, the share allocated to restaurant meals continued to become more important.

**Average Personal Expenditures on Food as a Share of Total Personal Expenditures, 1981-2007**

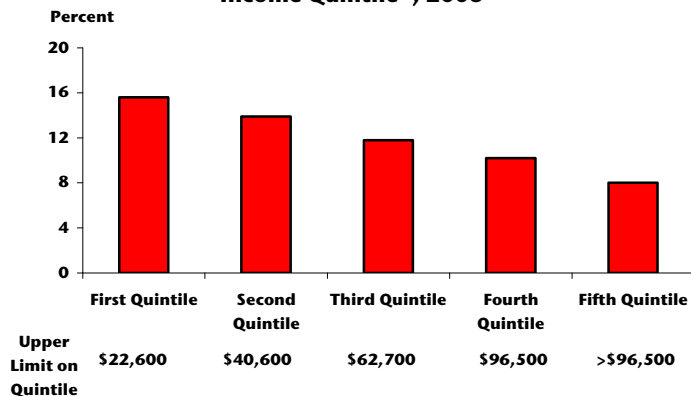


Source: Statistics Canada and AAFC calculations.

**The lowest income households in Canada, however, allocated larger shares of spending on food (16% in 2006) compared to the average.**

While Canadian food prices increased only moderately in the wake of global commodity price inflation, low income Canadians are affected since they spend more on food.

**Share of Household Food Expenditures by Income Quintile\*, 2006**



Source: Statistics Canada and AAFC calculations.

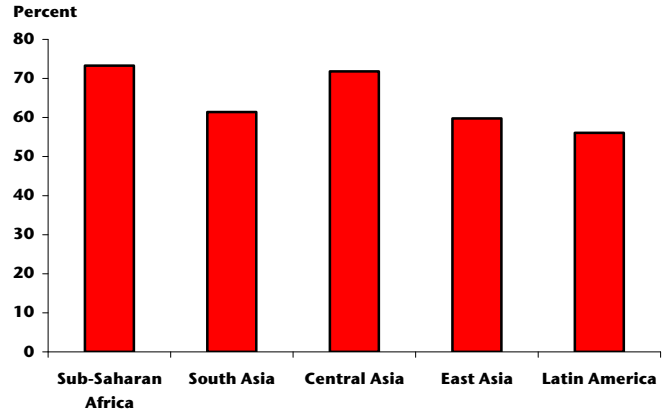
\*Quintile: Households are ranked in ascending order by total household income and are then divided into five equal groups. The 1st quintile is the lowest 20% of households and the 5th quintile is the highest 20% of households.

**Compared to many other countries, Canadians spend a relatively small share on food from stores (10%), as do citizens in the U.S. and the UK.**

This compares with emerging countries, where large portions of the population live on less than US\$1 per day, and allocate well over 60% of total household expenditures on food.

Global commodity price increases in 2008 have hit citizens in these countries particularly hard, leading to calls for greater food aid to those regions.

**Household Expenditure Share of Food in Developing Countries Living on Less than US\$1/Day, 2006**

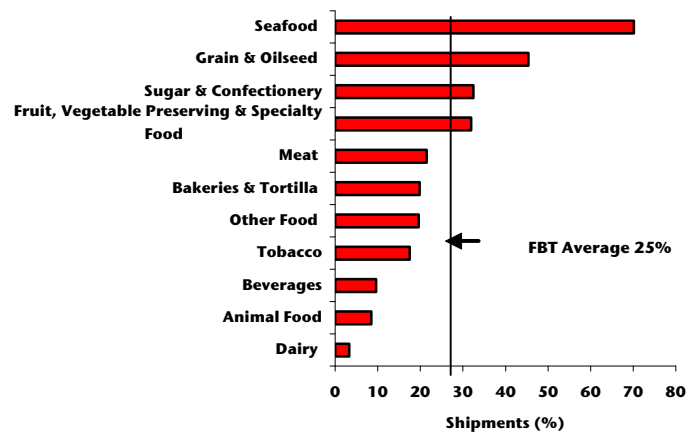


Source: International Food Policy Research Institute (IFPRI).

**The food, beverage and tobacco (FBT) processing sector has also been affected by international market developments in 2007 and 2008.**

FBT processing is the second-largest manufacturing sector in Canada after transportation equipment. The FBT industry is highly export oriented with some sub-sectors more dependent on trade than others. Therefore, it has been affected by the appreciated exchange rate. Nevertheless, FBT GDP was up 2.2% in 2007.

**FBT Processing Export Intensities, by Sub-industry, 2007**

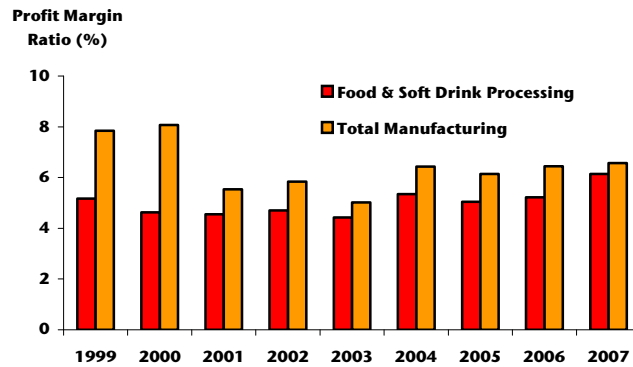


Source: Statistics Canada and AAFC calculations.

**Profit margins were higher in 2007 but the gap between FBT and total manufacturing narrowed.**

2008 is seeing higher raw material, labour, transportation and energy costs. This, combined with an appreciated exchange rate, is creating competitive pressures that are leading the industry to further rationalize and restructure.

**Profit Margin Ratio in Food and Total Manufacturing, 1999-2007**

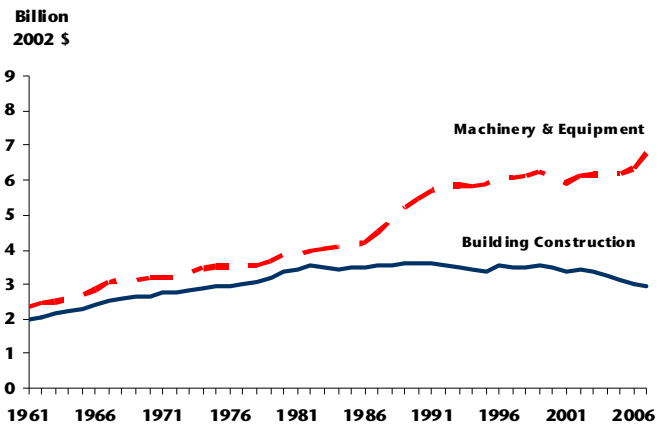


Source: Statistics Canada.

Note: See Glossary for definition of the profit margin ratio.

Lower costs for imported machinery and equipment, because of an appreciated exchange rate, have meant that food manufacturers have been able to invest in new capital stock particularly machinery and equipment. This may lead to productivity improvements and enhanced competitiveness in the future.

**Capital Stock, Canadian Food Processing, 1961-2007**



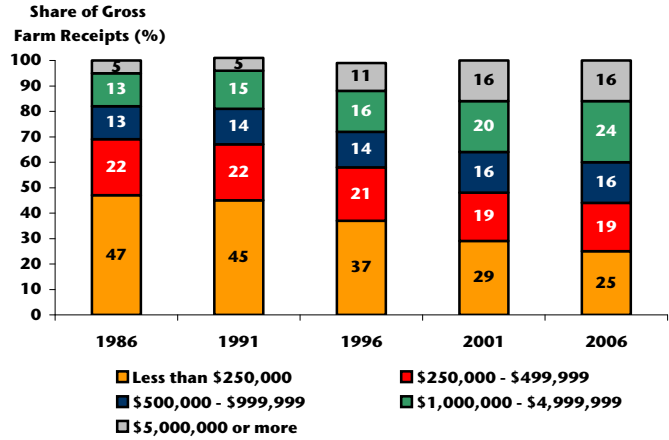
Source: Statistics Canada

Note: End-year net stock (Geometric).

**The primary agriculture sector continues to adjust to international market forces.**

In the primary agriculture sector, there is an increasing number of large farms that dominate production. Million dollar farms account for only 2.5% of farms, but account for 40% of revenues, and their importance has increased over time. Farms have consolidated in order to be able to benefit from economies of scale and improvements in productivity and new technologies in order to compete.

**Distribution of Gross Farm Receipts by Revenue Class (2005 Constant \$), 1986-2006**

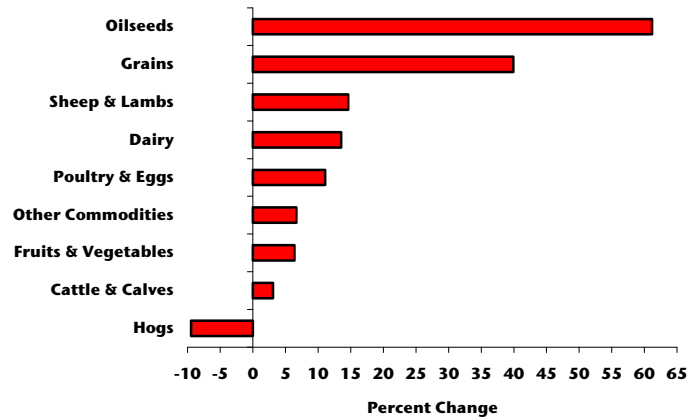


Source: Statistics Canada, 2006 Census of Agriculture.

Farming remains a highly-diverse sector. Some highly-profitable farms are small, business focussed farms, while less profitable farms are lifestyle farms that rely largely on off-farm income.

In 2007 and 2008, as commodity prices have risen, farm market receipts and net farm income for grain and oilseed farms have also increased. Livestock farms, on the other hand, which have experienced higher feed costs and lower prices due to high liquidation of herds, are experiencing lower receipts and net farm income.

**2007 Farm Market Receipts by Commodity, Relative to Five-Year Average**



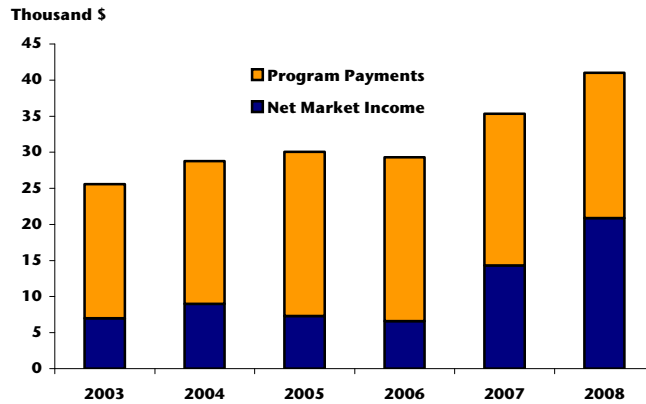
Source: Statistics Canada.

**Program payments are expected to be down in 2008 from previous years as market income has grown.**

Net market income per farm is expected to increase from \$14,300 to \$20,877 for farms between 2007 and 2008.

Program payments per farm are expected to fall from \$21,013 to \$20,144 for farms between 2007 and 2008.

**Average Net Market Income and Program Payments, 2003-2008**

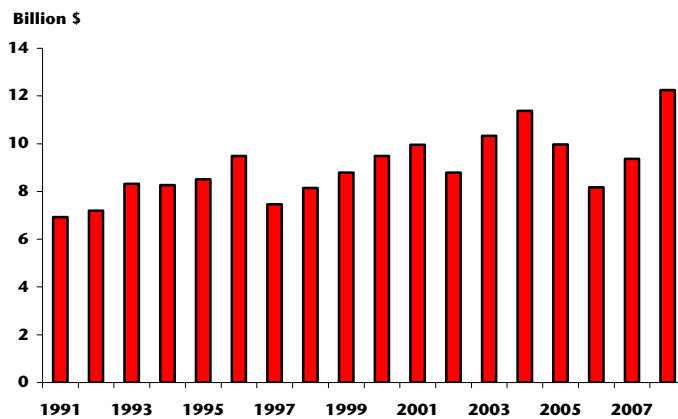


Source: Statistics Canada and AAFC calculations.  
 Note: 2008 figures are forecasts.

**Net value-added in agriculture, which measures the economic activity of the sector as a whole, is expected to be higher in 2007 and 2008 than in previous years.**

Agriculture’s net-value added will rise to \$12.2 billion in 2008, up from \$9.4 billion in 2007. This is due to the rapid growth in the value of agricultural production, as improved prices in the crop sector will more than offset high costs of production and lower receipts for red meat producers.

**Value-Added in Agriculture, 1991-2008**



Source: AAFC calculations.  
 Note: 2008 figures are forecasts.

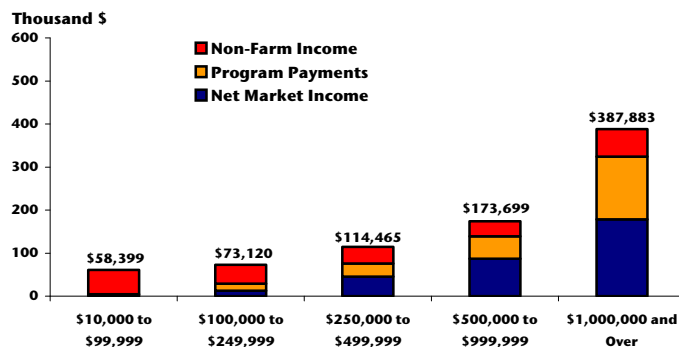


**Families on smaller farms are more dependent on non-farm income.**

For smaller farms, non-farm income along with program payments are enough to offset negative and low net market income.

Even large farms rely to some extent on non-farm income.

**Average Income of Farm Families by Source of Income, 2008**



Source: Statistics Canada and AAFC calculations.

Note: 2008 figures are forecasts.

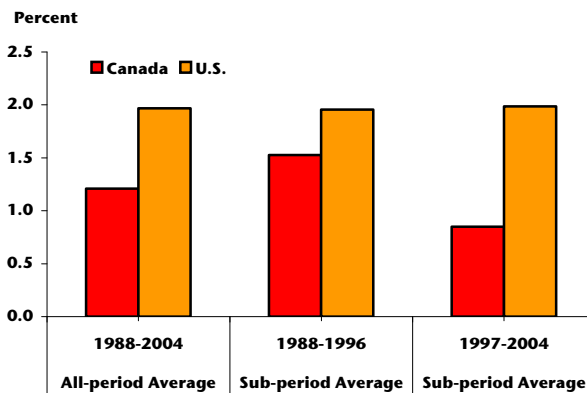
Net Market Income does not include CCA.

**Productivity growth in agriculture has slowed in recent years, while that in FBT processing has increased relative to total manufacturing.**

Total factor productivity growth in agriculture, which measures the growth in output per unit of inputs, decreased from average annual rates of 1.5% in 1988 to 1996 to 0.9% in 1997 to 2004. It has consistently been lower than in the U.S.

Productivity growth in FBT processing has been low relative to total manufacturing, but increased in recent years faster than in the U.S.

**Comparison of Total Factor Productivity Growth in Primary Agriculture: Canada vs. the U.S., 1988-2004**



Source: Statistics Canada and U.S. Dept. of Agriculture (Economic Research Service).

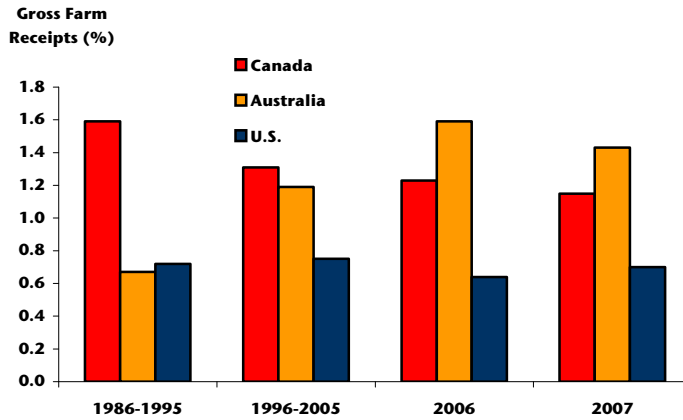
Note: This data is geometric mean growth rates, calculated with a gross output measure of total factor productivity growth.

**Productivity improvements occur as a result of R&D investments and innovation.**

In primary agriculture, public spending on R&D has fallen both in absolute terms and as a share of gross farm receipts, and relative to Australia and the U.S.

Private R&D spending on FBT processing, which is lower than in total manufacturing, has stabilized after having increased in 2004.

**Public R&D Support to the Agriculture and Agri-Food Sector, 1986-2007**



Source: OECD, Agricultural Policies in OECD Countries: At a Glance, 2008.

**Canada is endowed with a relative abundance of arable land and water.**

Canada's rank as second in the world for the availability of arable land per person explains our status as a large producer and exporter of agricultural products. Canada's share of land suitable for agricultural production is only a small percentage (5%) of the total.

**Arable Land in Canada Relative to Other Countries, 2005**

|               | Arable land<br>('000 ha) | % of world<br>arable land | Population<br>('000 people) | ha/person   | Rank     |
|---------------|--------------------------|---------------------------|-----------------------------|-------------|----------|
| Australia     | 49,742                   | 3.2                       | 20,000                      | 2.49        | 1        |
| <b>Canada</b> | <b>52,110</b>            | <b>3.3</b>                | <b>32,000</b>               | <b>1.63</b> | <b>2</b> |
| Russia        | 123,581                  | 7.9                       | 143,000                     | 0.86        | 3        |
| Ukraine       | 33,353                   | 2.1                       | 47,000                      | 0.71        | 4        |
| U.S.          | 177,178                  | 11.3                      | 296,000                     | 0.60        | 5        |
| Brazil        | 66,600                   | 4.3                       | 184,000                     | 0.36        | 6        |
| Nigeria       | 35,000                   | 2.2                       | 134,000                     | 0.26        | 7        |
| Indonesia     | 36,600                   | 2.3                       | 220,000                     | 0.17        | 8        |
| India         | 169,650                  | 10.9                      | 1,102,000                   | 0.15        | 9        |
| China         | 156,327                  | 10.0                      | 1,304,000                   | 0.12        | 10       |

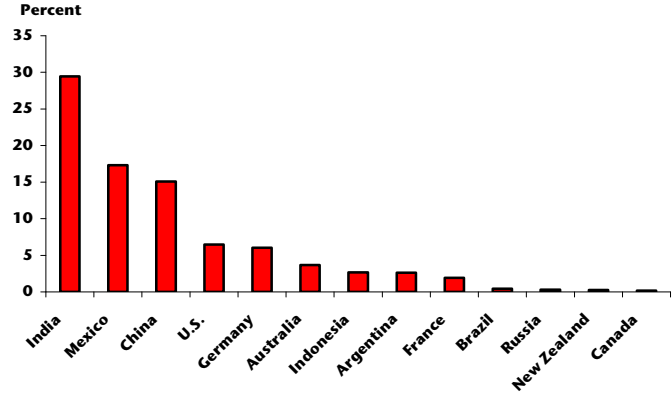
Sources: United Nations, Demographic Yearbook 2005.

Food and Agriculture Organization of the United Nations (FAO).  
<http://faostat.fao.org>

**In Canada, agriculture uses a relatively small share of its abundant renewable water resources for irrigation and livestock.**

In Canada, only 0.18% of the country’s total renewable water resources were used for agriculture. This compares with India where 30% of total renewable water resources are for agricultural use.

**Agricultural Water Withdrawal as a Percentage of Total Renewable Resources in Selected Countries, 1998-2002 Average**

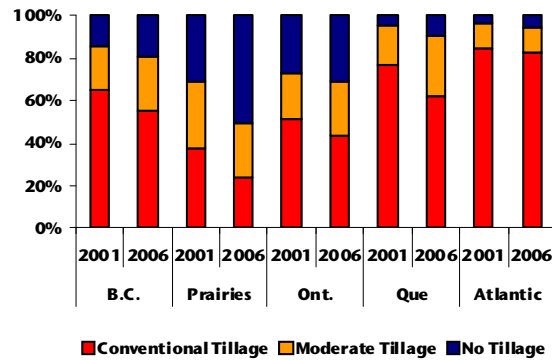


Source: Calculated from AQUASTAT database of the Food and Agriculture Organization (FAO).

**Canadian farmers are adopting environmentally-friendly best management practices which are sustainable.**

Canadian farmers are increasingly adopting management practices to farm with environmental concerns in mind by conserving the soil, protecting water quality and reducing greenhouse gas emissions through best management practices. Increased no-till practices are an example of a practice which leads to reduced fuel and fertilizer costs while helping conserve soils.

**Tillage Practices by Region, 2001 and 2006**

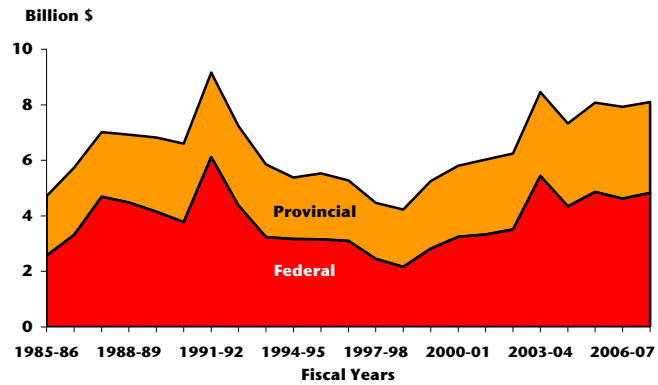


Source: Census of Agriculture, 2006.

**Government expenditures in support of the agriculture and agri-food sector have grown over time, but declined as a share of GDP.**

Federal and provincial government expenditures in support of the agriculture and agri-food sector increased to \$8.1 billion for the 2007-08 fiscal year, up slightly from the previous year. As a share of GDP, however, they have fallen to under 40%, the lowest share in two decades.

**Government Expenditures in Support of the Agriculture and Agri-Food Sector, 1985-86 to 2007-08 Fiscal Years**

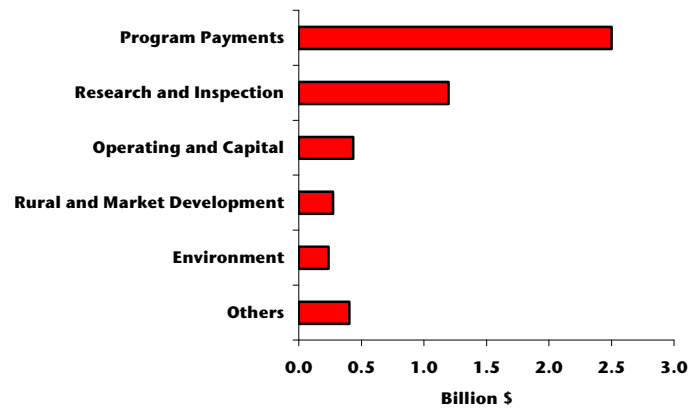


Source: AAFC.

Note: 2007-08 figures are forecasts.

Program payments make up the largest portion of federal government support, accounting for 50% of the total in 2007-08. Research and inspection spending was the second largest category at 24% of the total.

**Federal Government Expenditures in Support of the Agriculture and Agri-Food Sector by Major Category, 2007-08 Fiscal Year**

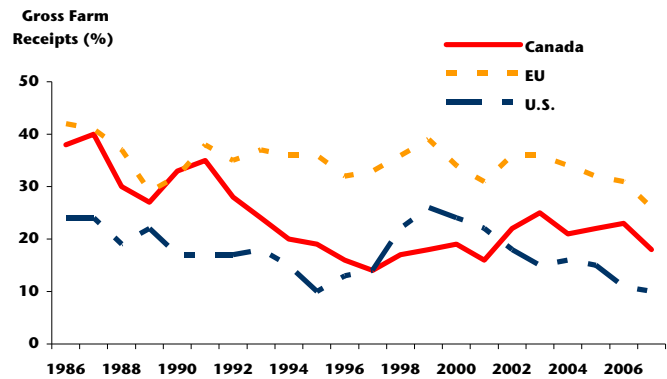


Source: AAFC.

Note: 2007-08 figures are forecasts.

Based on the OECD estimates of Producer Subsidy Equivalents (PSE), support to Canadian producers as a share of gross farm receipts fell from 20% in 2006 to 18% in 2007, primarily due to an increase in farm receipts and a decrease in market price support due to higher world commodity prices. This compares with the EU and the U.S., where the PSE was 26% and 10% respectively, in 2007.

**Percent of PSE, Selected Countries, 1986-2007**



Source: OECD, Trade and Agriculture Directorate, Producer and Consumer Support Estimates, OECD Database 1986-2007.



SECTION A

**Special Feature**





# SECTION A1

## **Global Food Price Inflation**

Global prices for commodities such as crude oil, wheat and rice rose in 2008 as a result of changes in supply and demand conditions around the world. A rising middle income class in emerging economies has contributed to increased demand for commodities, while droughts in Australia and poor weather in Europe have tightened supplies, leading to the lowest stock-to-use ratios for grains in a decade. Higher crude oil prices have also put upward pressure on farm input costs such as fuel and fertilizer. In Canada, a stronger dollar relative to the U.S. dollar moderated price increases for most agricultural commodities and food.

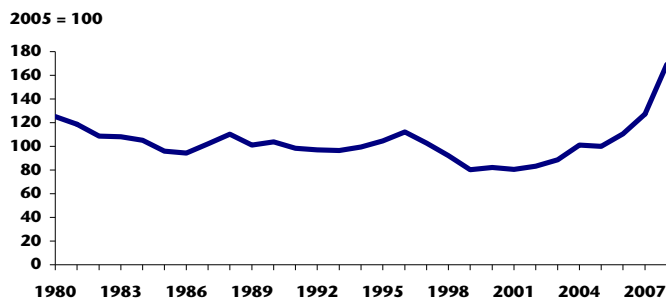


## Global commodity prices have risen in 2007 and 2008 after several years of decline

- **The World Food Price Index roughly doubled between 2002 and 2008.**

During the first half of 2008, world food prices were 33% higher than in 2007.

**Chart A1.1**  
World Food Price Index,  
1980-2008



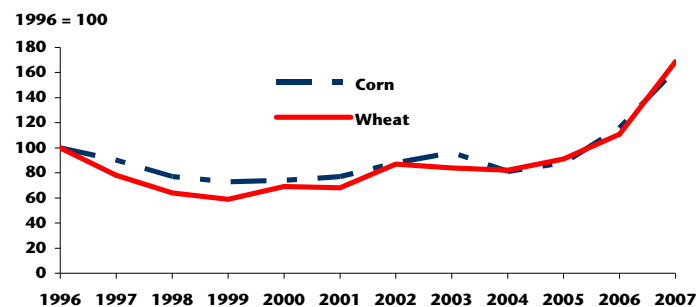
Source: International Monetary Fund (IMF).

Note: 2008 data reflects prices as of June 2008.

- **Corn and wheat prices have seen strong growth in recent years.**

Corn prices rose 84% between 2002 and 2007, while wheat prices rose 94%.

**Chart A1.2**  
Corn and Wheat Price Indices,  
1996-2007

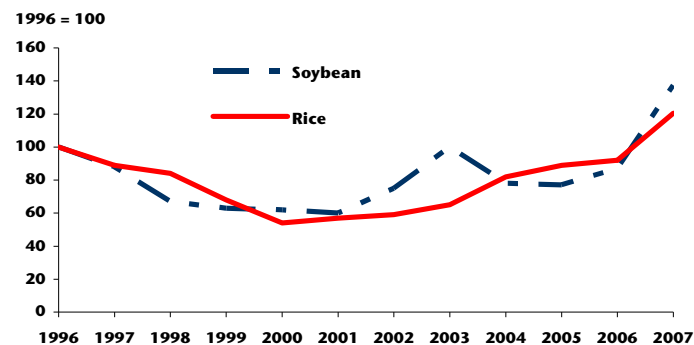


Source: OECD, USDA and AAFC calculations.

- **Soybean and rice prices also exhibited strong growth.**

Soybean prices increased 83% and rice prices increased by 104% between 2002 and 2007.

**Chart A1.3**  
Soybean and Rice Price Indices,  
1996-2007



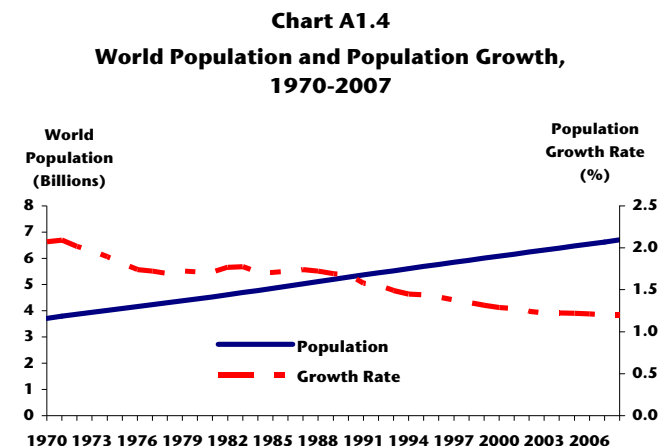
Source: OECD, USDA and AAFC calculations.

## Strong economic growth in emerging economies has led to increased demand for higher value food such as meat and dairy products

- **The world's population continues to grow, but at slower rates.**

The world's population grew from 3.7 billion in 1970 to approximately 6.7 billion in 2008.

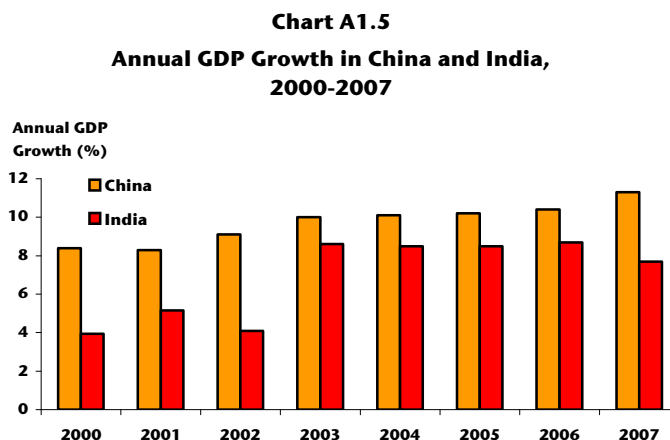
However, annual population growth has slowed from 2.1% in 1970 to roughly 1.2% in 2008.



Source: U.S. Census Bureau.

- **The increase in global demand for commodities is partly due to rising incomes in emerging countries like China and India.**

Annual GDP growth in China has exceeded 10% per year since 2003, while India posted annual GDP growth of 7.7% in 2007, down from 8.7% in 2006.

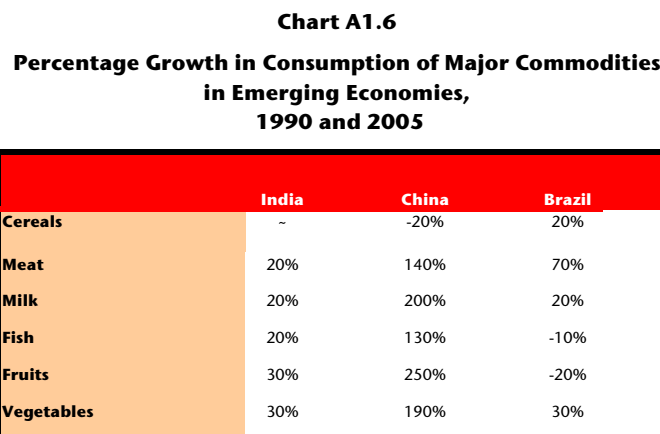


Source: OECD.

- **As incomes in emerging markets have grown, consumption patterns of major commodities have changed.**

Rising incomes have fuelled demand for meat, dairy products, fish, and fruits and vegetables. In China, for example, consumption of meat and milk grew by 140% and 200%, respectively, between 1990 and 2005.

Growing consumption of meat and dairy products in emerging economies has also created greater demand for animal feed, putting further pressure on grain prices.



Source: International Food Policy Research Institute.

Emerging markets include those countries which in the past were classified as developing economies, but have more recently emerged with strong annual economic growth and greater roles in the global economy. This group includes India, China, and Brazil, among others.

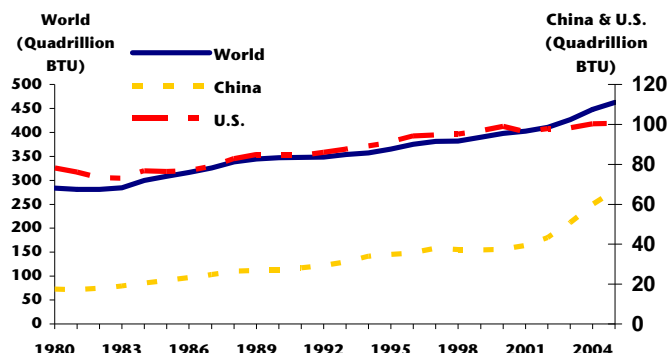
## World energy consumption and population have also grown steadily

- **Emerging markets are rapidly catching up with developed nations in terms of energy consumption.**

World energy consumption increased 63% between 1980 and 2005, but even more rapidly in emerging markets such as China, where it increased by 283% over this period.

China is quickly catching up with the U.S., the world's largest energy-consuming nation.

**Chart A1.7**  
World Primary Energy Consumption (BTU),  
1980-2005



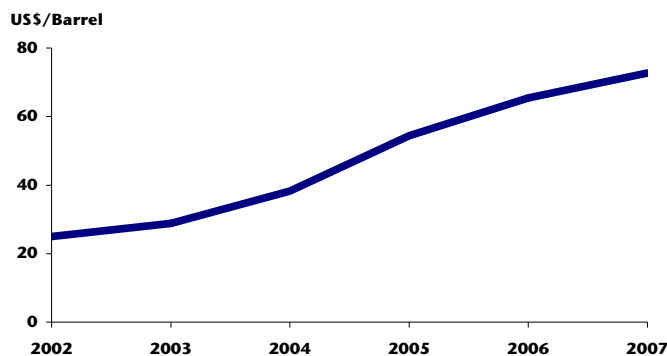
Source: Energy Information Administration.

- **Rising energy consumption has contributed to higher crude oil prices.**

Crude oil prices climbed from \$US25 per barrel in 2002 to \$US72 per barrel in 2007, and reached over \$US140/barrel in mid-2008.

Higher energy prices enter directly into farmers' costs of production, increase transportation costs and indirectly affect prices of other inputs.

**Chart A1.8**  
World Crude Oil Prices, 2002-2007

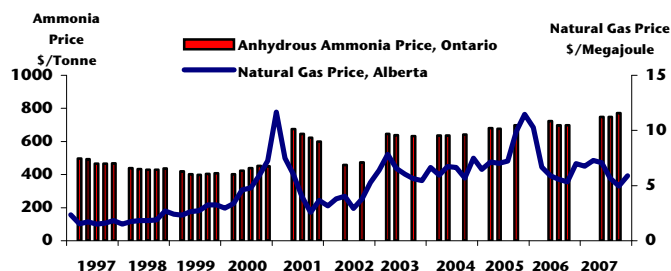


Sources: IMF and AAFC calculations.

- **For example, higher oil prices have also affected the prices of major agricultural inputs, such as fertilizers.**

Fertilizer prices rose by 6% between 2006 and 2007, and to over \$1,074/tonne by mid-2008.

**Chart A1.9**  
Anhydrous Ammonia and Natural Gas Prices,  
1997-2007



Source: Natural Resources Canada and Ridgetown College, University of Guelph.

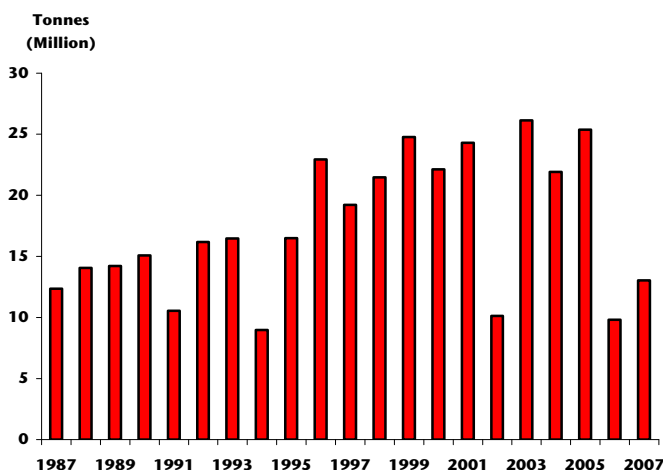
Note: Prices reported per year differ since they are based on the number of times they are surveyed each year.

**Supply side pressures for cereals due to droughts in Australia and poor weather in Europe, in conjunction with growing demand, have led to the lowest stocks in a decade**

- **Weather conditions in Europe and Australia have impacted the global supply of agricultural commodities, which has influenced prices.**

Australia, a major exporter of wheat, was hit with droughts in 2002 and 2006. This contributed to lower world wheat stocks.

**Chart A1.10**  
Wheat Production in Australia, 1987-2007



Source: Australian Bureau of Agricultural and Resource Economics, OECD.

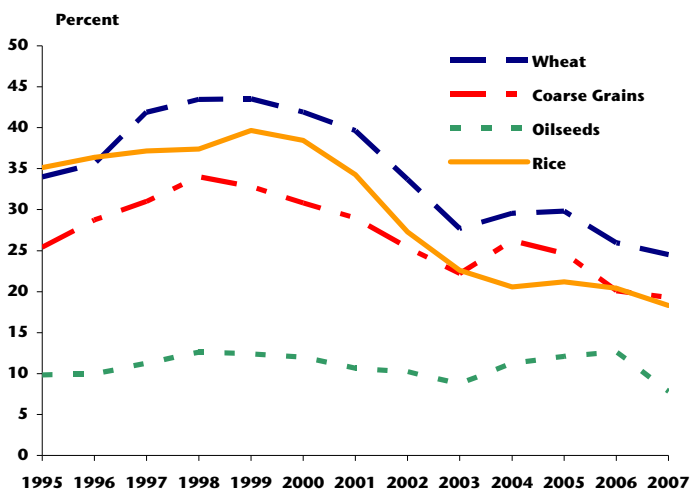
- **Supply and demand pressures have pushed stocks of cereals to their lowest point in over a decade, creating additional pressure on global cereal prices.**

Many countries reduced their public stock holdings of cereals over this period.

Stock-to-use ratios for wheat were 25% in 2007, down from 44% in 1999. Stock-to-use ratios for coarse grains fell to 20% in 2007 from 33% in 1999.

World cereal production increased 22% between 1995 and 2007, while consumption increased 20% over the same period.

**Chart A1.11**  
Stock-to-Use Ratios, 1995-2007



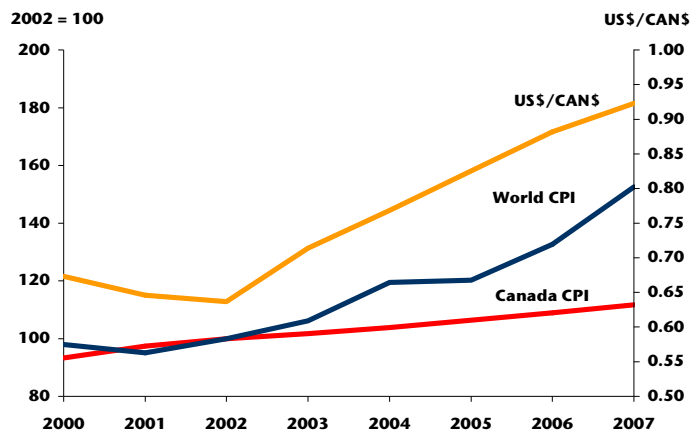
Source: OECD.

## ***In Canada, rising commodity prices have had a limited impact on food price inflation as the appreciation of the Canadian dollar partially moderated food price increases***

- **While world food prices rose sharply in 2007 and early 2008, Canada's retail food prices increased at a moderate pace below other countries.**

A 40% appreciation of the Canadian dollar since 2003 mitigated rising prices of food in Canada.

**Chart A1.12**  
World and Canadian Food Price Indices and U.S./Canada Exchange Rate, 2000-2007



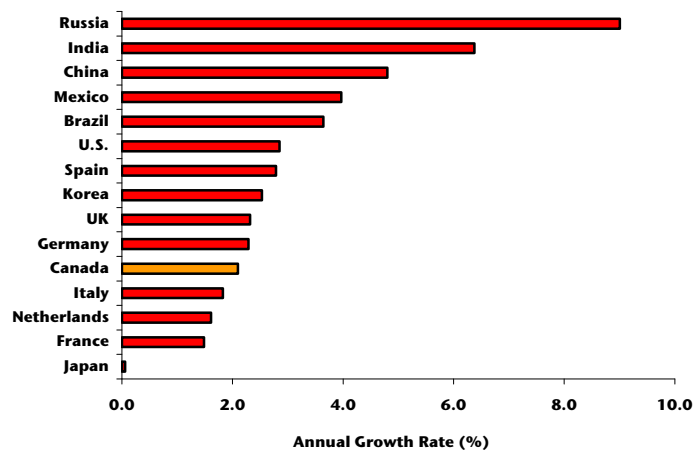
Sources: Bank of Canada; Statistics Canada; IMF.

- **In 2007, Canadian consumer prices rose by far less than in many OECD and emerging nations.**

Canadian consumer prices rose 2.1% in 2007, which was below the 2.9% growth rate in the U.S. and 2.3% in the UK.

Emerging nations generally saw much higher rates of overall consumer price inflation. For example, consumer prices rose 9% in Russia, 6% in India and 5% in China in 2007.

**Chart A1.13**  
Consumer Price Increases for Various Countries, 2007



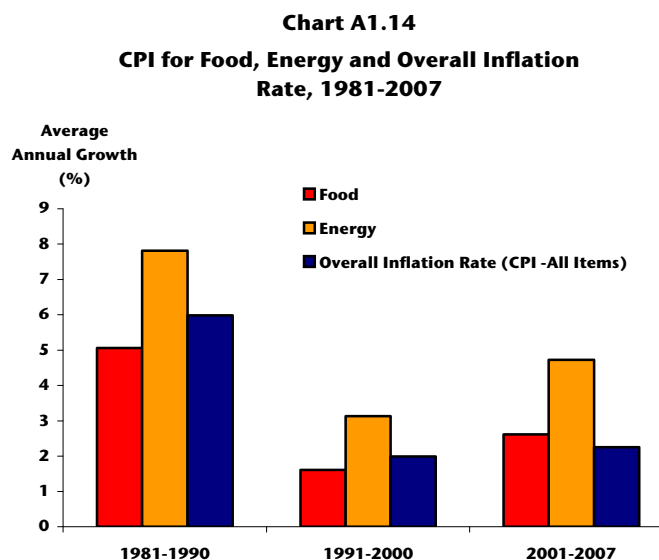
Sources: OECD; National Bureau of Statistics of China.

## Consumer inflation in Canada remains low by historical standards

- **Food price inflation has declined since the 1980s and is comparable to overall inflation.**

Annual food price inflation has averaged 2.6% in the 2000s, which is only slightly higher than the average annual inflation rate of 2.3% for consumer prices overall.

Food price inflation has declined from an annual average rate of 5.1% in the 1980s, when overall inflation averaged 6% and energy price inflation averaged 8%.



Source: Statistics Canada and AAFC calculations.

- **In June 2008, Canada's Consumer Price Index (CPI) for food was 2.8% higher than a year earlier.**

This was below the increase in overall consumer prices of 3.1%.

There was a noticeable increase in the prices of cereal and bakery products, fats and oils and fresh vegetables, which put upward pressure on the CPI for food.

However, fruit prices in early 2008 were down from the same period in 2007 when a freeze in Florida drove up prices.

In addition, prices of beef and pork are taking time to adjust as livestock owners respond to higher feed costs by liquidating herds.

**Chart A1.15**  
Canadian Retail Food Price Inflation by Category, June 2007-June 2008

| Category                               | Inflation (%) |
|--|---------------|
| <b>Overall CPI</b>                     | <b>3.1</b>    |
| <b>Food</b>                            | <b>2.8</b>    |
| <b>Food Purchased From Stores</b>      | <b>3.0</b>    |
| Beef Fresh or Frozen                   | -1.3          |
| Pork Fresh or Frozen                   | 0.7           |
| Poultry Fresh or Frozen                | 2.8           |
| Dairy Products                         | 3.7           |
| Eggs                                   | 2.9           |
| Bakery and Cereal Products             | 13.1          |
| Fresh Fruits                           | -2.8          |
| Fresh Vegetables                       | 1.4           |
| Sugar and Confectionery                | 2.4           |
| Fats and Oils                          | 14.5          |
| <b>Food Purchased From Restaurants</b> | <b>2.5</b>    |

Source: Statistics Canada.

## Canadians are impacted to a lesser extent by rising commodity prices than consumers in many other countries, due to the low budget share for food and more highly-processed food

- **The impact of rising retail prices on Canadian consumers is limited since food accounts for a small portion of household expenditures**

On average, about 10% of total Canadian household expenditures go toward food. This is one of the lowest total household expenditure shares for food, after the U.S. at 7% and the UK at 9%.

Food does account for a higher proportion of expenditures in lower income households in Canada. For example, food accounts for 16% of expenditures in these households (see Chart C1.5).

Canadians also purchase more highly-processed food, for which agricultural commodities constitute a smaller share of the final price. Commodity price increases are therefore mitigated.

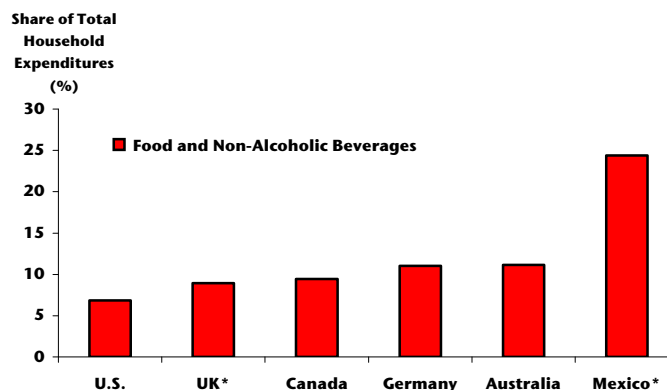
- **Rising food prices have a much larger impact in countries where households generally subsist on low incomes.**

Food takes up a larger share of household budgets in low income countries where large portions of the population live on less than US\$1 per day. Food accounts for well over 60% of total household expenditures.

In light of higher world food prices, this has contributed to increased food insecurity and calls for greater food aid to those regions.

Chart A1.16

Household Expenditure Share of Food and Non-Alcoholic Beverages in Selected OECD Countries, 2006

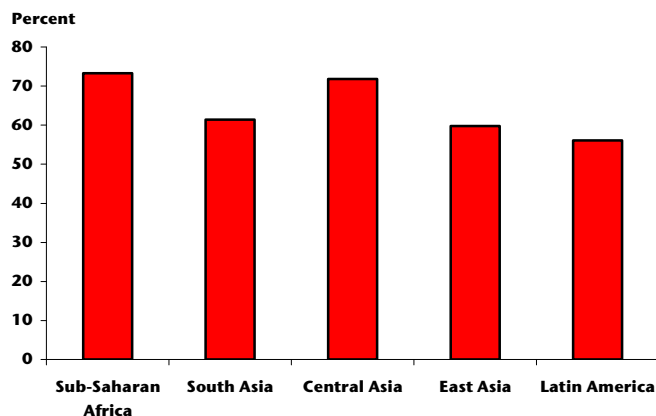


Source: OECD.

\*Note: 2004 figures for Mexico and 2005 figures for the UK.

Chart A1.17

Household Expenditure Share of Food in Developing Countries Living on Less than US\$1/Day, 2006



Source: International Food Policy Research Institute (IFPRI).



## SECTION B

# **The Agriculture and Agri-Food System and the Canadian Economy**







# SECTION B1

## **GDP** **and Employment**

The Canadian agriculture and agri-food system is a complex and integrated supply chain of importance to the Canadian economy. It makes significant direct and indirect contributions to the Canadian Gross Domestic Product (GDP) and employment, but its importance varies from province to province.

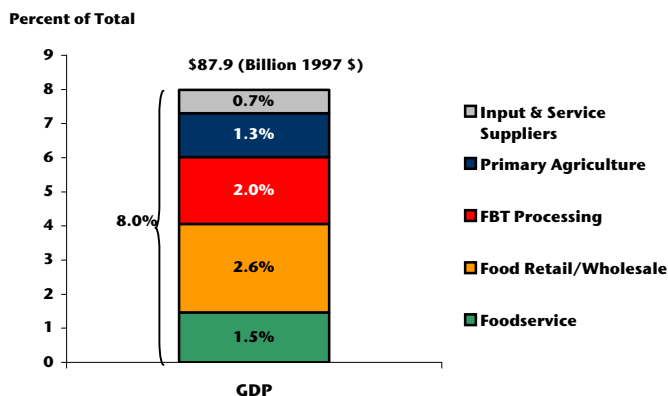
# The agriculture and agri-food system plays a significant role in the Canadian economy

- **The Canadian agriculture and agri-food system accounted for 8% of total Canadian Gross Domestic Product (GDP) in 2006.**

The food retail/wholesale industry was the major contributor to the agriculture and agri-food system's GDP, followed by food, beverage and tobacco (FBT) processing.

Primary agriculture accounted for about 1.3% of national GDP.

**Chart B1.1**  
Agriculture and Agri-Food System's Contribution to GDP, 2006

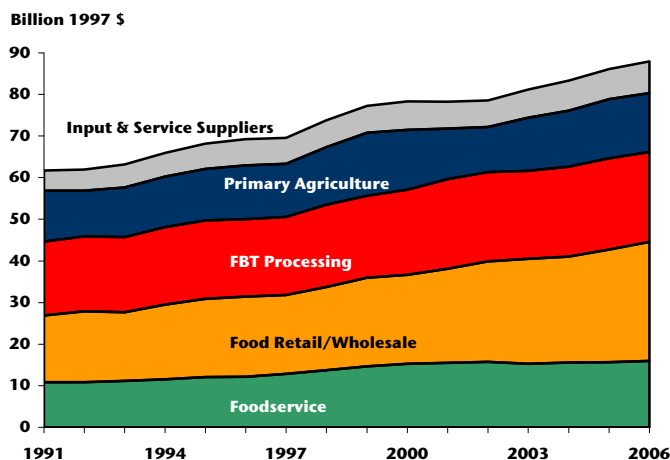


Source: Statistics Canada and AAFC calculations.

- **Since 1991, the overall agriculture and agri-food system has been growing at an average annual rate of 2.4%, which is below the 3.1% growth rate in the overall economy.**

Food retail/wholesale is the fastest growing component, with an average annual growth rate of 4.0%. Primary agriculture and food processing GDP have an average annual growth rate of 1.3% and 1.4%, respectively.

**Chart B1.2**  
Agriculture and Agri-Food System's Contribution to GDP, 1991-2006

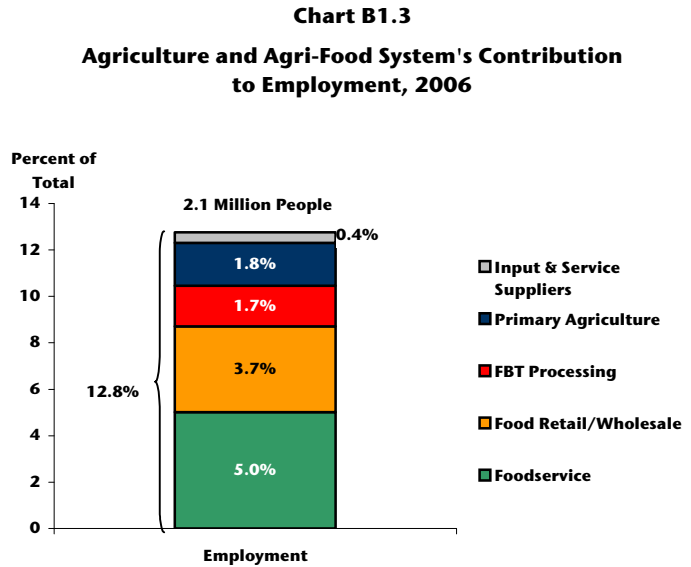


Source: Statistics Canada and AAFC calculations.

**It also makes an important contribution to overall Canadian employment**

- **The Canadian agriculture and agri-food system provides one in eight jobs and employs nearly 2.1 million people. The system also indirectly generates additional employment in other sectors.**

The foodservice industry was the major employer in the agriculture and agri-food system, followed by the food retail/wholesale industry.

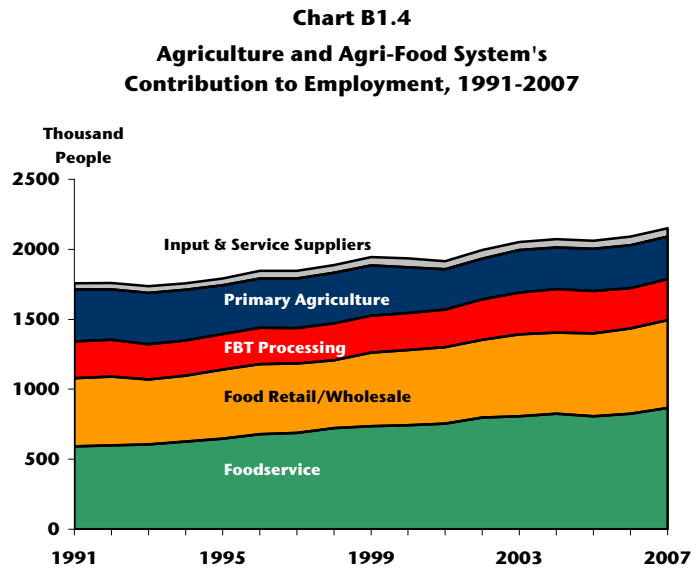


Source: Statistics Canada and AAFC calculations.

- **Employment in the agriculture and agri-food system has been growing at an average annual rate of 1.3% since 1991, which is close to the average annual growth rate of 1.7% in the overall economy.**

Foodservice is the largest employer within the system growing at an average annual rate of 2.4%.

Employment in primary agriculture and FBT processing accounts for similar shares of the agriculture and agri-food system's employment and grew at similar rates. Food processing employment grew at an average annual rate of 0.8%.

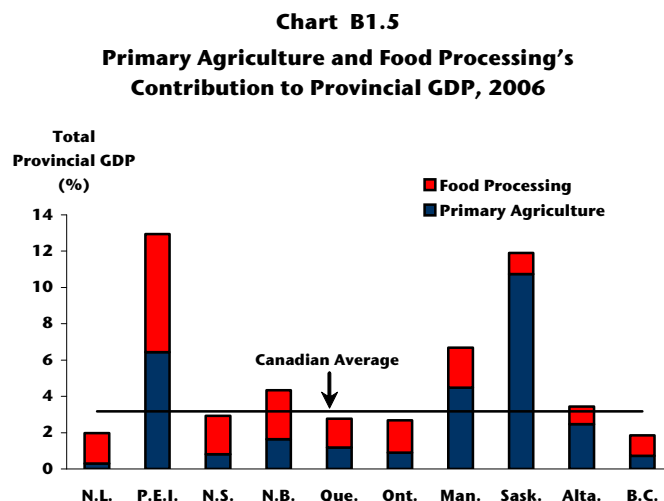


Source: Statistics Canada and AAFC calculations.

## The agriculture and agri-food sector is an important source of income in most provinces

- In terms of contribution to total provincial GDP, agriculture and food processing play the largest role in Prince Edward Island and Saskatchewan, accounting for nearly 13% and 12% of provincial GDP, respectively.

The mix between primary agriculture and food processing also varies across provinces. East of Manitoba, except for P.E.I., food processing accounts for the largest share of provincial GDP. In the Prairies, primary agriculture plays a more important role.



Source: Statistics Canada and AAFC calculations.

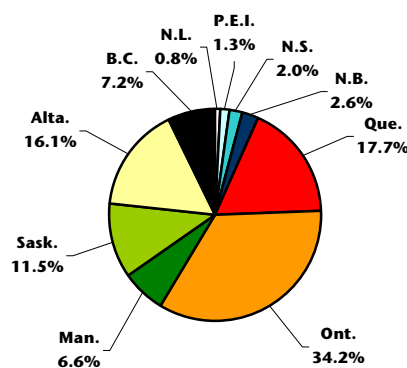
Note: Excludes beverages and tobacco processing.

The contribution of food processing in P.E.I. and N.B. is an estimate.

- The contribution of each province to the total Canadian agriculture and food processing sector GDP varies across Canada.

In 2006, Ontario, Quebec, and Alberta accounted for almost 70% of the total Canadian agriculture and food processing GDP.

**Chart B1.6**  
**Provincial Contribution to Canadian Agriculture and Food Processing GDP, 2006**



Source: Statistics Canada and AAFC calculations.

Note: Excludes beverages and tobacco processing.

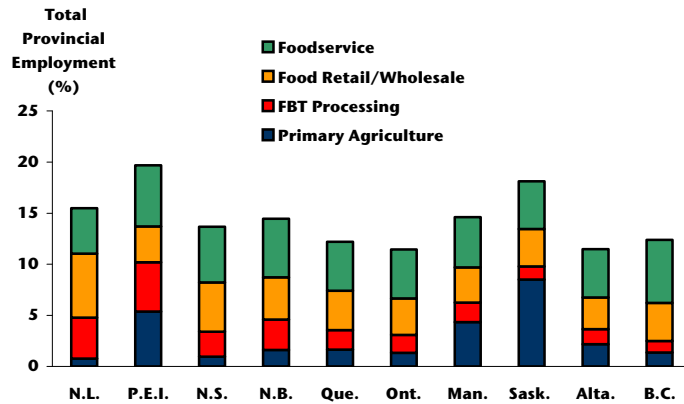
The contribution of P.E.I. and N.B. is an AAFC estimate.

**The agriculture and agri-food system is also a major employer in provincial economies**

- **The agriculture and agri-food system accounts for the largest share of provincial employment in Prince Edward Island and Saskatchewan.**

In many provinces, employment in foodservice accounted for the largest share of total employment in the agriculture and agri-food system, with the exception of Saskatchewan, where primary agriculture had the largest share of provincial employment. In P.E.I., primary agriculture was the second most important employer after foodservice.

**Chart B1.7**  
Agriculture and Agri-Food System's Share of Provincial Employment, 2006

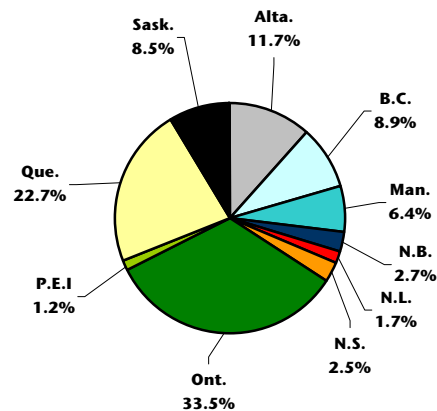


Source: Statistics Canada and AAFC calculations.

Note: Provincial input & service suppliers have been excluded because of reliability and confidentiality data concerns with many of its component industries.

- **Ontario and Quebec make up the largest share of people employed in agriculture, accounting for 56% of the total Canadian food processing sector.**

**Chart B1.8**  
Provincial Contribution to Canadian Agriculture and Food Processing Sector Employment, 2006



Source: Statistics Canada and AAFC calculations.

Note: Excludes beverages and tobacco processing.





## SECTION B2

# International Trade

The success of the agriculture and agri-food sector depends on trade since Canada's domestic market is relatively small. During the past 15 years, Canada has increased its share of world agri-food trade in response to trade liberalization and changing market conditions by producing increasingly processed goods that meet changing market demands. The recent appreciation of the Canadian dollar has led to challenges for the sector, such as declining export demand and increased competition from emerging economies. Nevertheless, agriculture and agri-food exports have continued to grow.



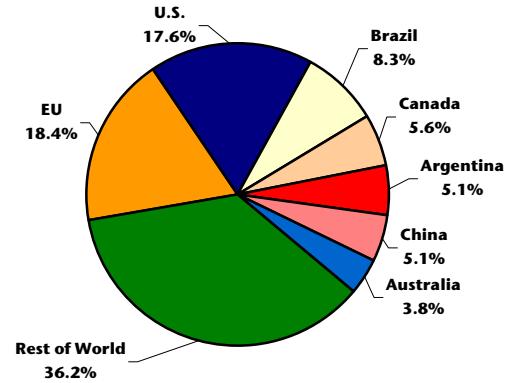
## Canada is a major player in world agri-food trade

- **Canada is the world's fourth-largest agriculture and agri-food exporter**, after the EU, the U.S. and Brazil.

Canada accounts for 5.6% of total world agriculture and agri-food exports if the EU countries are included as a trade bloc.

Canada accounts for 3.1% of total world agriculture and agri-food exports if EU countries are treated separately.

**Chart B2.1**  
World Agricultural and Agri-Food Export\*  
Share by Country of Origin, 2007



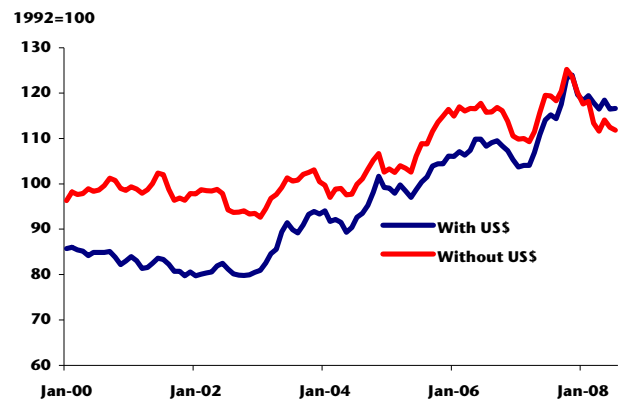
Source: Global Trade Atlas and AAFC calculations.

- \*Notes: 1) Excludes intra-EU trade.  
2) Excludes fresh seafood.

- **The Canadian Dollar Effective Exchange Rate Index (CERI) rose 40% between 2002 and 2007 before falling back partially in 2008.** Much of the overall increase was due to the growing strength of the Canadian dollar against the currency of the U.S. The CERI also rose 25% against other major trading partner currencies, including the Mexican peso, the Japanese yen and the Chinese yuan, between 2002 and 2007.

The CERI is a summary measure of the Canadian dollar's movement against the currencies of important trading partners.

**Chart B2.2**  
Canadian Dollar Effective Exchange Rate  
Index (CERI)\*



Source: Bank of Canada.

\*Basket includes U.S. dollar, Euro, Japanese Yen, Chinese Yuan, Mexican Peso and British Pound.

Agriculture and agri-food exports are defined here as agriculture and processed food, beverage and tobacco products. They include processed seafood but do not include fresh seafood.

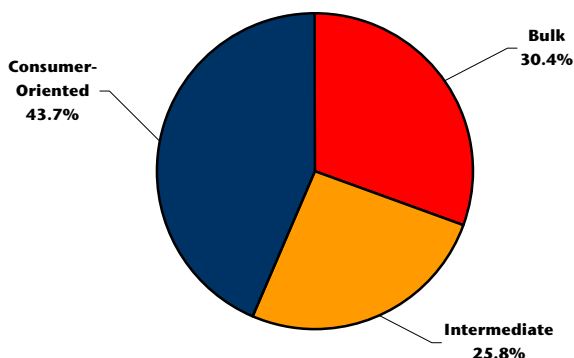
## Trade in agriculture and agri-food products has been driven by consumer-oriented products

- In 2007, consumer-oriented products accounted for \$13.8 billion of total Canadian agriculture and agri-food exports.

The export value of consumer-oriented products has more than quadrupled from \$3.1 billion in 1990. Consumer-oriented products now account for 43.7% of all export sales.

Total Canadian agriculture and agri-food export sales in 2007 were \$31.6 billion, surpassing the previous record peak of \$28 billion in 2006.

**Chart B2.3**  
Canadian Agriculture and Agri-Food Export Sales (BICO)\*, 2007



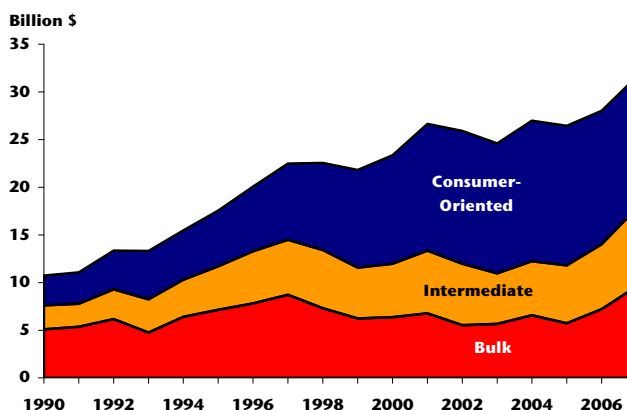
Source: Statistics Canada and AAFC calculations.

\*BICO: Bulk, Intermediate, and Consumer-Oriented.

- Higher commodity prices contributed to a rise in the share of bulk products from 25.7% in 2006 to 30.4% in 2007.

Canada exported \$9.6 billion in bulk agriculture and agri-food products and \$8.2 billion in intermediate products in 2007.

**Chart B2.4**  
Canadian Agriculture and Agri-Food Exports (BICO)\*, 1990-2007



Source: Statistics Canada and AAFC calculations.

\*BICO: Bulk, Intermediate, and Consumer-Oriented.

Consumer-oriented products require little or no additional processing and are generally ready for final consumption. Examples include fresh fruits, vegetables, processed meat and seafood.

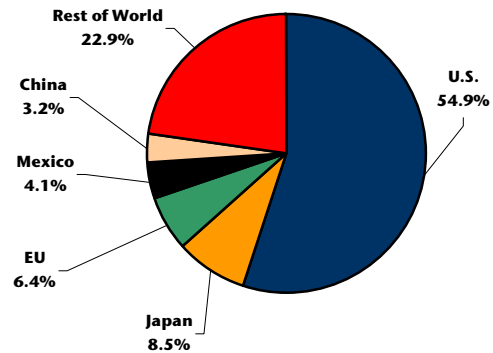
Bulk products have received little or no processing, while intermediate products have received some processing but are not yet ready for final consumption.

**Most of Canada's agriculture and agri-food trade is destined for the U.S. market as North American trade has become increasingly integrated**

- **In 2007, the U.S. accounted for 54.9% of Canada's total agriculture and agri-food export sales in comparison to a 40% share in 1990.**

However, exports to Mexico, the EU and Japan have also increased over time.

**Chart B2.5**  
Destinations of Canadian Agriculture and Agri-Food Exports, 2007

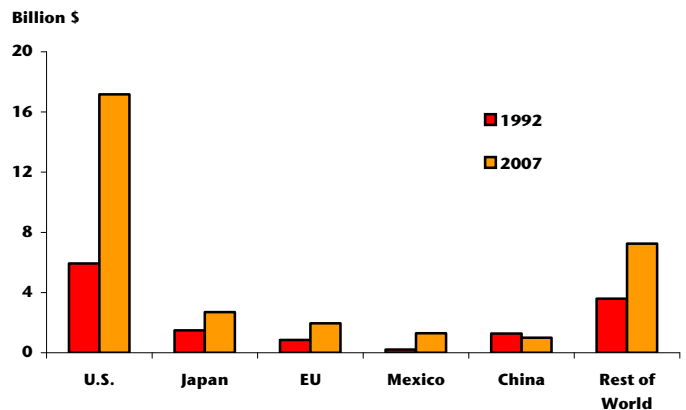


Source: Global Trade Atlas and AAFC calculations.

- **Canadian agriculture and agri-food export sales to the U.S. have nearly tripled since 1992, while those to Mexico have increased sixfold.**

Japan and the EU have also become important export destinations.

**Chart B2.6**  
Value of Canadian Agriculture and Agri-Food Exports by Country of Destination, 1992 and 2007



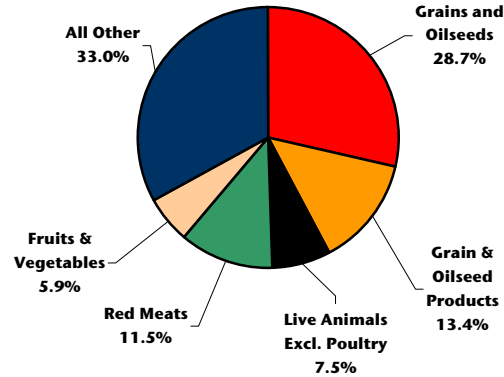
Source: Statistics Canada and AAFC calculations.

**The composition of Canada's export sales has remained fairly constant over the past decade**

- **Grains and oilseeds and their products accounted for 42% of the total value of agriculture and agri-food exports in 2007.**

Red meats and live animals (excluding poultry) were the next largest item in terms of export sales at 19%.

**Chart B2.7**  
Commodity Composition of Export Sales, 2007

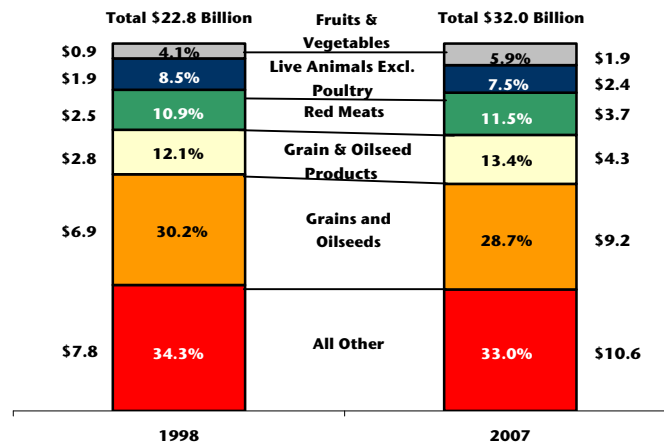


Source: Global Trade Atlas and AAFC calculations.

- **The composition of Canadian export sales has remained relatively constant over the past ten years.**

Red meats, fruits and vegetables, and grain and oilseed products have experienced growth in export sales over the past decade.

**Chart B2.8**  
Commodity Composition of Export Sales, 1998 and 2007

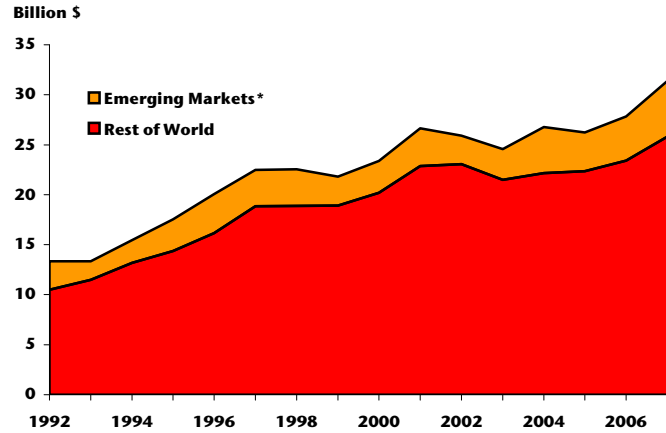


Source: Global Trade Atlas and AAFC calculations.

**Trade with emerging markets is important for the sector**

- **Emerging markets accounted for 17% of Canadian agriculture and agri-food export sales in 2007, up slightly from the 1990s.**

**Chart B2.9**  
Value of Canadian Agriculture and Agri-Food Exports to Emerging Markets\*, 1992-2007

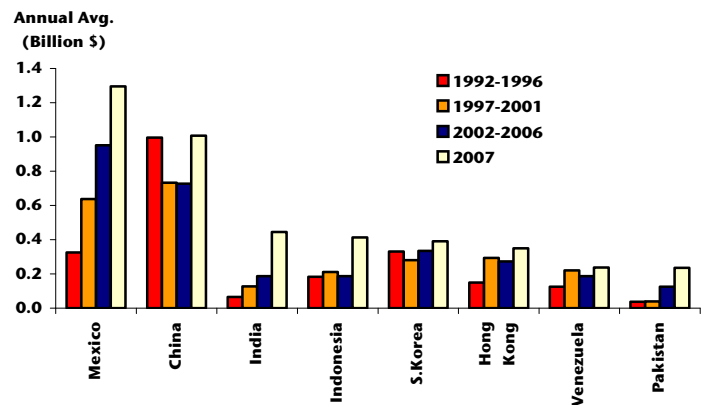


Source: Statistics Canada and AAFC calculations.

- **Canadian agriculture and agri-food export sales to emerging markets more than doubled between the early 1990s and 2007.**

Export sales to Mexico quadrupled between 2007 and the early 1990s, and export sales to India increased sevenfold.

**Chart B2.10**  
Value of Canadian Agriculture and Agri-Food Exports by Emerging Markets\*, 1992-2007



Source: Statistics Canada and AAFC calculations.

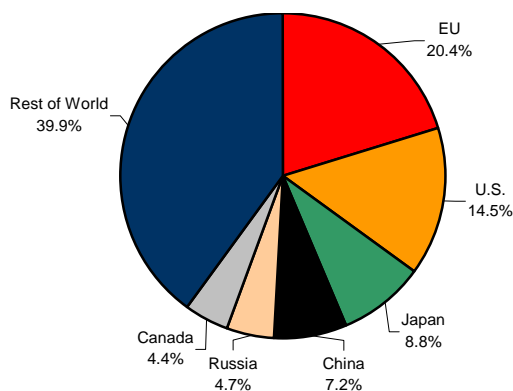
\* Emerging markets generally include countries that have experienced rapid growth over the past decade, such as Mexico, Russia, China, India and Brazil.

## Canada continues to be a relatively large importer of agriculture and agri-food products

- **Canada is the world's sixth-largest agriculture and agri-food importer**, after the EU, the U.S., Japan, China and Russia.

Canada accounts for 2.5% of world agriculture and agri-food imports.

**Chart B2.11**  
World Agricultural and Agri-Food Import\*  
Share by Country of Origin, 2007



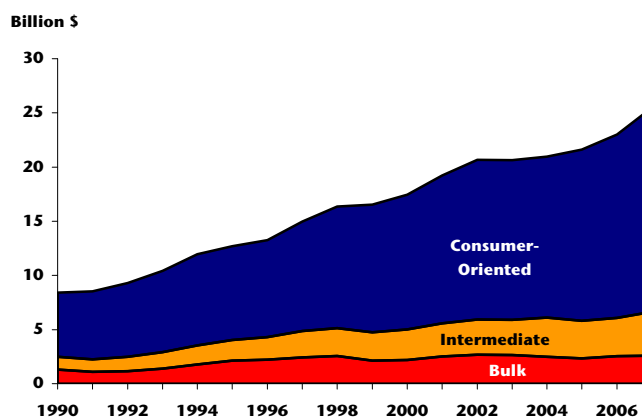
Source: Global Trade Atlas and AAFC calculations.

- \*Notes: 1) Excludes intra-EU trade.  
2) Excludes fresh seafood.

- **Consumer-oriented products make up the majority of Canadian agriculture and agri-food imports**, accounting for 74% of the total in 2007.

In 2007, total Canadian agriculture and agri-food import sales reached a high of \$25.5 billion.

**Chart B2.12**  
Canadian Agriculture and Agri-Food Imports  
(BICO)\*, 1990-2007



Source: Statistics Canada and AAFC calculations.

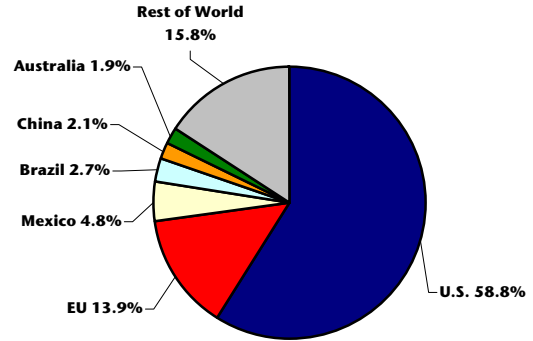
\*BICO: Bulk, Intermediate, and Consumer-Oriented.

## Canada continues to import agriculture and agri-food products from the U.S.

- **The U.S. is Canada's main source of agriculture and agri-food imports**, accounting for 58.8% of the total, followed by the EU with nearly 13.9%.

About 4.8% and 2.7% of our imports come from Mexico and Brazil, respectively.

**Chart B2.13**  
Canadian Agriculture and Agri-Food Imports by Country of Origin, 2007



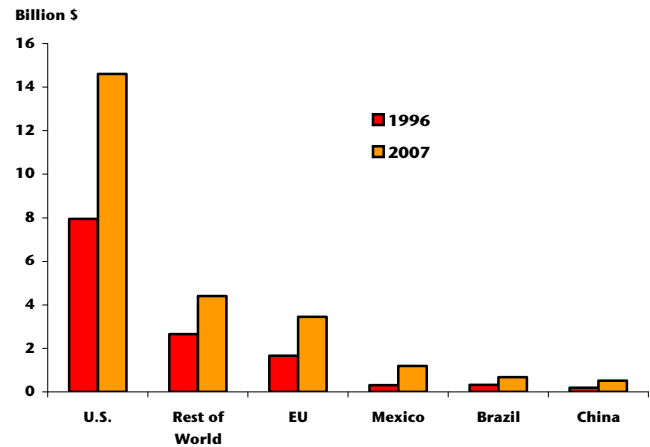
Source: Global Trade Atlas and AAFC calculations.

- **Canada is importing more agriculture and agri-food products from traditional trading partners and emerging markets.**

Emerging markets such as Brazil, Mexico and China are becoming increasingly competitive in international markets.

Imports from Mexico, Brazil and China rose 275%, 111% and 180%, respectively between 1996 and 2007.

**Chart B2.14**  
Value of Canadian Agriculture and Agri-Food Imports by Country of Origin, 1996 and 2007

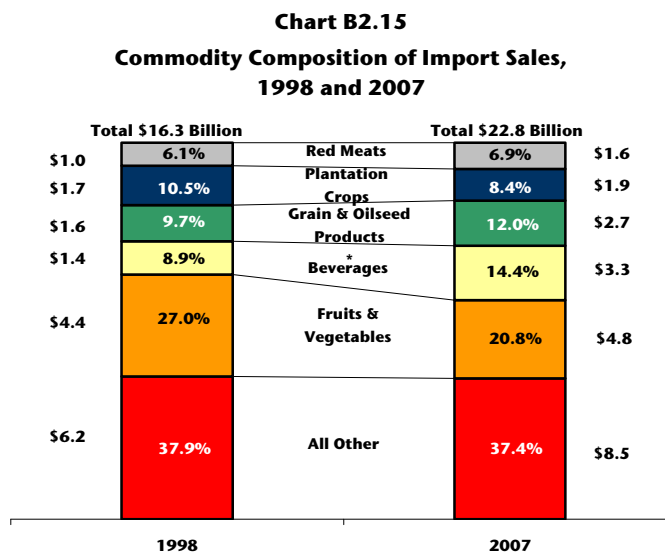


Source: Global Trade Atlas and AAFC calculations.

## The composition and the source of agriculture and agri-food imports has changed over time

- **Fruits and vegetables was the single most important import category in 2007 with a 20.8% share of total imports.** This was down from 27% in 1998.

Alcoholic and non-alcoholic beverage imports grew to 14.4% in 2007, up from roughly 9% in 1998.

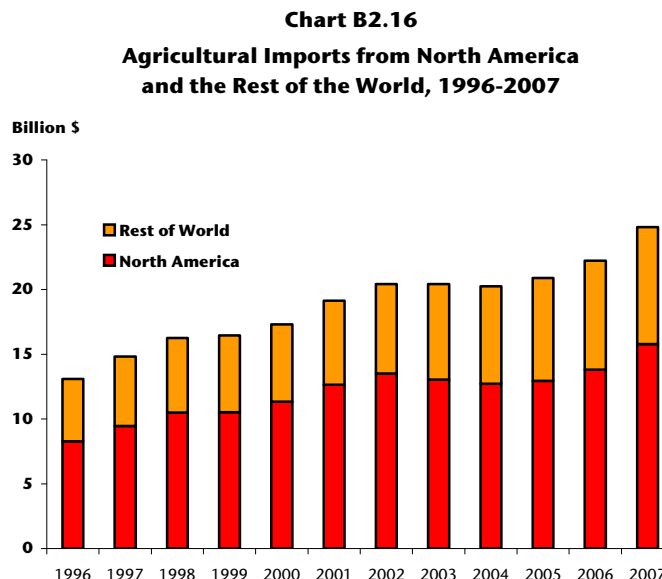


Source: Global Trade Atlas and AAFC calculations.

\*Note: Includes grains and oilseeds and their products.

- **North American Free Trade Agreement (NAFTA) accounts for roughly two-thirds of Canada's imports.**

Imports from NAFTA countries totalled \$15.8 billion in 2007, while imports from non-NAFTA countries reached \$9.0 billion.



Source: Global Trade Atlas and AAFC calculations.

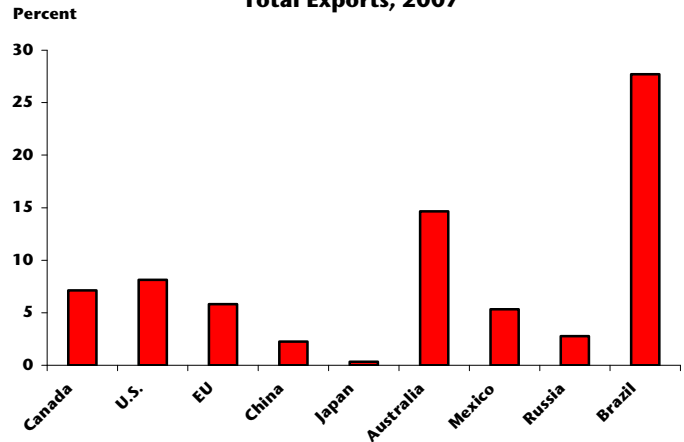


## Canada's agriculture and agri-food trade contributes significantly to Canada's overall trade surplus

- **Agriculture and agri-food exports contributed to 7% of total Canadian export sales in 2007. This share is comparable to 8% in the U.S. and 6% in the EU.**

Total Canadian exports were \$428 billion in 2007. In Brazil and Australia, agriculture and agri-food exports accounted for much larger shares of total exports, at 28% and 15%, respectively.

**Chart B2.17**  
Contribution of Agriculture and Agri-Food to Total Exports, 2007

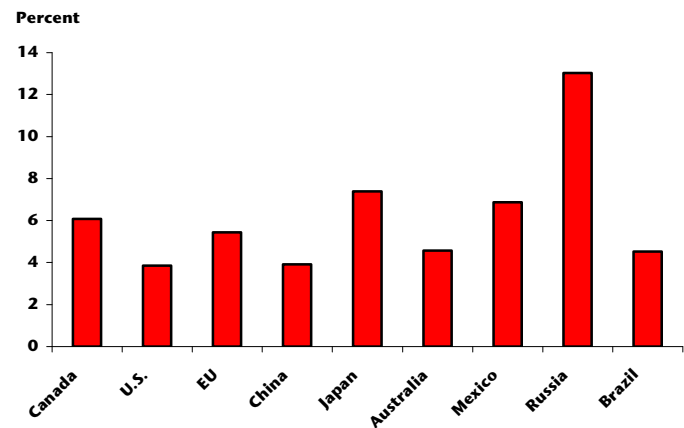


Source: Global Trade Atlas and AAFC calculations.

- **Agriculture and agri-food imports accounted for 6% of Canada's \$387 billion in total imports in 2007. This share was slightly higher than 4% for the U.S. and 5% for the EU.**

In Russia and Japan, agriculture and agri-food imports accounted for much larger shares of total imports, at 13% and 7%, respectively.

**Chart B2.18**  
Contribution of Agriculture and Agri-Food to Total Imports, 2007



Source: Global Trade Atlas and AAFC calculations.



## SECTION B3

### **Productivity, R&D and Innovation**

Innovation is key to the agriculture and agri-food system's productivity growth and long-term prosperity. Innovation improves the manner in which capital and labour inputs are combined, resulting in more efficient and effective production. Innovation has been taking place in the food, beverage and tobacco processing industry, but has been challenged by impediments in developing new products and processes, as well as in commercializing.

## Productivity growth has slowed in recent years in the Canadian agriculture sector

- **Average annual productivity growth in primary agriculture has been high in both Canada and the United States.** However, Canadian agricultural productivity growth has been consistently lower than that in the U.S. Over the 17 years between 1988 and 2004, the average annual productivity growth rate in Canada was 1.2%, while in the U.S. it was 2.0%.

Average annual productivity growth rates in Canada decreased from 1.5% in 1988-1996 to 0.9% in 1997-2004. In the U.S., average annual productivity growth rates were comparable in the two periods.

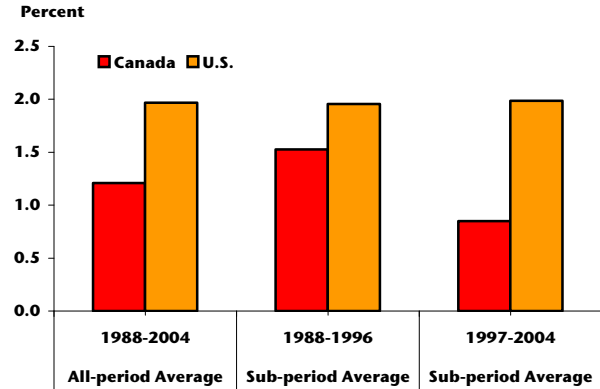
- **Productivity growth in food processing has been low relative to total manufacturing, but increased in recent years.**

Between 1988 and 2004, the average annual productivity growth rate for food processing was 0.1%, compared with a growth rate of about 0.4% for total manufacturing.

Growth rates differed between sub-periods: for food processing, annual productivity growth was -0.1%, on average, between 1988 and 1996. The average annual growth rate increased to 0.4% between 1997 and 2004. This led to an improved productivity performance relative to total manufacturing.

Chart B3.1

### Comparison of Total Factor Productivity Growth in Primary Agriculture: Canada vs. the U.S., 1988-2004

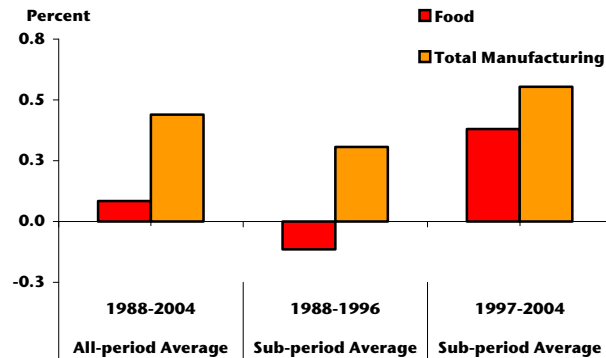


Source: Statistics Canada and U.S. Dept. of Agriculture (Economic Research Service).

Note: This data is geometric mean growth rates, calculated with a gross output measure of total factor productivity growth.

Chart B3.2

### Productivity Growth in Canadian Food Processing and Total Manufacturing, 1988-2004



Source: Statistics Canada.

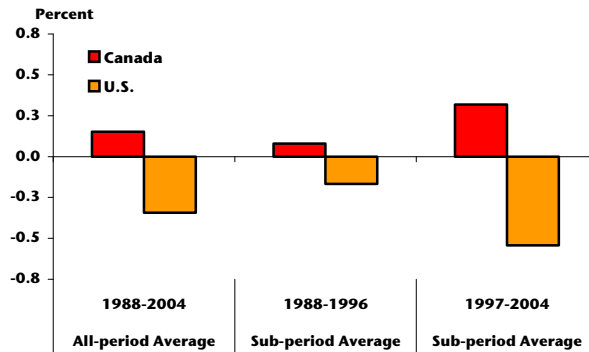
Note: This data is geometric mean growth rates, calculated with a gross output measure of total factor productivity growth.

## Productivity growth has increased in recent years in Canadian FBT processing

- **Since the late 1980s, productivity growth in the Canadian FBT sector has been higher than that in the U.S.** Productivity growth in the U.S. was negative between 1988 and 2004, averaging -0.34% annually. In Canada, the average productivity growth rate was low, but positive, with growth at an average of 0.15% per year.

When viewed in terms of the two sub-periods, it can be seen that over time, the Canadian productivity growth rate improved, while in the U.S., the growth rate declined. In Canada, the increase in the productivity growth rate between 1988 and 1996 came about largely from productivity growth in the beverage and tobacco industries; growth between 1997 and 2004 was largely due to changes in the food industry.

**Chart B3.3**  
Productivity Growth in the FBT Industries, Canada and the U.S., 1988-2004



Source: Statistics Canada, U.S. Bureau of Labor Statistics.

Note: This data is geometric mean growth rates, calculated with a gross output measure of total factor productivity growth. Data for Canada are computed aggregates.

## Productivity growth occurs as a result of innovation

**Chart B3.4**  
**Stages of Technology Development or Innovation**



Source: Adapted from Sustainable Development Technologies Canada (SDTC)  
[http://www.sdtec.ca/en/about/innovation\\_chain.htm](http://www.sdtec.ca/en/about/innovation_chain.htm).

This is a simplified linear version of innovation showing the various stages of development.

**Fundamental Research** — where basic research on a new technological approach or idea is conducted using science.

**Applied Research** — research that addresses a particular problem. The result is technology that shows enough promise technically and in market potential to allow it to garner scale-up support.

**Technology Development** — where research is moved from bench to pilot-stage research on a given technology, requiring various false starts that need correction. The result is a kind of technology that shows enough support to garner support for scale-up and full-scale demonstration.

**Demonstration** — where tests are conducted on first time or early stage technology at full scale under varying conditions to show its range of performance, determine its applicabilities and weaknesses, optimize its operational parameters, and determine its costs. The demonstration stage can be characterized by substantial redesign and debugging until final “robustness” and optimization can be established. Final results may be used to market financial backers and even customers.

**Verification** — where commercial-ready technology is tested and reported on under specific, predetermined protocols designed by stakeholders and quality assurance procedures. Results, if positive, are used for direct marketing purposes.

**Commercialization Scale Up** — to prepare for, finance, and implement full-scale manufacturing and marketing activities, moving from one or a few-of-a-kind to reliably-produced and replicable technology. This often includes developing business plans, entering into partnerships, securing working capital, arranging for manufacturing facilities, and developing channels for:

**Diffusion** —where a full-scale marketing plan for products or technology including interface with appropriate authorities is implemented. This stage is characterized by intensive marketing to all appropriate stakeholders and can be assisted by government through a broad array of tools such as Web sites, targeted conferences, list-serves, and information-targeting state and local authorities.

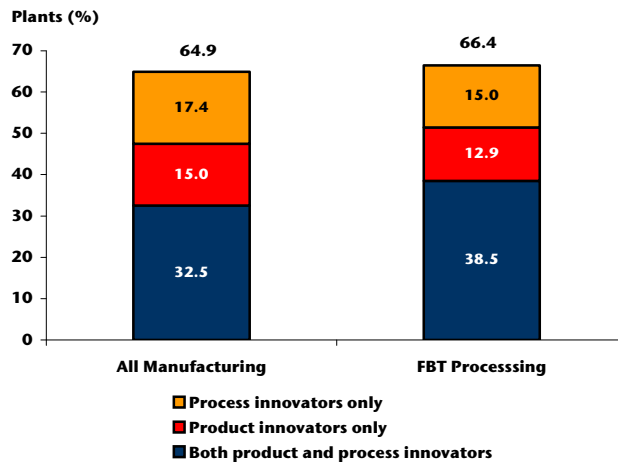
**Utilization** — when the adoption and/or purchase of fully-developed and proven new technology is encouraged by assisting in the flow of information about the technology within the targeted environmental area, acting as “first users”, and by removing regulatory barriers to its implementation.

## Innovation has been taking place in Canadian FBT processing industries

- According to the 2005 Survey of Innovation, about 66% of FBT processing plants and 65% of manufacturing plants introduced product and process innovations in Canada between 2002 and 2004.

More than 50% of the innovative FBT plants introduced new or improved goods, and over 40% of them introduced new or improved manufacturing methods (processes).

**Chart B3.5**  
Extent of Innovations in Canada, 2002-2004



Source: Statistics Canada, Survey of Innovation 2005.

- According to the results from the 2005 Survey of Innovation, the single most important factor impeding innovation in FBT processing is the inability to devote staff to innovation projects.

Uncertain demand for innovative goods or services and markets dominated by established firms were equally important impediments in the commercialization phase of innovation.

**Chart B3.6**  
Impediments to Innovation in FBT, 2002-2004

| Stage/Factors  | Plants % |
|--|----------|
| <b>Development of innovation</b>   |          |
| Inability to devote staff to innovation projects on an on-going basis because of production requirements | 61.0     |
| Lack of qualified personnel to work on innovation projects   | 47.8     |
| Innovation costs too high  | 45.7     |
| <b>Commercialization of innovation</b>   |          |
| Uncertain demand for innovative goods or services  | 57.7     |
| Markets dominated by established firms   | 57.2     |
| Insufficient marketing effort  | 36.9     |

Source: Statistics Canada, Survey of Innovation 2005.

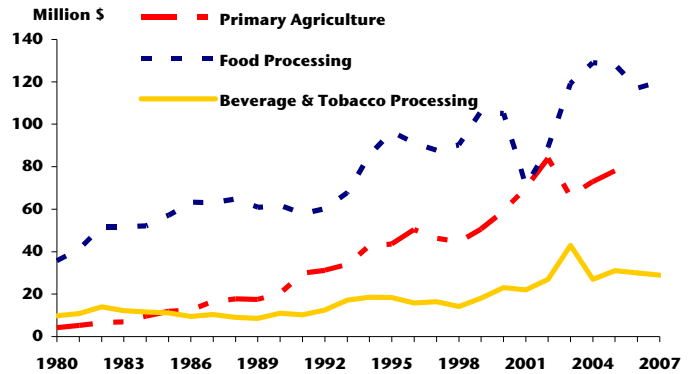
Innovation encompasses several phases that run from ideas to research and development to commercialization, which brings new products and processes to market.

## Both private and public sector research and development spending is a key input required for innovation to take place

- **Private sector R&D expenditure in the agriculture and agri-food sector increased considerably between 1980 and 2000, but has slowed recently.**

Private sector R&D spending in primary agriculture increased from \$66 million in 2003 to \$78 million in 2005. Food processing industry R&D increased since 2003 and fell in 2007.

**Chart B3.7**  
Private Sector R&D Expenditures in the Agriculture and Agri-Food Sector, 1980-2007



Source: Statistics Canada.

Notes: 1) 2005, 2006 and 2007 figures are preliminary.

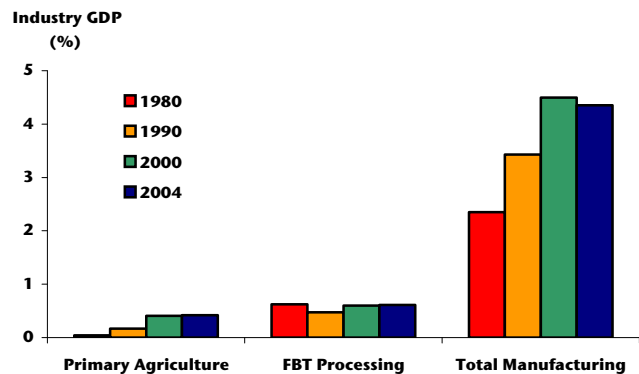
2) This includes all R&D expenditures made by private industry regardless of whether the sources of funds were self-financed, government grants/contracts or from other companies.

- **Private sector R&D spending, as a share of GDP, is considerably lower for primary agriculture and food processing compared to total manufacturing.**

In 2004, 4% of GDP in manufacturing was spent on R&D, compared to only 0.4% in primary agriculture and 0.6% in FBT processing.

Primary agriculture benefits from R&D investments made by input suppliers and by the public sector.

**Chart B3.8**  
Private Sector R&D Expenditures as a Share of GDP by Industry, 1980-2004



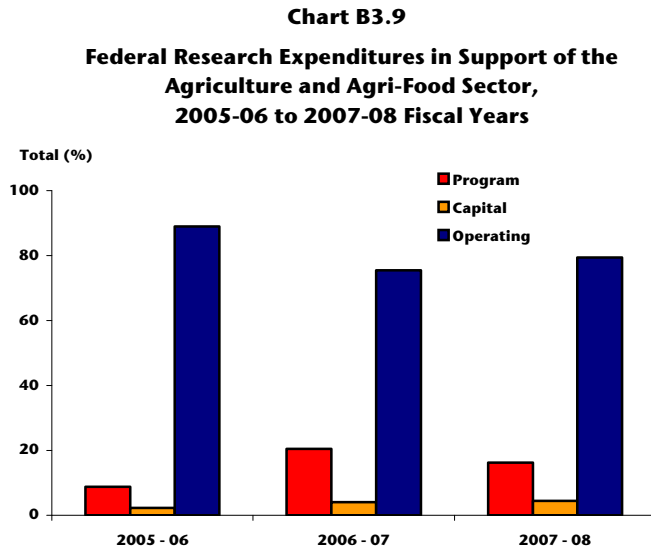
Source: Statistics Canada.

Note: This includes all R&D expenditures made by private industry regardless of whether the sources of funds were self-financed, government grants/contracts or from other companies.

## Public R&D spending in agriculture and agri-food occurs at both the federal and provincial government levels

- **Approximately 80% of federal research expenditures in support of the agri-food sector is allocated to support the operations of research branches and federal research centres.**

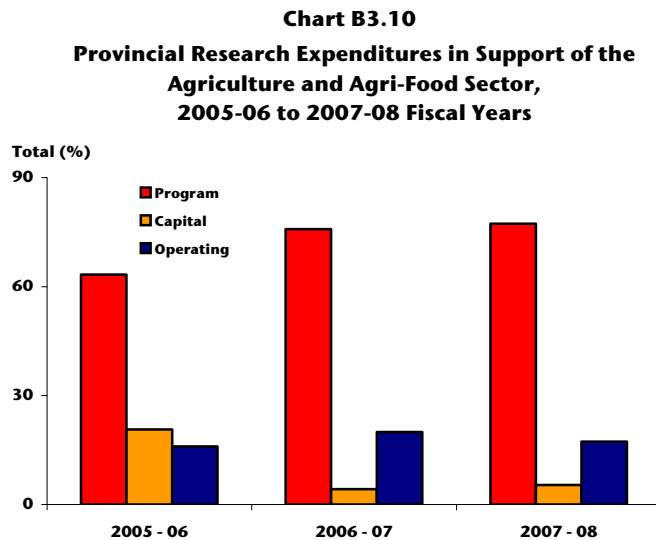
In Canada, a large part of publicly-funded research is carried out by the federal government, including giving grants and contributions to universities and private industry to carry out research.



Source: AAFC, Farm Income, Financial Conditions and Government Assistance Data Book.

- **Over the last three fiscal years, at the provincial level, program expenditures were the most important research expenditure.**

Approximately three-quarters of provincial research expenditures are allocated to grants and contributions provided to universities and scientific organizations for technological development in the agricultural sector.



Source: AAFC, Farm Income, Financial Conditions and Government Assistance Data Book.

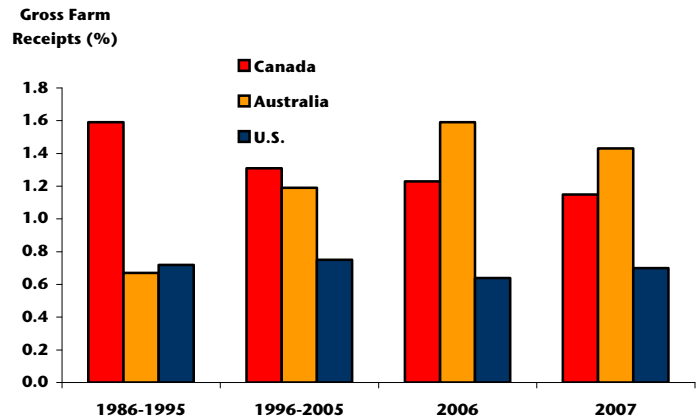


## Public R&D expenditures in agriculture have been declining in Canada and other countries around the world

- **Canada's public R&D spending in the agriculture and agri-food sector declined from 1.6% in 1986-1995 to 1.3% in 1996-2005 and 1.1% in 2007.**

In 2007, public sector R&D, as a share of gross farm receipts, was lower in Canada than in Australia, but higher than in the U.S. The average share in Australia jumped from 0.7% in the 1986-95 period to 1.2% in 1996-2005 and 1.4% in 2007. In the U.S., this share has remained in the 0.7% range over the past twenty years.

**Chart B3.11**  
Public R&D Support to the Agriculture and Agri-Food Sector, 1986-2007

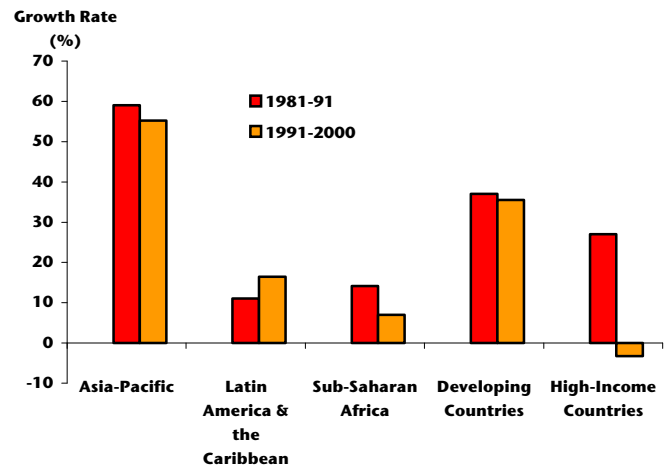


Source: OECD, Agricultural Policies in OECD Countries: At a Glance, 2008.

- **Since the early 1990s, there has been a large contraction in support for public agricultural R&D spending among high-income developed countries, in particular, but less so in emerging countries.**

Growth rates in public R&D spending are nowhere near those of the 1970s, when increased public R&D led to the Green Revolution in Asia and Latin America.

**Chart B3.12**  
Total Public Agricultural Research Expenditures by Region



Source: Pardey, Beintema, Dehmer, and Wood (2006).

## Rates of return on publicly-funded agricultural research have consistently been high in Canada, particularly in the area of crops

- **Canada, like other countries, has experienced high rates of return to publicly-funded R&D on large acreage crops where incremental improvements are magnified over a vast cropping area.**

These high rates of return indicate that more resources could be profitably devoted to agricultural research.

Chart B3.13

### Rates of Return to Canadian Public R&D in Agriculture

|  | Benefit-Cost Ratio | Rate of Return |
|--|--------------------|----------------|
| <b>Wheat</b><br>(Galushko and Gray. 2008)          | 14.83              | 43-53%*        |
| <b>Barley</b><br>(Scott et al. 2005)               | 4.12               | 36.8%*         |
| <b>Pulses</b><br>(Gray and Scott. 2003)*           | ---                | 20.4%*         |
| <b>Canola</b><br>(Boyd, Goddard, and Benkie. 2008) | 6.65               | ---            |

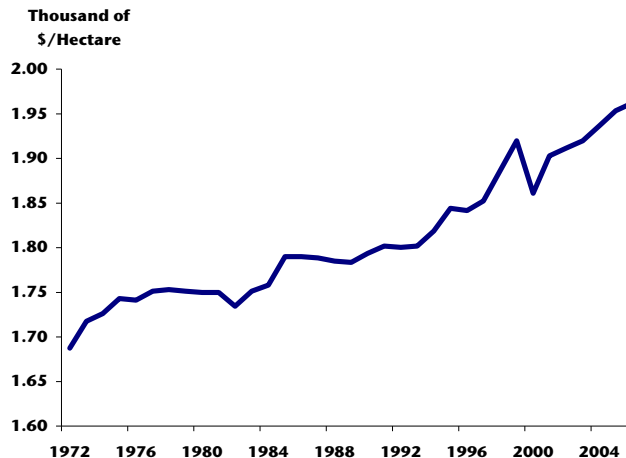
Source: Various.

Notes: 1) \*Calculated jointly with producer check-off and public sector R&D funding for genetics/breeding.  
2) Estimates vary depending on the timeframe and market information used.

- **Genetic improvements, brought about by plant breeding, improved yields of western bread wheats by 16% between 1972 and 2007.**

Chart B3.14

### Wheat Yield Increases Due to Genetic Improvements, 1972-2006



Source: Adapted from Galushko and Gray, 2008 and Statistics Canada.

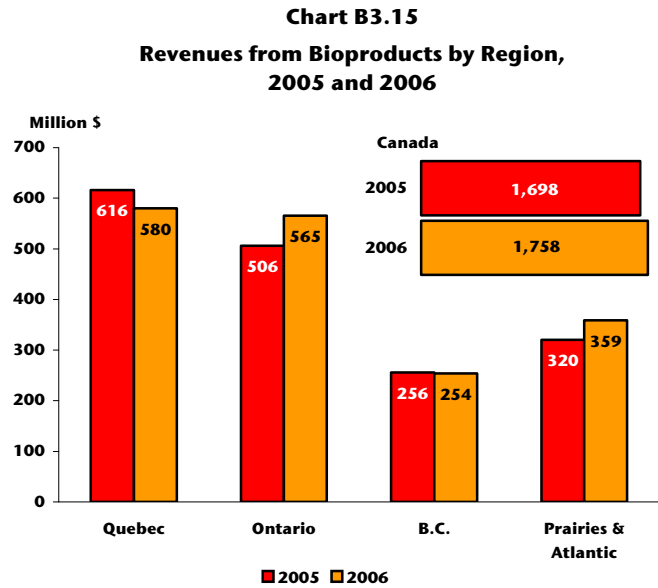
Yield increases attributable-to-genetic improvements were calculated using the *average weighted bread yield index* (Galuschko and Gray, 2008). This index isolates the impact of breeding on wheat yields of the Prairies. The index takes into account the share of wheat types (classes).

**The bioproducts industry is an example of an industry that has experienced growth due to innovation**

- **The Bioproducts industry has been growing.** According to the 2006 Bioproducts Development Survey, 239 firms reported bio-product activities in Canada.

These firms generated \$1.7 billion in revenues, \$828 million in exports, invested \$90 million in R&D and employed 3,900 people.

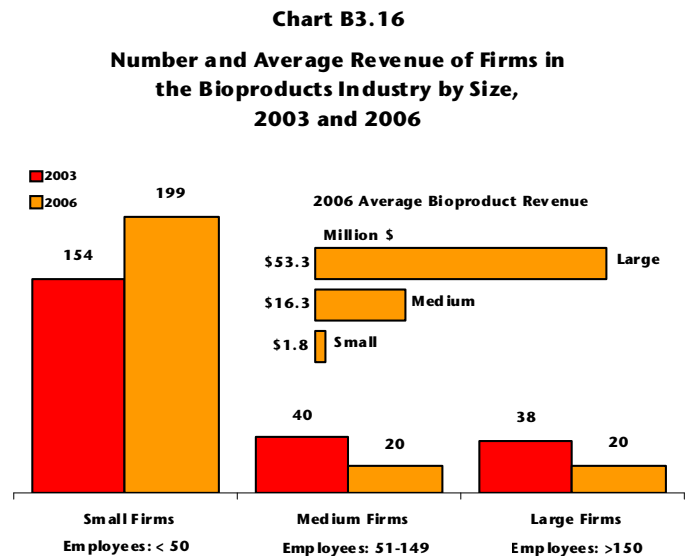
Bioproduct firms in Quebec and Ontario generated the highest revenues.



Source: Statistics Canada, Bioproducts Development and Production Survey 2006.

- **Like many newly-emerging industries, the bioproducts industry is characterized by a high proportion of small and medium-sized firms.** Over 80 percent of firms in the industry are small (less than 50 employees).

The industry's twenty largest firms account for sixty percent of the bioproducts industry revenues (averaging \$53M per firm).



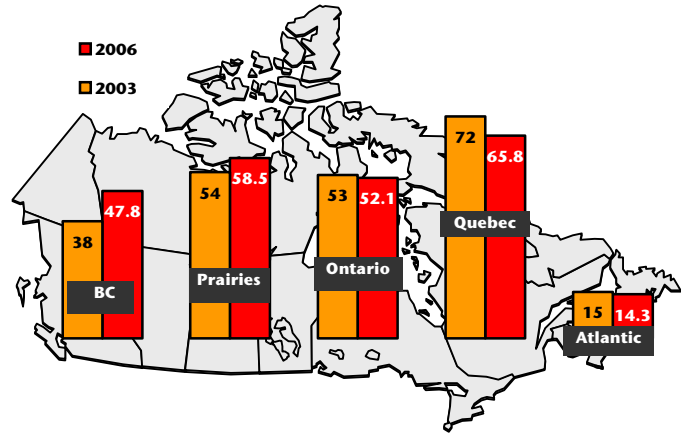
Source: Statistics Canada, Bioproducts Development and Production Survey 2006.

Bioproducts are products (other than food, feed, or medicine) made from renewable biological inputs (often referred to as biomass). The term includes new bio-based products as well as those traditional products which have been adapted to replace non-renewable inputs. Conventionally-made industrial products (such as lumber) are excluded. The term biomass refers to materials sourced from forestry, agricultural (plant, livestock products or by-products) marine, and aquaculture materials, as well as from industrial and municipal wastes.

**The bioproducts industry can be found in all provinces and spans many established industries**

- The bioproducts industry has shifted westward. By the end of 2006, Western Canada was home to 48% of the industry's firms compared to 40% in 2003.

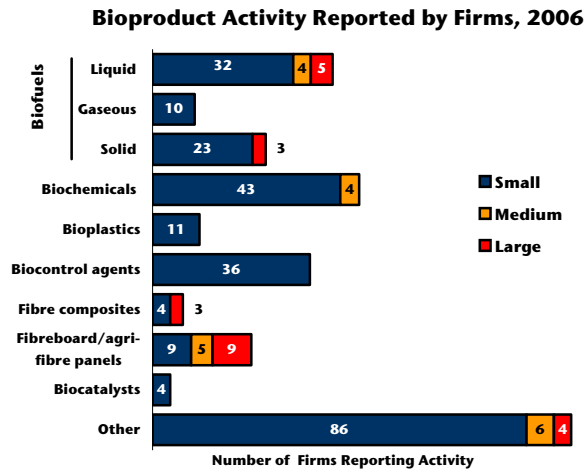
**Chart B3.17**  
Number of Firms Reporting Bioproduct Activity, 2003-2006



Source: Statistics Canada, Bioproducts Development and Production Survey 2006.

- Bioproduct firms reported activity in a wide range of markets including biofuels, chemicals, plastics and composites, fibreboard, biocontrol agents (pesticides, fungicides, herbicides) and biocatalysts. Smaller firms are more diversified while larger firms are specialized.

**Chart B3.18**



Source: Statistics Canada, Bioproducts Development and Production Survey 2006.





# SECTION C

## **Components of the Agriculture and Agri-Food System**





# SECTION C1

## Consumers

Canadian consumers are typical of consumers in developed economies. On average, they allocate a relatively small percentage of their total personal disposable income to food. In fact, for the average Canadian, the food expenditure share is declining.

As incomes increase, consumers are able to look beyond staple foods to product attributes that reflect their divergent preferences and values. In response to consumer demands, the food industry is offering a variety of products which embody not only consumer preferences for convenience and health, but also the methods of production such as those which address environmental, fair trade and animal welfare issues.

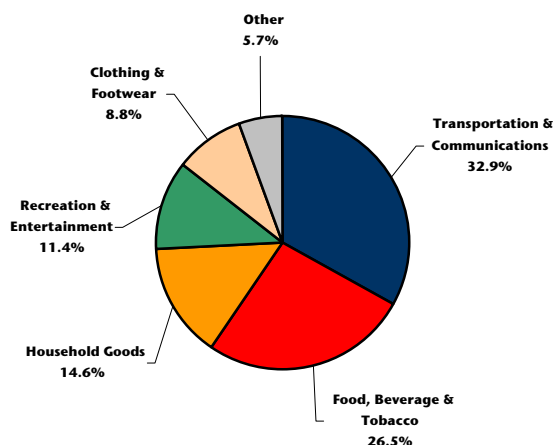


## Canadians spend over \$150 billion each year on food from stores and restaurants

- **Food, beverage and tobacco (FBT) expenditures represent the second largest consumer goods expenditure category.**

In 2007, Canadians spent \$106 billion (or 26.5% of their total personal expenditures on consumer goods) on FBT products purchased from stores.

**Chart C1.1**  
Distribution of Personal Expenditure on Goods, 2007



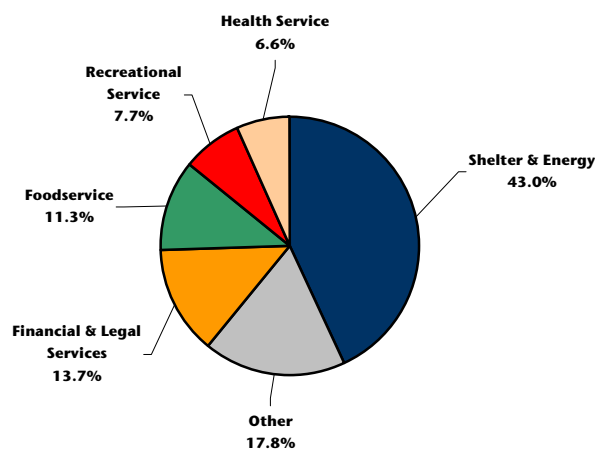
Source: Statistics Canada.

- **Foodservice is the third-largest consumer service expenditure category.**

In 2007, Canadians spent \$50 billion on foodservice, accounting for 11% of personal expenditures on consumer services in Canada.

Together, food expenditures at retail and foodservice establishments (\$156 billion), accounted for 18% of personal expenditures on consumer goods and services.

**Chart C1.2**  
Distribution of Personal Expenditure on Services, 2007

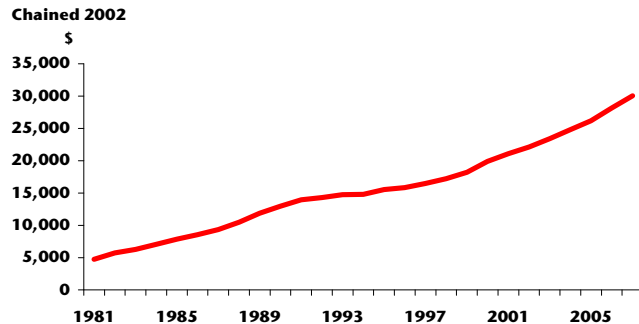


Source: Statistics Canada.

***This is made possible by rising personal disposable income***

- **Real personal disposable income per person continues to grow in Canada, reaching \$30,063 in 2007.**

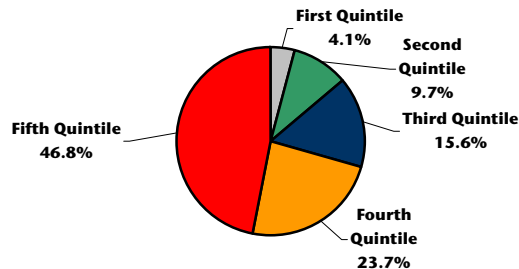
**Chart C1.3**  
Real Per Capita Personal Disposable Income, 1981-2007



Source: Statistics Canada and AAFC calculations.

- **In 2006, the lowest income Canadian households (first quintile) received only 4% of gross personal income while the highest income Canadian households (fifth quintile) received 46%.**

**Chart C1.4**  
Distribution of Gross Household Income by Quintile\*, 2006



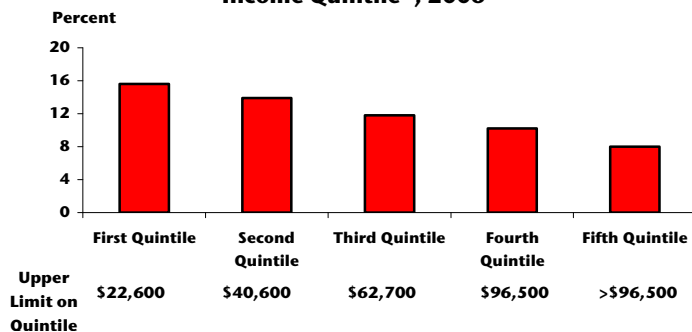
Source: Statistics Canada and AAFC calculations.

\*Quintile: Households are ranked in ascending order by total household income and are divided into five equal groups. The 1st quintile is the lowest 20% of households and the 5th quintile is the highest 20% of households.

- **In 2006, the lowest income Canadians (first quintile) allocated 15.6% of their household expenditures to food at retail. This was the largest share among all income quintiles.**

The highest income Canadians (fifth quintile) allocated only 8% of their expenditures to food at retail.

**Chart C1.5**  
Share of Household Food Expenditures by Income Quintile\*, 2006



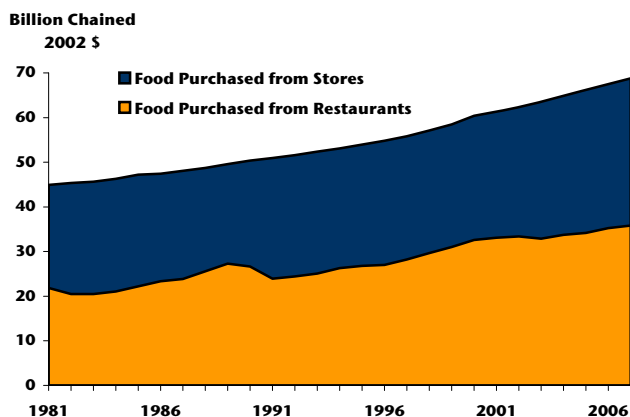
Source: Statistics Canada and AAFC calculations.

\*Quintile: Households are ranked in ascending order by total household income and are then divided into five equal groups. The 1st quintile is the lowest 20% of households and the 5th quintile is the highest 20% of households.

## The share Canadians allocate towards restaurant meals continued to grow in 2007

- **Total real personal expenditures on food from stores and from restaurants continued to rise in Canada in 2007 to \$68 billion and \$35 billion, respectively.** On a per capita basis, food expenditures rose to \$3,183 per person annually with 36% being spent on restaurant meals.

**Chart C1.6**  
Personal Expenditures on Food,  
1981-2007

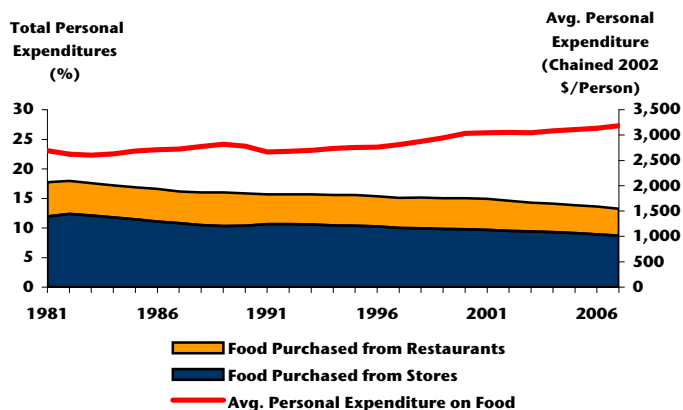


Source: Statistics Canada and AAFC calculations.

- **Although average real personal food expenditure per person has increased, its share of total personal expenditure has been declining for the past 26 years.**

Canadians allocated only 13% of their total spending to food in 2007, down from 17% in 1981. Consumers are spending a greater share of their expenditures on other goods and services such as housing, computers and electronic equipment.

**Chart C1.7**  
Average Personal Expenditures on Food as a Share  
of Total Personal Expenditures,  
1981-2007



Source: Statistics Canada and AAFC calculations.

**However, the largest share of food spending is still spent on food from stores**

- **Almost 75% of all Canadians' meals are sourced from retail stores.**

Commercial foodservice accounts for around 10% of all meals.

**Chart C1.8**  
Where Canadians Source Their Meals, 2007

| Meal Type                | % of Meals |
|--------------------------|------------|
| In-Home—From Retail      | 67         |
| At a Restaurant          | 8          |
| Skipped Meals            | 8          |
| Carried From Home        | 8          |
| All Other Away-From-Home | 7          |
| In-Home—From Restaurants | 2          |

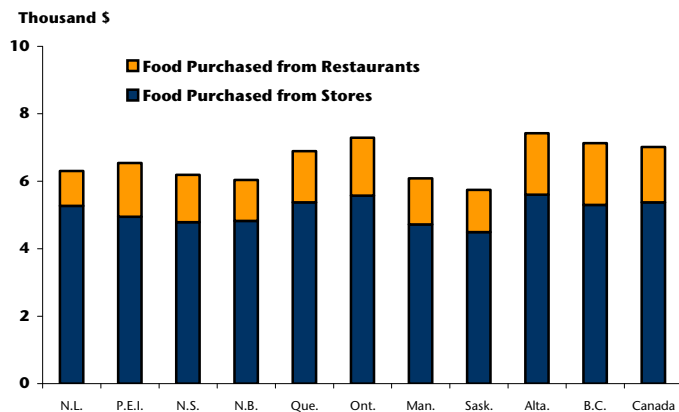
Source: Canadian Restaurant and Foodservices Association.  
(Sourced from National Eating Trends Canada, NPD Group Canada Inc.)

- **The average Canadian visited a restaurant 184 times in 2007, down from 192 visits in 2006. The majority (60%) were visits to quick-service restaurants.**

Residents of British Columbia, Alberta, Prince Edward Island and Ontario spent a larger than average share of their personal food expenditures on restaurant meals than residents of other provinces.

Differences in provincial sales tax (PST) do not explain these differences as restaurant meals under \$4.00 are only exempt from PST in Alberta, Saskatchewan and Ontario.

**Chart C1.9**  
Average Household Spending on Food by Province, 2006



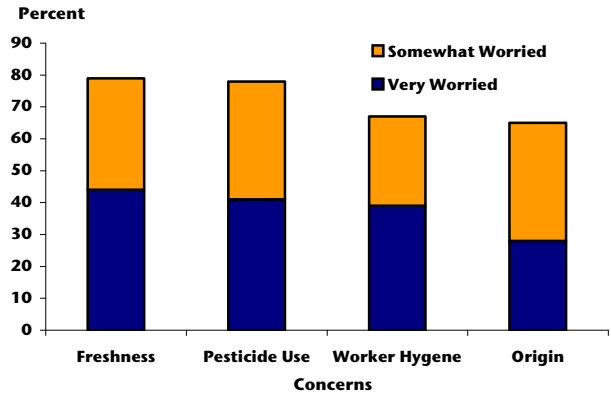
Source: Statistics Canada and AAFC calculations.

Note: Food purchased from stores includes board paid to private households.

**Issues related to food safety and quality, hormone and pesticide use, freshness and sanitation are important to Canadian consumers when buying food products**

- Canadian consumers report that they are concerned with how fruits and vegetables are processed, if pesticides are used or if the produce is fresh.

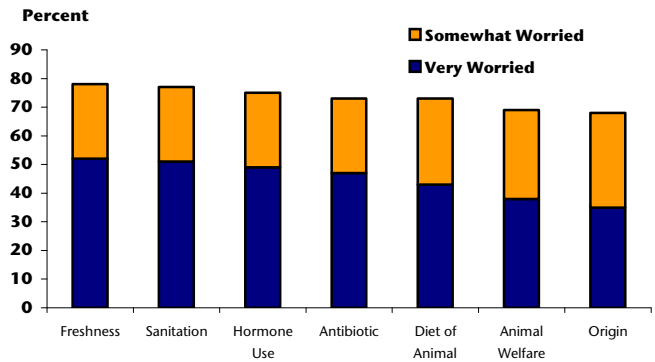
**Chart C1.10**  
**Percentage of Respondants Reporting Specific Concerns When Buying Produce, Canada, 2007**



Source: Canadian Federation of Agriculture (CFA) and Meyers Noris Penny, Canadian Label Project: Branding Canada at Home.

- Canadian consumers report that they are more concerned with freshness, worker sanitation and hormone use when buying red meat and poultry.

**Chart C1.11**  
**Percentage of Respondants Reporting Specific Concerns When Buying Red Meat and Poultry, Canada, 2007**



Source: Canadian Federation of Agriculture (CFA) and Meyers Noris Penny, Canadian Label Project: Branding Canada at Home.



# SECTION C2

## **Food Distribution (Retail/Wholesale and Foodservice)**

Food retail and foodservice are major components of Canada's agriculture and agri-food system. Food retailers are responding to a changing marketplace and changing players (e.g. Wal-Mart) by restructuring to maintain and increase their market share, resulting in increased concentration. Foodservice establishments also continue to adjust product/service offerings to increase sales in response to competition from food retailers who are offering consumers convenience with an increasing variety of prepared food and take-home meals.

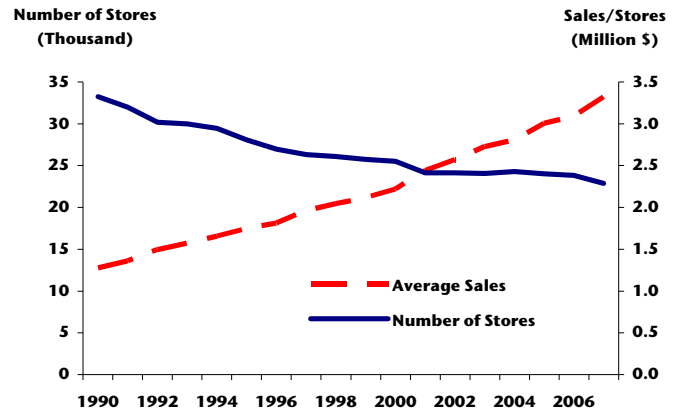
## Food retailing is becoming more consolidated

- **Significant store rationalization has occurred during the past decade, with a move to larger operations.**

The total number of food stores continues to decline, down to 22,870 in 2007. Chain supermarkets and convenience stores account for 60% of food store sales. In 2007, Loblaw's had 1,036 corporate/franchise stores, and Sobeys had 1,332 stores.

The three-largest food retailers in Canada, are Loblaw's, Sobeys, and Metro.

**Chart C2.1**  
Number of Canadian Food Stores and Average Sales, 1990-2007



Source: Canadian Grocer, Statistics Canada, and AAFC calculations.

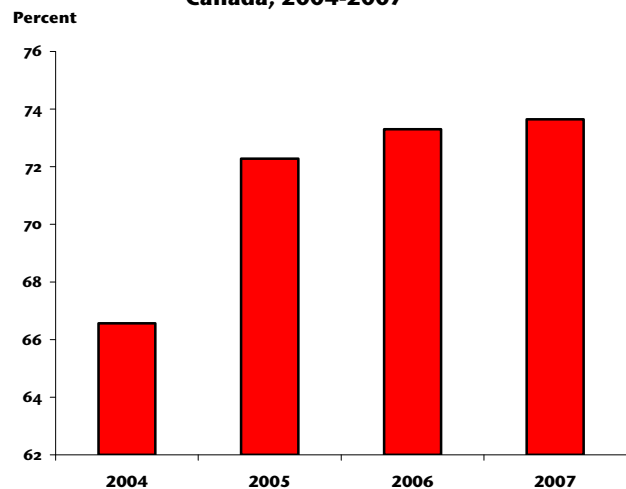
Note: 2007 figures are estimates.

- **Traditional supermarket chains have consolidated as they face increasing competition from well-financed entrants, such as Wal-Mart and Costco.**

The reaction of domestic retailers to new entrants may change the relationship between retailers, processors and farmers.

The market share of the top four food retailers increased from 67% in 2004 to 74% in 2006. Much of this increase can be attributed to Metro's acquisition of A&P in 2005.

**Chart C2.2**  
Market Share of Top 4 Food Retailers in Canada, 2004-2007



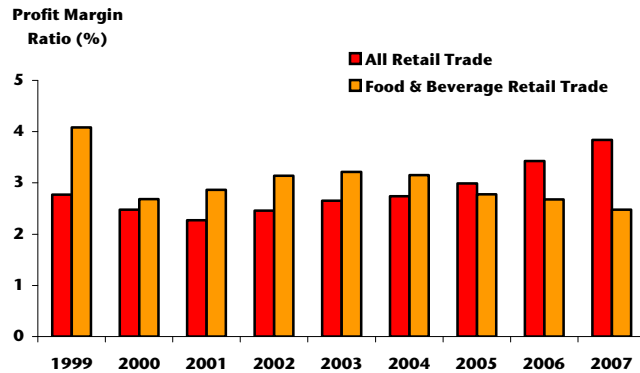
Source: Canadian Grocer and AAFC calculations.

## Canadian food and beverage retailers are experiencing declining profit margins

- **Canadian food and beverage retailers have seen their profit margins fall below those of non-food retailers.**

Food and beverage retailers' profit margins hover around 3% annually. In the early 2000s, food and beverage retailers had higher profit margins than non-food retailers, however since 2005, non-food retailers' profit margins have surpassed those of food and beverage retailers.

**Chart C2.3**  
Average Profit Margin Ratio for Food and Beverage Retailers, 1999-2007



Source: Statistics Canada, Quarterly Financial Statistics for Enterprises.

Note: \*See Glossary for definition of the profit margin ratio and non-financial industries. Does not include government-controlled co-operatives, for example LCBO, SAQ.



## **Lines between food retail and non-food retail, food wholesale and food processing are becoming blurred**

- **Department stores, drug stores and gas stations are increasingly selling food items, while traditional food retailers/wholesalers have expanded their non-food selections.**

Within general merchandise stores, sales of food and beverages were the fastest growing sales category in 2007, growing by 11% since 2006. For the first time, food and beverage became the largest sales category for general merchandise stores.

General merchandisers now account for 10.1% of the food and beverage market, up from 7.4% in 1998.

- **Private label products account for a significant share (21%) of grocery sales, and food retailers continue to focus on the development of private label products to attract and retain customers.**

Development of private label products remains a key competitive strategy for large food retailers. For example, Loblaw's private label sales, such as *President's Choice*, currently account for 24% of Loblaw's sales. Sobeys' private label brand, *Compliments* was launched in 2005, and now includes approximately 4,800 *Compliments* products.

Chart C2.4

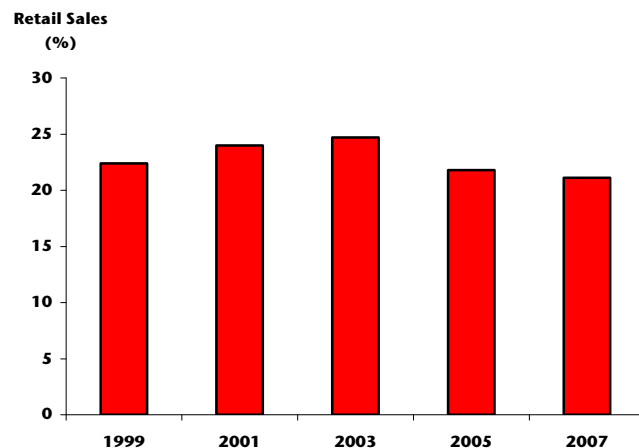
Food and Beverage Sales by Food Retail Channel, 2007

| Retail Channel                      | %    |
|-------------------------------------|------|
| Food and Beverage Stores            | 85.4 |
| General Merchandise Stores          | 10.1 |
| Gas Stations and Automotive Dealers | 2.6  |
| Drug Stores                         | 1.6  |
| Other                               | 0.3  |

Source: Statistics Canada, Quarterly Retail Commodity Survey, Special Tabulation.

Chart C2.5

Private Label Share of Grocery Sales in Canada, 1999-2007



Source: A.C. Nielsen.

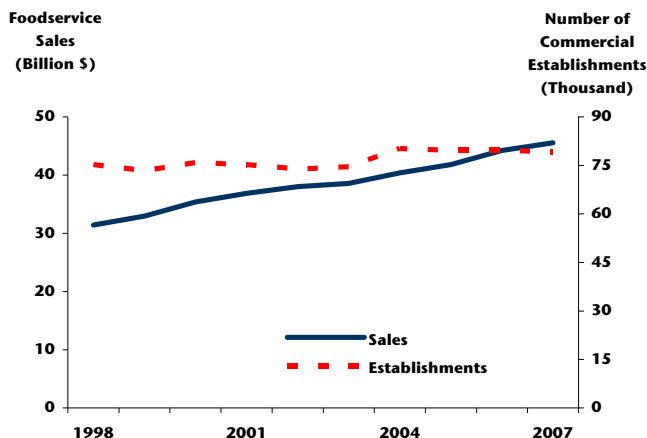
## Foodservice sales continue to grow and bankruptcies are down

- **Commercial foodservice sales have increased by 45% during the last decade, while the number of establishments has stabilized, growing by only 5%.**

Commercial foodservice sales were valued at \$46.6 billion in 2007, representing a 3% increase since 2006.

In 2007, there were around 79,000 commercial foodservice establishments in Canada, of which 39% were in Ontario and 23% in Quebec.

**Chart C2.6**  
Commercial Foodservice Sales and Number of Establishments, 1998-2007

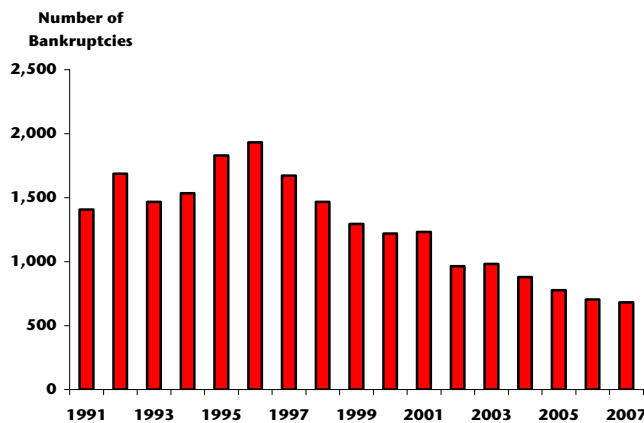


Source: Statistics Canada.

- **Commercial restaurant bankruptcies fell by 3% in 2007 compared to 2006.**

The number of bankruptcies has declined considerably and fairly consistently throughout the last decade or so, from a high of 1,933 in 1996 to 683 in 2007.

**Chart C2.7**  
Commercial Restaurant Bankruptcies, 1991-2007

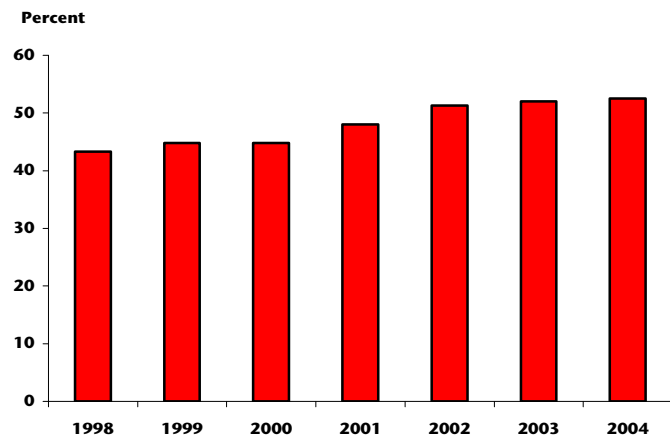


Source: Canadian Restaurant and Foodservices Association, Quarterly InfoStats.

## Canadians have a large choice of foodservice outlets to choose from

- **Consolidation has been occurring in foodservice as well.**

**Chart C2.8**  
Top 50 Foodservice Companies' Share of Commercial Foodservice Sales, 1998-2004



Source: Canadian Restaurant and Foodservices Association.

- **When Canadians eat out, they tend to prefer more to less service.** More than one-third of sales in commercial foodservice occurs at full-service restaurants.

Non-commercial foodservice sales grew by 5% in 2007, faster than the commercial segment, which grew by 3%.

Total foodservice sales (i.e., commercial and non-commercial foodservice) were estimated at \$57.5 billion in 2007.

**Chart C2.9**  
Market Share by Foodservice Category, 2007

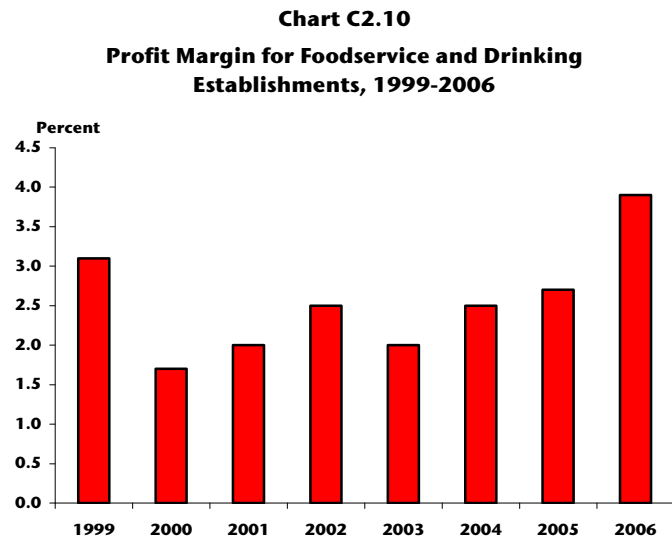
| Foodservice Category                    | %         |
|---|-----------|
| <b>Commercial Foodservice</b>           | <b>79</b> |
| Full-Service Restaurants                | 36        |
| Limited-Service Restaurants             | 32        |
| Contract and Social Caterers            | 7         |
| Pubs, Taverns and Nightclubs            | 4         |
| <b>Total Non-Commercial Foodservice</b> | <b>21</b> |
| Accommodation Foodservice               | 9         |
| Institutional Foodservice               | 6         |
| Retail Foodservice                      | 2         |
| Other Foodservice                       | 4         |

Source: Canadian Restaurant and Foodservices Association and AAFC calculations.

Note: 2007 figures are preliminary.

## As Canadians spend more on restaurant meals, profit margins have risen

- Foodservice and drinking establishments saw an increase in their average profit margin from 2.7% in 2005 to 3.9% in 2006.



Source: Statistics Canada, Financial and Taxation Statistics for Enterprises, Annual.





## SECTION C3

### **Food, Beverage and Tobacco (FBT) Processing**

The domestic food, beverage and tobacco (FBT) processing industry is the link between farmers, retailers, foodservice and consumers (domestically and internationally). This link has become increasingly dynamic as FBT processors integrate with both farmers and retailers (domestically and abroad) to provide consumers with the products they demand. The Canadian FBT industry has faced significant challenges in the last few years as a result of an appreciating dollar and tight labour markets. This has driven up labour costs, created higher input prices for raw materials and increased international competition.

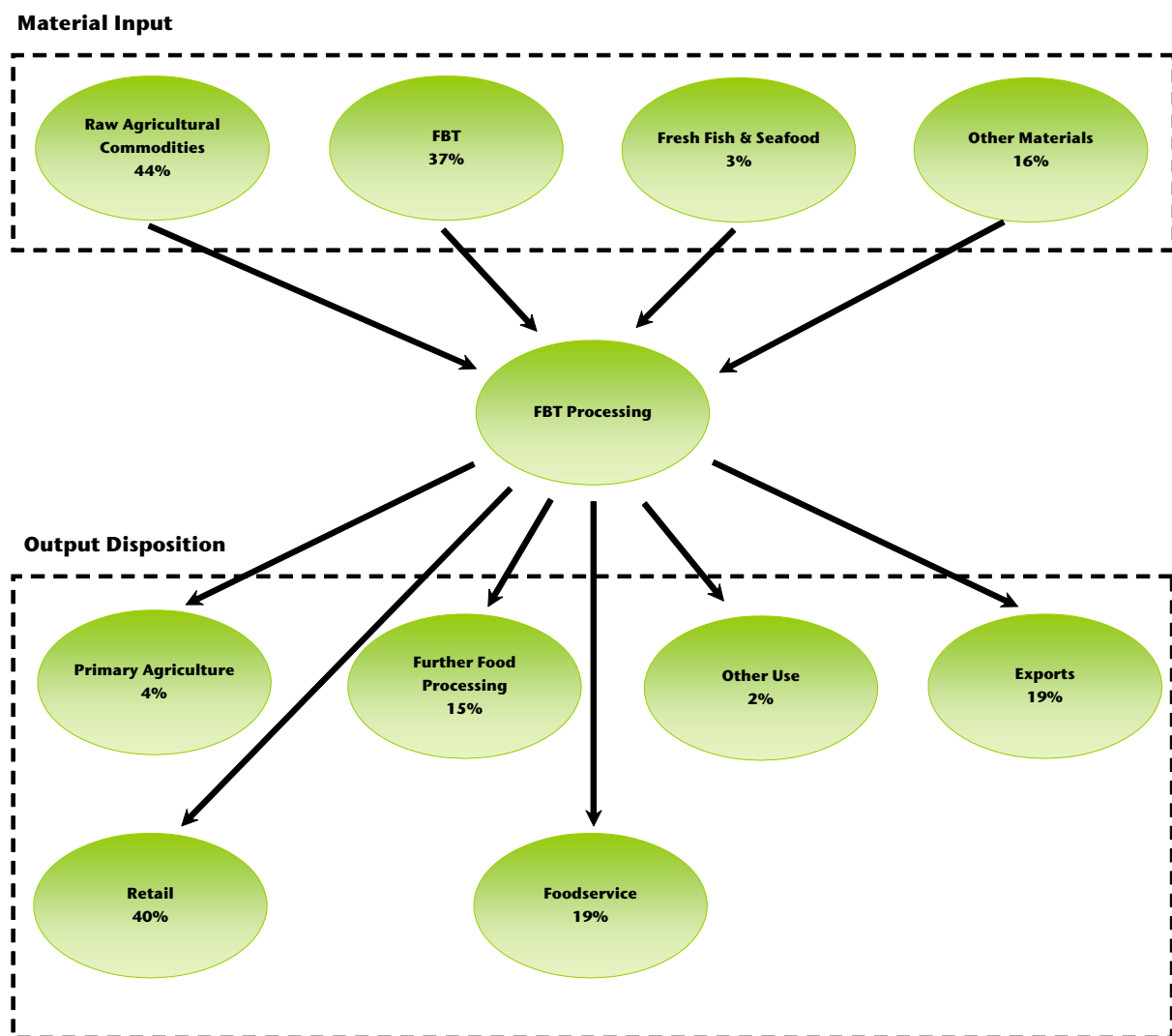
## ***FBT processing is a large varied group that plays a key role in the agriculture and agri-food system***

- **FBT processing is a collection of industries ranging from primary processors, such as flour mills and abattoirs, to further processors, such as bakeries and meat processing plants.**

Agricultural commodities and fresh fish and seafood make up 47% of the total value of material inputs into FBT processing. FBT products that are further processed make up another 37%. The remaining 16% of material inputs is largely made up of packaging materials, energy, chemical additives and equipment.

FBT processing output is primarily sold to food retailers (40%), foodservice providers (19%), exported (19%) or to other FBT processors for further processing (15%).

**Chart C3.1**  
**Food Processing Input Composition and Output Disposition, 2004**



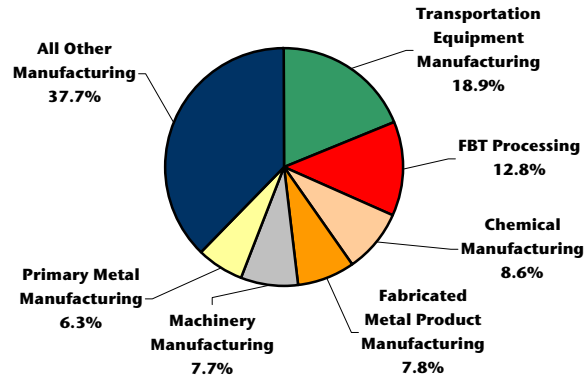
Source: Statistics Canada Input/Output Model and AAFC calculations.  
Note: Does not add up to 100% due to missing confidential data.

## ***FBT processing is one of the most important manufacturing sectors in Canada***

- **FBT processing is the second largest contributor to total manufacturing GDP in Canada, following transportation equipment manufacturing.**

In 2007, FBT processing's share of manufacturing GDP was 12.8%, with food processing alone accounting for 10.3%.

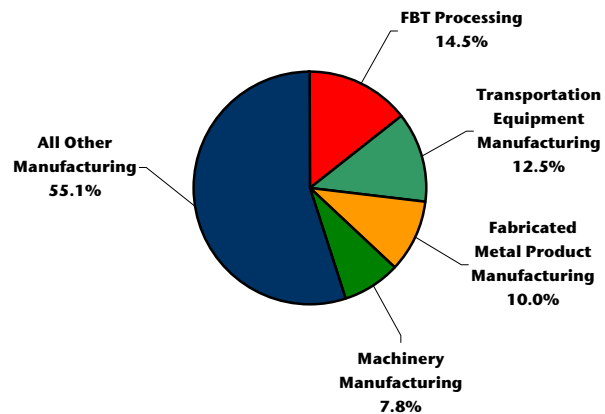
**Chart C3.2**  
Distribution of Total Manufacturing GDP by Sector, 2007



Source: Statistics Canada.

- **FBT processing is the largest manufacturing employer, and accounted for about 14.5% of total manufacturing employment in 2007.**

**Chart C3.3**  
Distribution of Total Manufacturing Employment by Sector, 2007



Source: Statistics Canada, Survey of Employment, Payroll and Hours (SEPH).



## FBT output is slowing

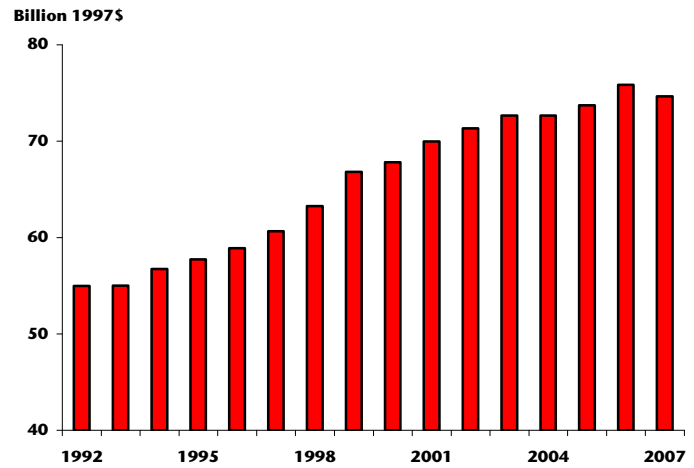
- **After a number of consecutive years of growth, the value of FBT processing shipments fell slightly in 2007.**

However, FBT processing shipments have increased by \$20 billion since the early 1990s.

The largest FBT processing industry is meat product processing, followed by dairy product processing and beverage processing.

Meat and dairy product processing together account for about 40% of the value of FBT shipments.

**Chart C3.4**  
Value of FBT Processing Shipments,  
1992-2007

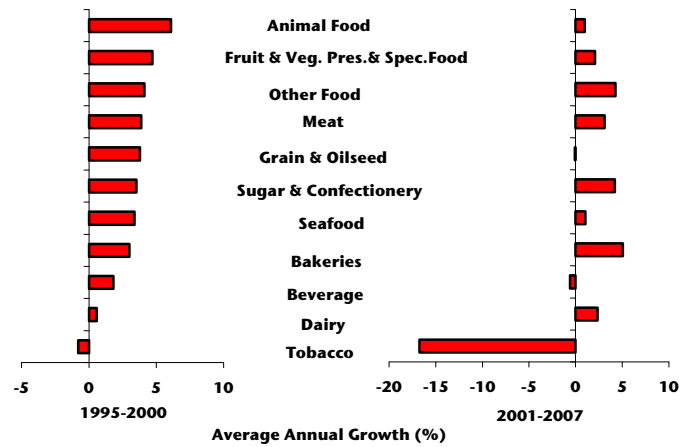


Source: Statistics Canada.

- **Most food processing industries have experienced a slowdown in growth relative to the late 1990s. Notable exceptions are bakeries, dairy processing, and sugar and confectionery.**

Some industries, such as beverage manufacturing have experienced slightly negative growth in recent years, while the tobacco products industry has shrunk significantly due to a major reduction in demand.

**Chart C3.5**  
Growth in Shipment Value in Real Dollars by FBT  
Processing Industry, 1995-2007



Source: Statistics Canada and AAFC calculations.

## Large FBT processing firms account for half of the FBT output

- In 2005, 3,347 FBT processing establishments were operating across Canada, each producing at least \$23,000 in sales.

Large FBT processing establishments (with 200 or more employees) produce the bulk of output. In 2005, they comprised only 10% of the total number of establishments but accounted for 54% of the value of shipments.

In contrast, small establishments (with less than 50 employees) comprised 70% of the total number of establishments, but accounted for only 15% of the total value of shipments.

**Chart C3.6**  
Distribution of FBT Processing Shipments and Number of Establishments by Employment Size, 2005\*



Source: Statistics Canada.

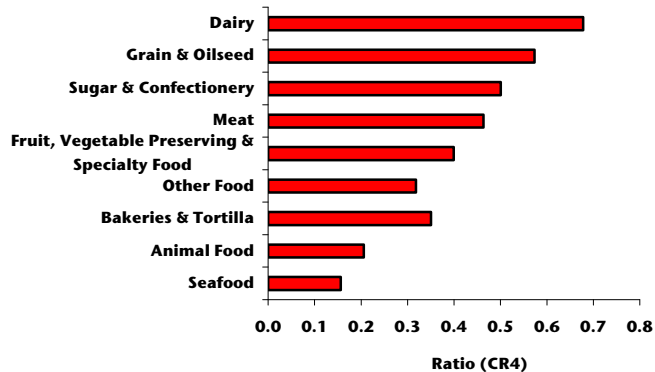
Note: \* This is not comparable to previous information due to changes in definitions.

- Concentration ratios (CR4) in the food processing industry vary from the most concentrated dairy sector to the least concentrated seafood processing sector.

The Canadian food processing industry has undergone significant structural change since the early 1990s and is becoming increasingly consolidated.

The largest players in those industries, with increasing CR4, have consolidated through mergers and acquisitions to achieve greater economies of scale in an effort to remain competitive in the global market.

**Chart C3.7**  
Concentration Ratio (CR4) in Food Processing, 2005



Source: Statistics Canada, Annual Survey of Manufacturing and Logging

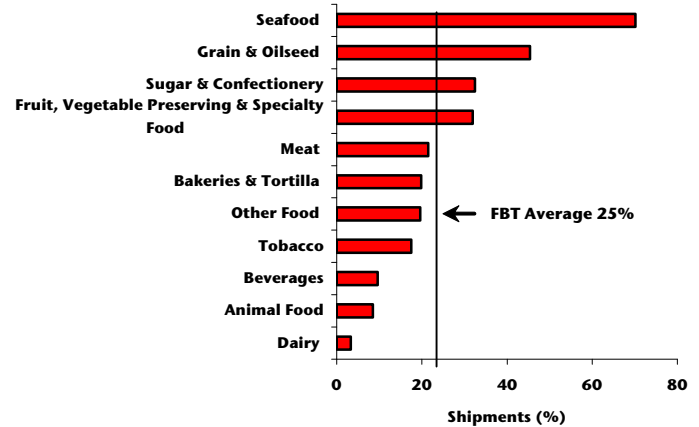
## Some FBT processing industries are more dependent on trade

- **About three-quarters of FBT processing shipments in Canada are destined for the domestic market and the rest are exported.**

However, some sub-sectors are more export-oriented than others. For example, almost three-quarters of seafood products and half of the grain and oilseed products are exported.

In 2007, about 71% of Canadian FBT exports were to the U.S.

**Chart C3.8**  
FBT Processing Export Intensities,  
by Sub-industry, 2007

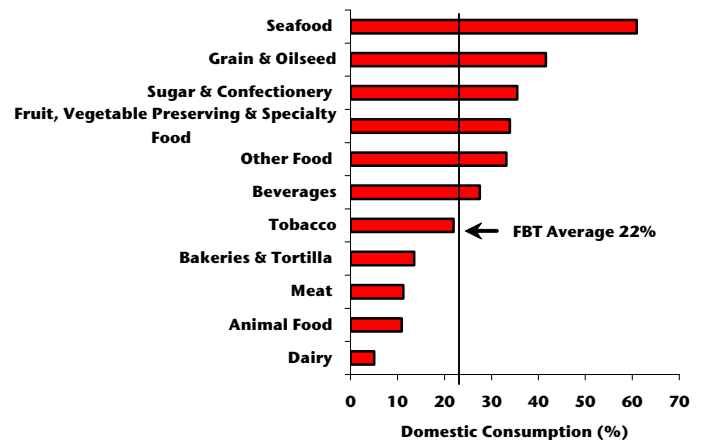


Source: Statistics Canada and AAFC calculations.

- **FBT processors compete with imports for domestic sales. On average, FBT product imports accounted for 22% of the domestic market in 2007.**

In general, those sub-sectors with the highest and lowest export intensities also have the highest and lowest import intensities.

**Chart C3.9**  
FBT Processing Import Intensities,  
by Sub-industry, 2007



Source: Statistics Canada and AAFC calculations.

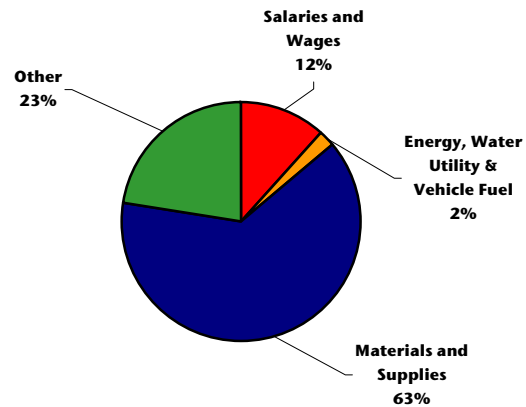
Export intensities measure the share of production (shipments) that are exported.  
Import intensities measure the share of domestic consumption that is imported.

## Rising input costs are squeezing margins in many industries

- **The cost of materials and supplies accounts for two-thirds of the total expenses of food processing establishments. For every dollar of shipments, around 64 cents is spent on materials and supplies.**

Energy, water utility and vehicle fuel cost account for a small percentage (2%) while labour costs account for 12% of total expenses.

**Chart C3.10**  
Variable Input Costs in Food Manufacturing, 2006



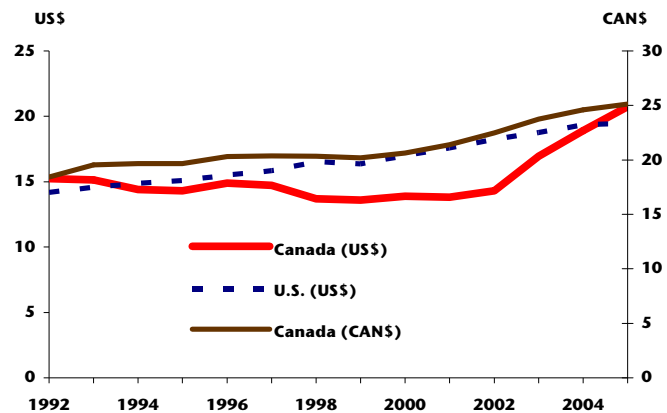
Source: Statistics Canada and AAFC calculations.

- **The cost of labour in Canadian FBT manufacturing industries, which has been lower in the past relative to that of the U.S., rose slightly above wages in the U.S. in 2005 when both are measured in U.S. dollars.**

The hourly compensation cost in FBT manufacturing in Canada increased from US\$13.89 per hour in 2000 to US\$20.74 in 2005. U.S. wages in 2005 were US\$19.50 per hour.

When measured in national currencies, U.S. and Canadian wages exhibited similar trends in growth between 1992 and 2005.

**Chart C3.11**  
Hourly Compensation Costs in Food, Beverage and Tobacco Manufacturing, 1992-2005



Source: Statistics Canada and U.S. Bureau of Labor Statistics

## Profit margins in food processing have improved in 2007

- **Profit margins in food and soft drink processing have been consistently lower than total manufacturing, but the gap narrowed in 2007.**

These profit margins reflect improved revenue in the face of rising costs. Some companies have restructured to focus on value-added operations while others have consolidated to cut costs and remain competitive.

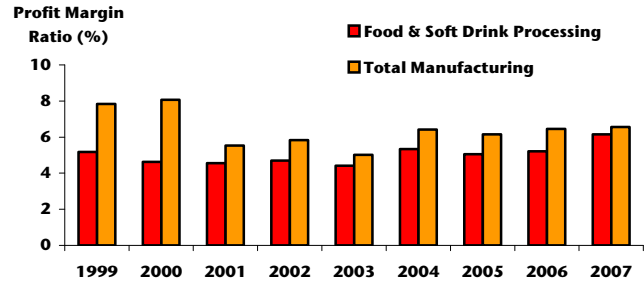
- **Corporate income tax rates for businesses primarily engaged in manufacturing and processing have declined in all provinces since the mid-1980s due to changes in government tax measures.**

For example, in Ontario and Quebec, the combined federal and provincial corporate tax rates were around 46% and 37%, respectively in the mid-1980s. The combined rates fell to 34% and 32%, respectively in 2007.

Lower rates improved returns for corporations.

- **Return on equity measures the rate of return of ownership and is fairly variable for the food and soft drink industry. However, it shows an increasing trend over the last three years.**

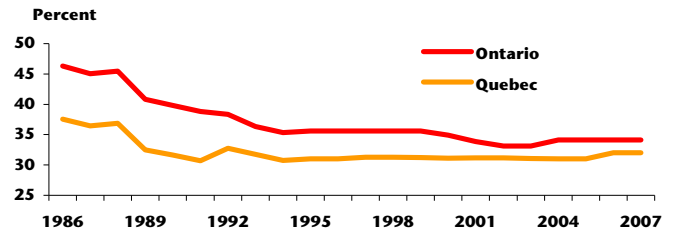
**Chart C3.12**  
Profit Margin Ratio in Food and Total Manufacturing, 1999-2007



Source: Statistics Canada.

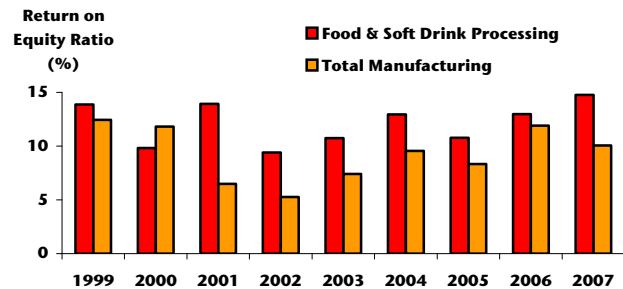
Note: See Glossary for definition of the profit margin ratio.

**Chart C3.13**  
Combined Federal/Provincial Corporate Income Tax Rates for Manufacturers and Processors, Ontario and Quebec: 1986-2007



Source: AAFC. "Corporate Income Tax Rate Database: Canada and the Provinces, 1960-2007" (revised August 2008).

**Chart C3.14**  
Return on Equity Ratio in Food and Total Manufacturing, 1999-2007

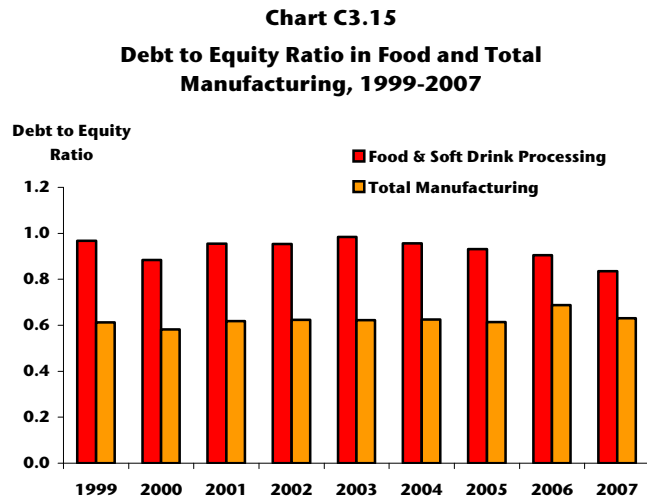


Source: Statistics Canada.

Note: See Glossary for definition of the return on equity ratio.

## Lower debt to equity ratios in food processing reflect reduced borrowing to finance capital investments

- The food and soft drink industry's debt to equity ratio has fallen recently but still remains higher than the average for total manufacturing.



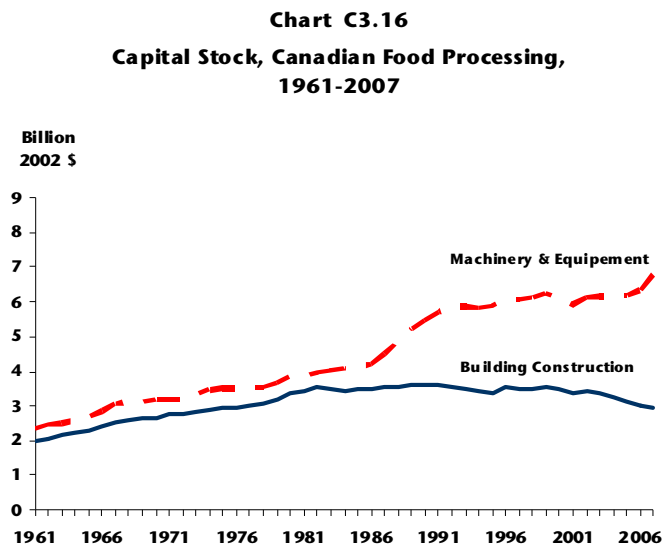
Source: Statistics Canada.

Note: See Glossary for definition of the debt to equity ratio.

- Growth in the total stock of productive capital in food processing has slowed in the past decade, increasing by only 0.3% annually between 1998 and 2007.

During this time period, the stock of machinery and equipment increased by 1.2% annually but the stock of buildings decreased by 1.7%.

This indicates a significant change in the composition of capital, reflecting increased investment in machinery and equipment inputs due to the appreciated exchange rate since 2003, which lowered the cost of imported goods.



Source: Statistics Canada.

Note: End-year net stock (Geometric).

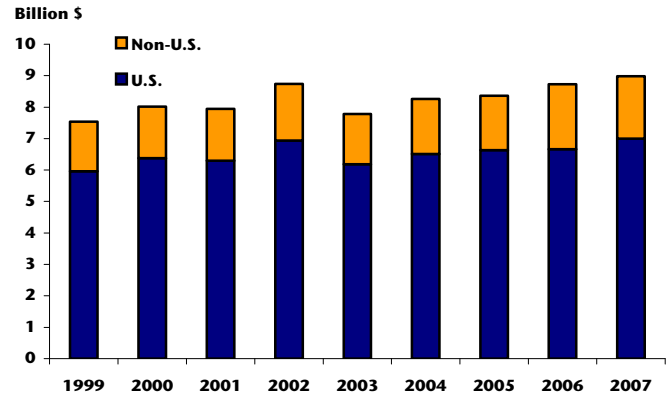
## The source of Foreign Direct Investment (FDI) differs between food and beverage processing

- **The Canadian food processing industry is very much integrated with the U.S. industry.**

Most of the FDI in the Canadian food processing industry originates from the U.S.

The U.S. accounted for 78% of all inward food processing FDI in Canada in 2007.

**Chart C3.17**  
Stock of FDI in Canadian Food Manufacturing by Country of Origin, 1999-2007

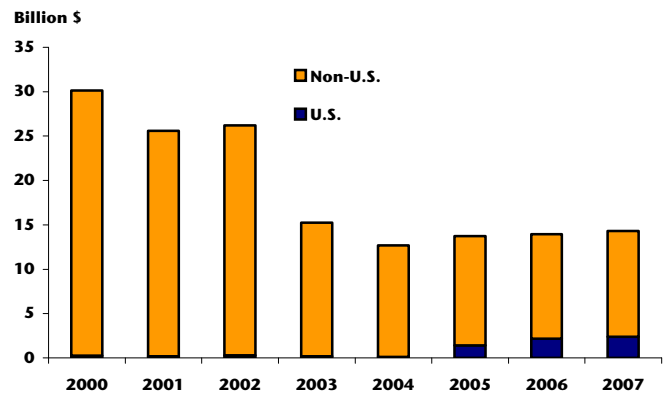


Source: Statistics Canada and AAFC calculations.

Note: NAICS classification system.

- **FDI in the Canadian beverage and tobacco processing industry, on the other hand, originated mostly from outside North America.**

**Chart C3.18**  
Stock of FDI in Canadian Beverage and Tobacco Manufacturing by Country of Origin, 2000-2007



Source: Statistics Canada and AAFC calculations.

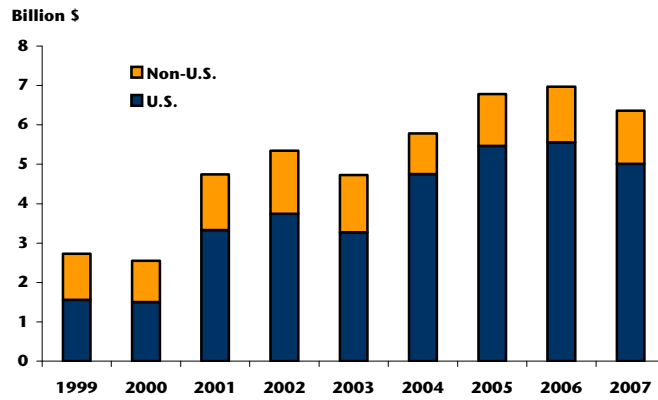
Note: NAICS classification system.

**Canadian food and beverage processing firms have also been investing abroad**

- **Canadian companies also invest in food processing industries in other countries.**

More than 79% of total outward food processing FDI by Canadian companies went to the U.S. in 2007.

**Chart C3.19**  
**Accumulated Outward Investment in Food Manufacturing by Destination Country, 1999-2007**



Source: Statistics Canada and AAFC calculations.  
 Note: NAICS classification system.







# SECTION C4

## Primary Agriculture

Agricultural producers have direct links to other stages in the supply chain and production is becoming increasingly integrated. Hence, developments in commodity markets, such as production and price trends, have impacts on the performance of primary agriculture and throughout the supply chain. At the disaggregated level, farms are diverse with different business strategies and management skills and also differ by typology, farm size and type. This diversity explains the differences in performance between farms.

## Agricultural producers have direct links to all stages in the supply chain

- **The Canadian food, beverage and tobacco (FBT) processing industry is the single most important market for agricultural products.** It utilizes almost half (45%) of the value of agricultural products available in Canada.

Agricultural producers have many alternative marketing choices. In 2004, 18% of farm production was exported directly (a portion of which is directed to FBT and subsequently exported as food products), 14% was consumed within primary agriculture (as feed, seeds, etc.), 12% went to food distribution (consisting mostly of fresh fruits and vegetables), and another 7% was directed to non-food use.

**Chart C4.1**  
**Disposition of the Value of Agricultural Production, 2004**

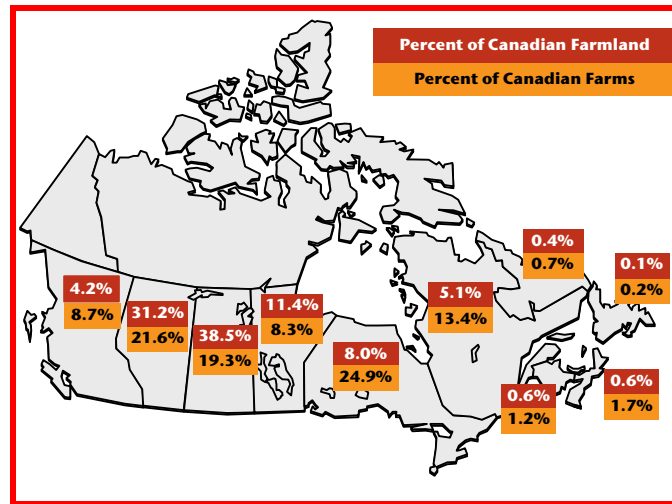


Source: Statistics Canada Input/Output Model and AAFC calculations.

## Production is very diverse across all provinces

- **The Prairie provinces account for roughly 81% of total farmland. British Columbia, Ontario and Quebec account for another 17%.** The remaining 2% of farmland is located in Atlantic Canada. However, most farms are located in Ontario, Alberta and Saskatchewan.

**Chart C4.2**  
Provincial Shares of Farmland and Farms, 2006



Source: Statistics Canada, 2006 Census of Agriculture.

- **Farm size varies across Canada depending, in large part, on commodity specialization and geographic characteristics of regions.**

The average farm size in Ontario, where farming is more intensive, is around 230 acres. The average farm size in Saskatchewan, where farming is more extensive, is nearly six times this size at 1,450 acres.

There are more farm operators than there are farms because of partnerships and other joint ownership arrangements.

**Chart C4.3**  
Number and Size of Farms, 2006

|               | Farmland<br>(Thousand<br>Acres) | Farms (#)      | Average<br>Farm Size<br>(Acres) | Farm<br>Operators<br>(#) | Farm<br>Employment<br>(#) |
|---------------|---------------------------------|----------------|---------------------------------|--------------------------|---------------------------|
| <b>Canada</b> | <b>167,010</b>                  | <b>229,373</b> | <b>728</b>                      | <b>327,055</b>           | <b>304,600</b>            |
| <b>N.L.</b>   | 89                              | 558            | 160                             | 715                      | 1,700                     |
| <b>P.E.I.</b> | 620                             | 1,700          | 365                             | 2,335                    | 3,700                     |
| <b>N.S.</b>   | 996                             | 3,795          | 262                             | 5,095                    | 4,300                     |
| <b>N.B.</b>   | 977                             | 2,776          | 352                             | 3,695                    | 5,800                     |
| <b>Que.</b>   | 8,557                           | 30,675         | 279                             | 45,470                   | 61,900                    |
| <b>Ont.</b>   | 13,310                          | 57,211         | 233                             | 82,410                   | 88,000                    |
| <b>Man.</b>   | 19,073                          | 19,054         | 1,001                           | 26,620                   | 25,500                    |
| <b>Sask.</b>  | 64,254                          | 44,329         | 1,449                           | 59,185                   | 41,800                    |
| <b>Alta.</b>  | 52,128                          | 49,431         | 1,055                           | 71,660                   | 41,200                    |
| <b>B.C.</b>   | 7,007                           | 19,844         | 353                             | 29,870                   | 30,500                    |

Source: Statistics Canada, 2006 Census of Agriculture, Labour Force Survey.

Note: Farm operators are those who are actually involved in the management decisions made for the agricultural operation.

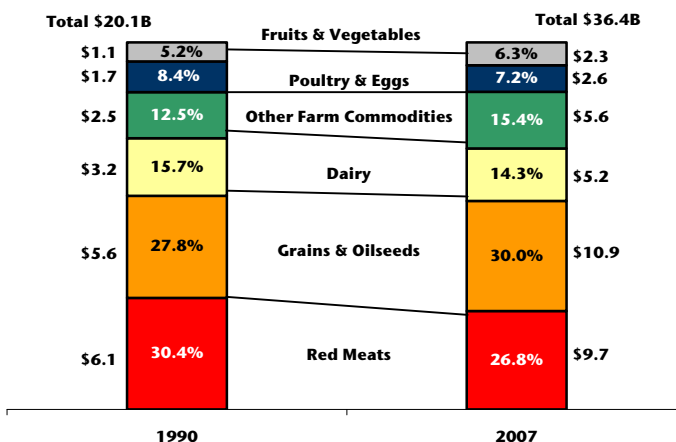
Employment is recorded by major work activity. Thus, if a farm operator relies on off-farm work for a significant portion of his/her income, he/she is not considered to be in farm employment.

# Canada produces a diverse set of commodities which has evolved and varies by province

- **The commodity mix is changing as producers are diversifying production.**

In 2007, farm market receipts totalled \$36.4 billion, up from \$20.1 billion in 1990. Since 1990, the contributions of fruits and vegetables, grains and oilseeds and other farm commodities have increased relative to a traditional mix of products such as dairy and red meats.

**Chart C4.4**  
Farm Market Receipts by Commodity, 1990 and 2007



Source: Statistics Canada.

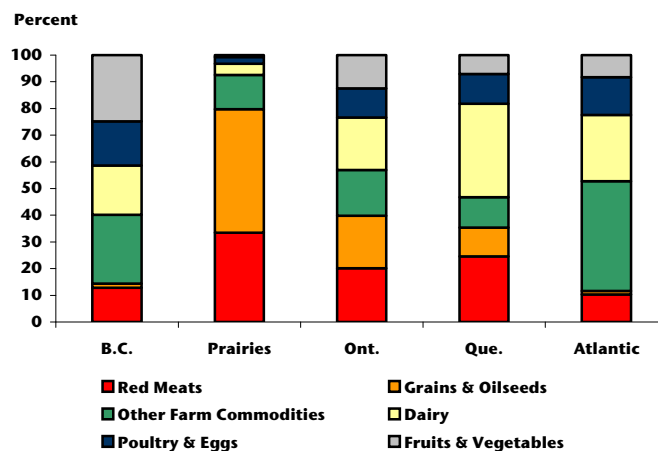
- **Product mix varies by province.**

In the Prairies, red meats and grains and oilseeds accounted for the largest share of farm market receipts, whereas in British Columbia, higher contribution came from fruits, vegetables and other farm products.

In Quebec, red meats and dairy accounted for the majority of farm market receipts.

In the Atlantic provinces, other farm commodities such as special crops contributed to over 40% of farm market receipts in 2007.

**Chart C4.5**  
Regional Farm Market Receipts by Commodity Share, 2007



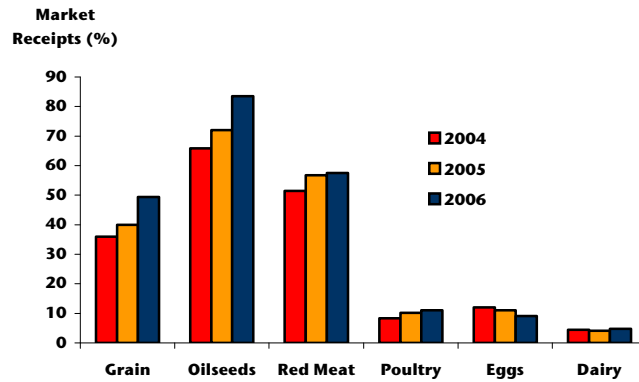
Source: Statistics Canada.

**The Canadian agriculture and agri-food sector is very export dependent, both on a commodity and national level**

- **The grain and oilseed and red meat industries have increased their export market share over time.**

In 2006, grain and oilseed, and red meat producers earned 49%, 84% and 58%, respectively of their farm cash receipts from export markets. This was an improvement from that of the previous year.

**Chart C4.6**  
Share of Production from Export Sales, 2004-2006



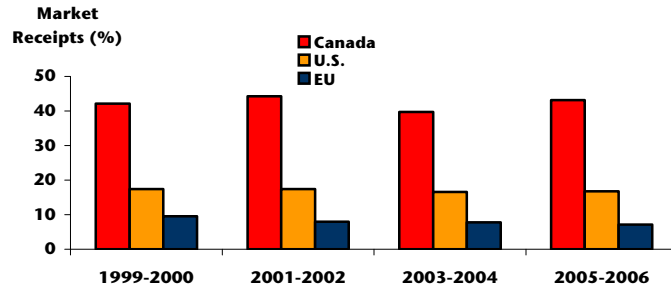
Source: Statistics Canada and AAFC calculations.

Note: Export dependency is calculated in terms of volume to avoid export and farmgate price differentials. Grain and oilseed export dependency is calculated on a crop year basis and dairy on a dairy year basis.

- **Overall, Canada's agricultural producers are significantly more export oriented than those in the U.S. and EU.**

About 45% of Canada's agricultural production was exported in 2006 compared to 18% and 7% for the U.S. and EU respectively.

**Chart C4.7**  
Share of Farm Market Receipts from Export Sales for Canada, the U.S. and the EU, 1999-2006



Source: Statistics Canada, OECD and AAFC calculations.

Note: Export dependency is calculated as a value of production weighted average of the export dependencies of the following commodities - wheat, coarse grains, oilseeds, beef, pork, dairy and poultry. These commodities cover about 50% of the EU's total farm production, 60% of the U.S.'s total of the farm production and 75% of Canada's total farm production.

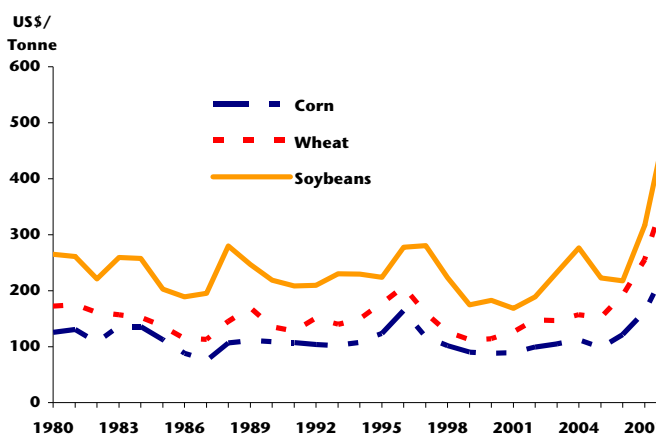
## In 2007 and 2008, prices in the grain and oilseed sector increased rapidly, while livestock prices remained largely unchanged

- **Corn, wheat and soybean prices rose 34%, 33% and 46%, respectively, between 2006 and 2007. The trend of rising prices continued into 2008.**

Higher cereal and oilseed prices have led to increased farm revenues for crop producers.

However, rising corn prices have had a negative impact on livestock producers who use grains as feed.

**Chart C4.8**  
U.S. Corn, Wheat and Soybean Prices,  
1980-2008



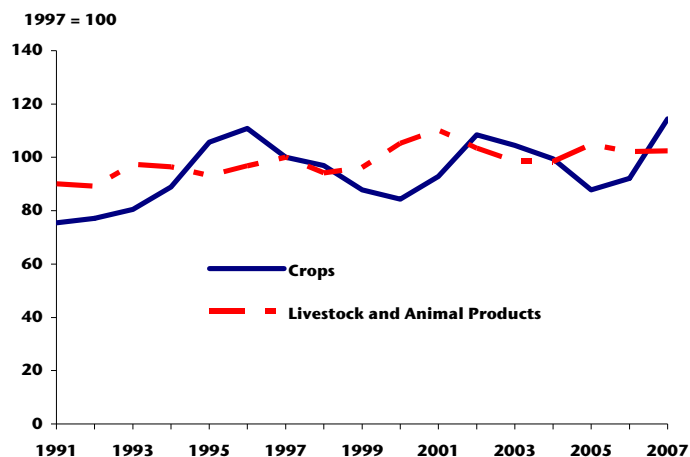
Source: IMF Primary Commodity Price.

Note: Data reflects prices as of June 2008.

- **Overall, crop prices rose 24% between 2006 and 2007. Livestock prices have changed very little.**

Livestock owners have responded to higher feed prices by liquidating animal stocks, which has kept livestock and animal prices stable.

**Chart C4.9**  
Farm Product Price Index:  
Crop Prices and Livestock Prices,  
1991-2007



Source: Statistics Canada.

**Farm market receipts in 2007 were boosted by rising prices in the grain and oilseed sector**

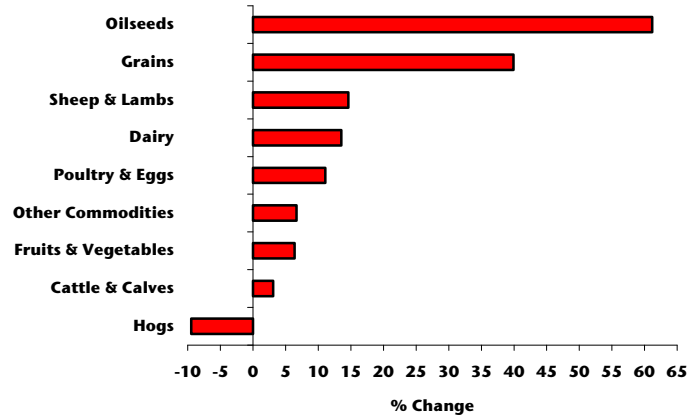
- **Farm market receipts in 2007, at \$36 billion, were 13% higher than the previous five-year average.**

Grain and oilseed receipts rose significantly in 2007, partly due to stronger prices which resulted from the stronger demand for grain and oilseed crops.

The cattle and calf industry has gradually recovered after BSE. Market receipts in 2007 increased by 3% over the previous five-year average.

Hog market receipts declined in 2007 for the third year in a row, 3% less than the five-year average, due to low hog prices.

**Chart C4.10**  
**Farm Market Receipts by Commodity, 2007**  
**Relative to Five-Year Average**

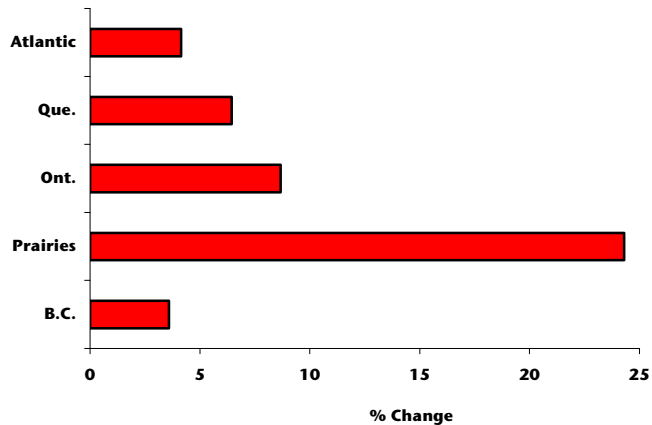


Source: Statistics Canada.

- **On a regional basis, the Prairies have experienced a rapid increase in farm market receipts due to high prices for grain and oilseed crops.**

In 2007, most other provinces experienced moderate growth in farm market receipts relative to the five-year average.

**Chart C4.11**  
**Regional Farm Market Receipts, 2007 Relative to**  
**Five-Year Average**



Source: Statistics Canada.

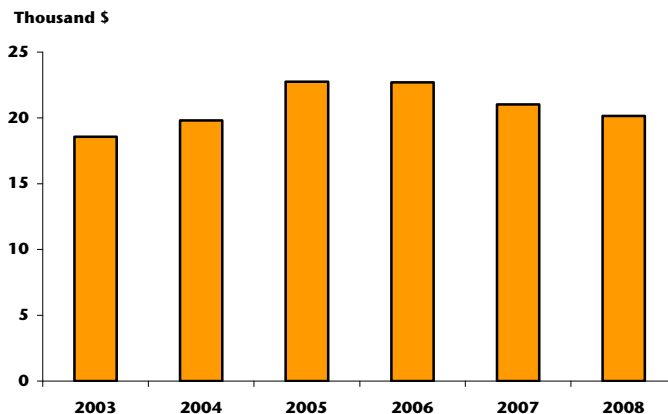


## Program payments have declined overall in recent years as market income has improved

- **Program payments per farm fell in 2007 and are expected to fall further in 2008, as incomes are partially recovering after peaking in the 2005 to 2006 period.**

Program payments per farm are expected to continue to drop in 2008 to \$20,144 from their peak in 2005 of \$22,730.

**Chart C4.12**  
Program Payments per Farm, 2003-2008



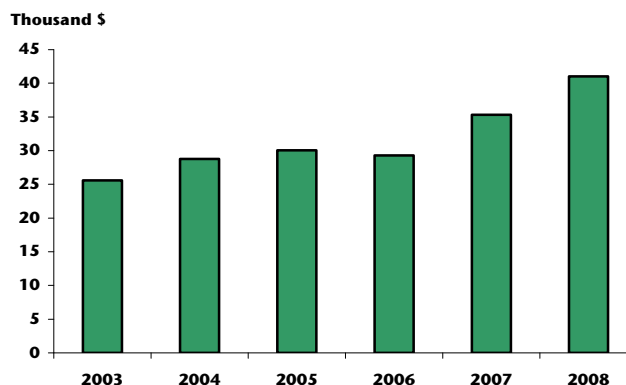
Source: Statistics Canada and AAFC calculations.

Note: 2008 figures are forecasts.

- **Net cash income per farm is expected to rebound in 2008 due to higher crop prices.**

In 2008, net cash income per farm will average \$41,021, up from \$35,314 the year before. However, income varies for individual producers, depending on type of commodity produced, degree of specialization and diversification, size of operation and financial situation.

**Chart C4.13**  
Net Cash Income per Farm, 2003-2008



Source: Statistics Canada and AAFC calculations.

Note: 2008 figures are forecasts.

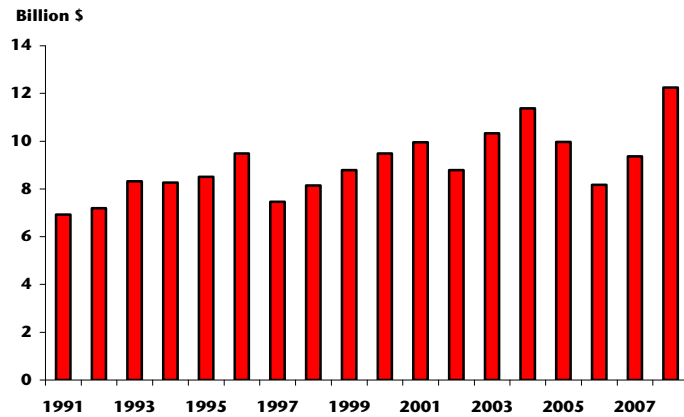
**The result was an increase in net value-added**

- **Net value-added measures the value of economic production in the Canadian agriculture sector.**

Agriculture’s net value-added is expected to rise to \$12.2 billion in 2008, up from \$9.4 billion in 2007.

In 2008, value-added in agriculture will increase due to the rapid growth in the value of agricultural production, as improved prices in the crop sector will more than offset high costs of production and lower receipts for red meat producers.

**Chart C4.14**  
Value-Added in Agriculture, 1991-2008



Source: Statistics Canada and AAFC calculations.

Note: 2008 figures are forecasts.

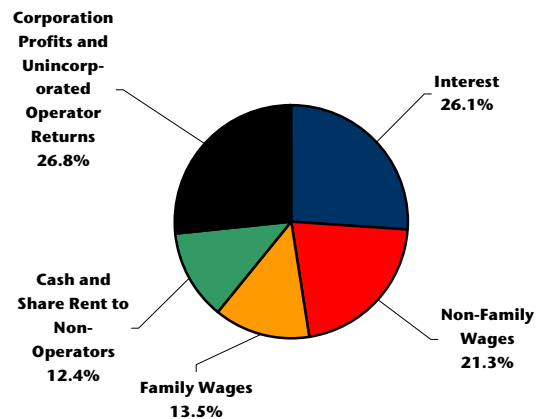
- **Net value-added measures the return to the various factors of production, including rent to non-operator landlords, interest to lenders and wages to non-family members.**

Interest and wages are expected to account for 61% of net value-added in 2008.

Corporation profits and unincorporated operator returns will account for about 27% of net value-added in 2008.

A sizeable share (12%) of value-added is attributed to non-operator landowners.

**Chart C4.15**  
Distribution of Net Value-Added, 2008



Source: Statistics Canada and AAFC calculations.

Note: 2008 figures are forecasts.

Net value-added is defined as the value of economic production from agricultural establishments and is expressed as gross value-added minus depreciation allowances. Gross value-added is calculated as income from all sources (sales, program payments, rent, and income-in-kind) minus expenses on inputs and business taxes.

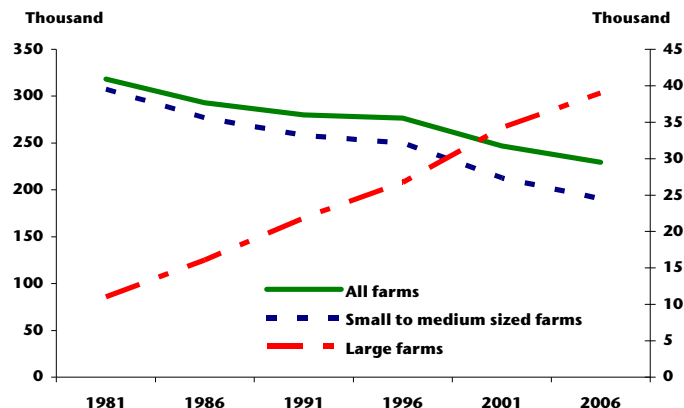
## Large farms are increasing in number and importance

- While the total number of farms in Canada is decreasing, technologies have changed the optimal scale of production for many agricultural commodities.

In the last 25 years, the total number of farms in Canada declined 28%. Large farms, with gross revenues of \$250,000 and over, witnessed a threefold increase in farm numbers, increasing from 11,005 farms in 1981 to 38,980 in 2006.

At the same time, the number of small to medium-sized farms with less than \$250,000 in gross revenues decreased by 38%.

**Chart C4.16**  
Number of Farms by Revenue Class, 1981 - 2006



Source: Statistics Canada, Census of Agriculture, various years.

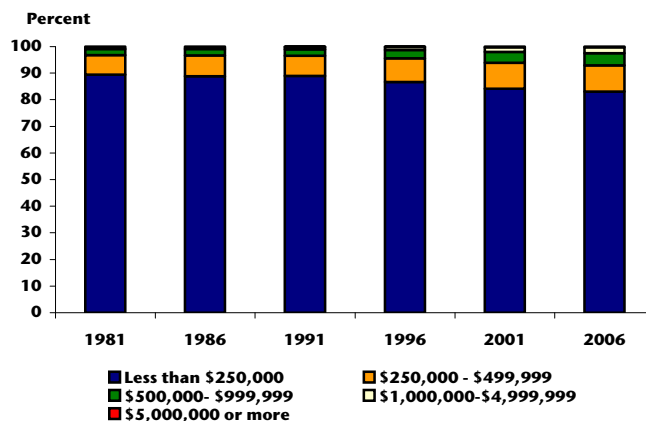
- The number and share of million-dollar farms in Canada is on the rise.

Million-dollar farms account for 2.5% of farms in Canada.

Between 1981 and 2006, farms with gross revenues of between \$1 million and \$4.9 million increased fourfold (430%) to 5,339 farms in 2006.

Over the same period, five-million-dollar farms increased sevenfold (660%) to 563 farms in 2006.

**Chart C4.17**  
Percent of Farms by Revenue Class, 1981-2006



Source: Statistics Canada, Census of Agriculture, various years.  
Note: Revenue categories based on reference year and are in constant 2005\$.

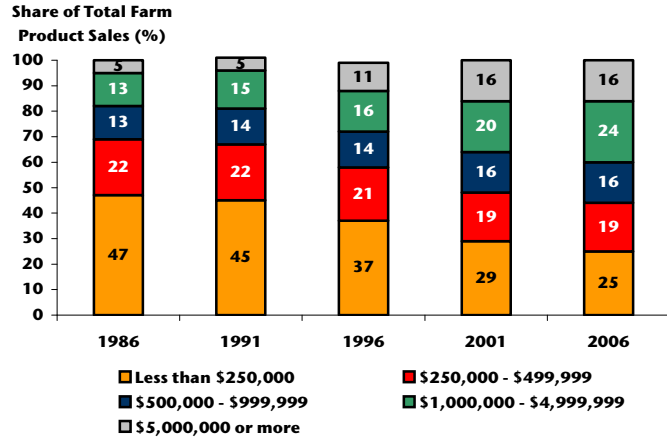
**Farms with revenues over one million dollars are producing an increasing share of total farm sales**

- **Million-dollar farms now account for 40% of gross revenue. Million-dollar farms doubled their share of gross revenue from 18% in 1986 to 40% in 2006.**

Most million-dollar farms have revenues between \$1 million and \$1.5 million and this class shows steady growth.

Five-million-dollar and over farms have expanded their share the fastest.

**Chart C4.18**  
**Distribution of Gross Farm Receipts by Revenue Class (2005 Constant \$), 1986-2006**



Source: Statistics Canada, 2006 Census of Agriculture.

## Aggregate net cash income masks the difference among individual farms, which varies by farm size, type and province

- **Average net cash income is expected to be \$41,021 in 2008.**

Average net cash income varies from \$1,651 for farms with gross revenues of \$10,000 to \$99,999, to \$324,257 for million-dollar and over operations.

- **Saskatchewan and Manitoba are forecast to report the highest average net cash income.**

Average net cash income will range from \$14,267 in Newfoundland to \$44,480 in Saskatchewan.

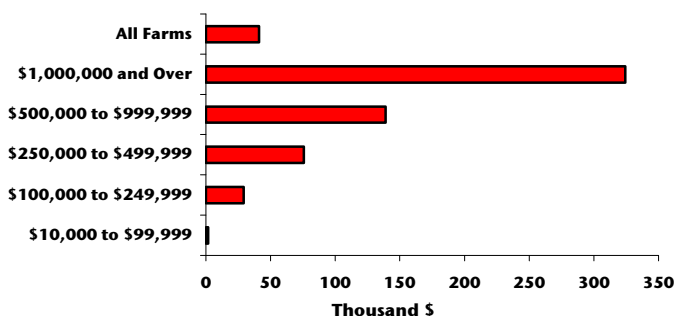
- **On average, dairy and horticulture farms are forecast to have the highest average net cash income among farms in 2008.**

Hog and cattle farms are expected to report the lowest average net cash income in 2008.

Record high grain and oilseed prices in 2008 will lead to stronger returns for grain and oilseed farms, but this will also mean higher fuel costs for cattle and hog farms.

Chart C4.19

### Average Net Cash Income by Revenue Class, 2008

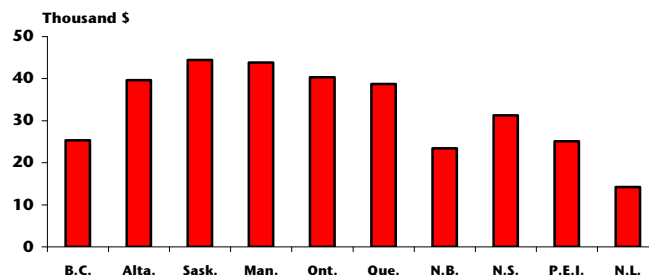


Source: Statistics Canada and AAFC calculations.

Note: 2008 figures are forecasts.

Chart C4.20

### Average Net Cash Income by Province, 2008

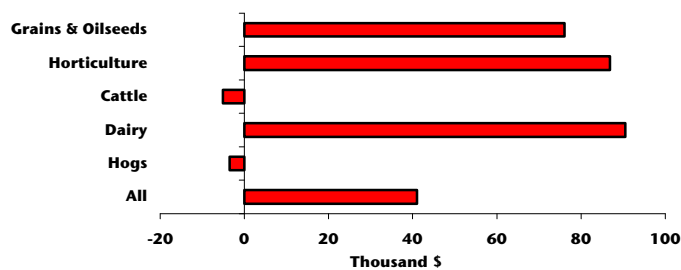


Source: Statistics Canada and AAFC calculations.

Note: 2008 figures are forecasts.

Chart C4.21

### Average Net Cash Income by Farm Type, 2008



Source: Statistics Canada and AAFC calculations.

Note: 2008 figures are forecasts.

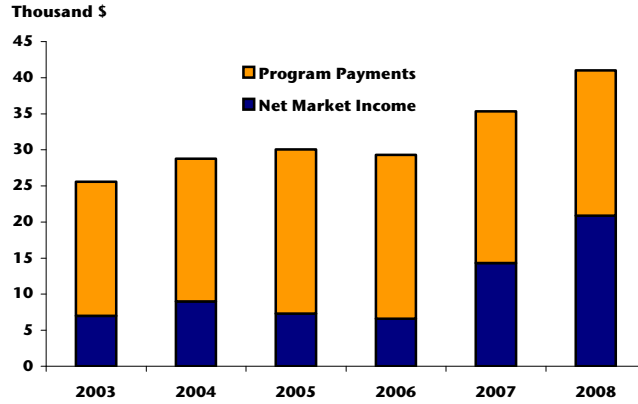
**Farm net market income has increased with program payments making up for shortfalls in market revenue**

- **Net market income per farm is expected to increase from \$14,300 to \$20,877 for farms between 2007 and 2008.**

Program payments per farm will decrease from \$21,013 for farms between 2007 and 2008.

Market income is up because of higher prices for grains and oilseeds.

**Chart C4.22**  
Average Net Market Income and Program Payments, 2003-2008



Source: Statistics Canada and AAFC calculations.  
Note: 2008 figures are forecasts.

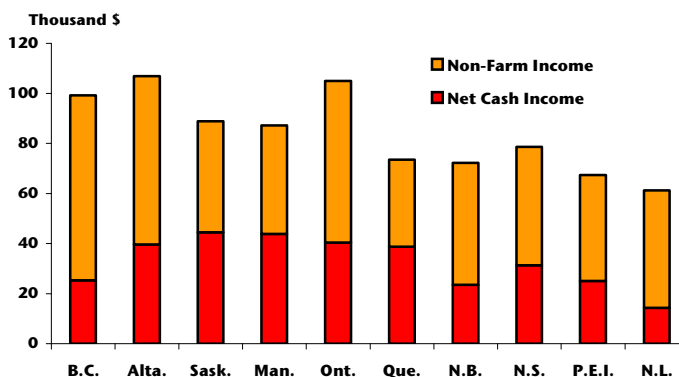
## Average total farm family income also varies by province and farm type

- **Average total farm family income varies by province.**

Farm families in Alberta, British Columbia and Ontario have the highest average total and non-farm incomes.

Farm families in Newfoundland have the lowest average total farm family incomes. Quebec farm families have the lowest non-farm incomes.

**Chart C4.23**  
Average Total Farm Family Income by Province, 2008



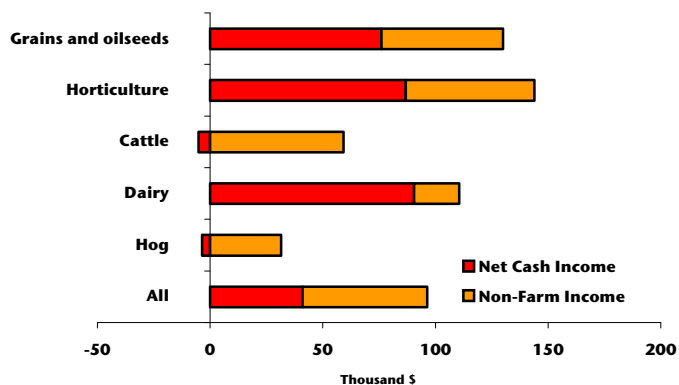
Source: Statistics Canada and AAFC calculations.

Note: 2008 figures are forecasts.

- **Farm families on horticulture and dairy farms have the highest average total family income among farms.**

Farm families on cattle and horticulture farms have the highest non-farm incomes. Those on dairy and hog farms have the lowest non-farm incomes.

**Chart C4.24**  
Average Total Farm Family Income by Farm Type, 2008



Source: Statistics Canada and AAFC calculations.

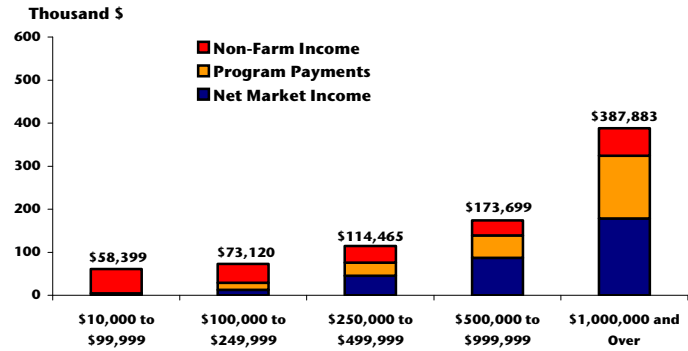
Note: 2008 figures are forecasts.

## Non-farm income accounts for a significant amount of farm family income

- Families on smaller farms are more dependent on non-farm income.

For smaller farms, non-farm income along with program payments are enough to offset negative and low net market income.

**Chart C4.25**  
Average Income of Farm Families by Source of Income, 2008



Source: Statistics Canada and AAFC calculations.

Note: 2008 figures are forecasts.

Net market income does not include CCA.

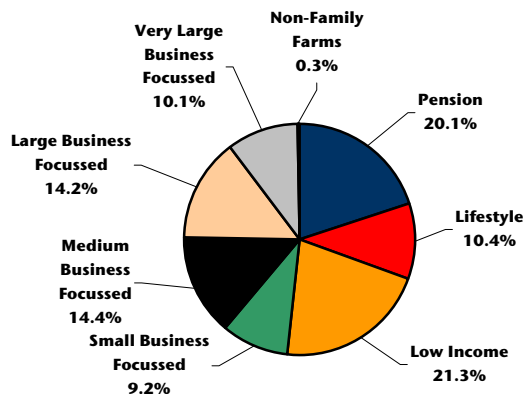


## Different people farm for different reasons, which is captured by farm typology

- **Farm and farm families operate farms for different reasons. Farms can be classified by age of the operator, income, and focus.**

About 38% of farms are business oriented and can be categorized by their scale of operation. They range from small to very large business focussed farms. Another 30% of farms are either retirement or lifestyle farms, whereas the 21% of remaining farms are low income farms.

**Chart C4.26**  
Distribution of Farms with \$10,000 or more in Gross Farm Receipts by Typology Group, 2006



Source: Statistics Canada and AAFC, 2007 Farm Financial Survey.

**Chart C4.27**  
Definition of Farm Typology

| Typology  | Definitions  |
|---|--|
| <b>Small Family Farms (gross revenues of \$10,000 - \$249,999)</b>    |  |
| <b>Pension</b>  | Farms whose operators are 65 and over, and those 60 to 64 receiving pension income. Multi-generational farms are excluded.                             |
| <b>Lifestyle</b>  | Farm families operating with gross farm revenues of \$10,000 to \$49,999, and whose farm family earn \$50,000 or more from non-farm sources of income. |
| <b>Low Income</b>   | Farm families where total household income is below Statistics Canada's Low Income Measure (LIM).  |
| <b>Business Focussed</b>  | Farms with \$10,000 to \$249,999 in gross revenues that do not fall in any of the three previous categories.   |
| <b>Small Business Focussed</b>  | Farms with gross revenues of \$10,000 to \$99,999.   |
| <b>Medium Business Focussed</b>                                       | Farms with gross revenues of \$100,000 to \$249,999.   |
| <b>Large-scale Family Farms (gross revenues of \$250,000 or more)</b> |  |
| <b>Large Business Focussed</b>  | Farms with gross revenues of \$250,000 to \$499,999.   |
| <b>Very Large Business Focussed</b>                                   | Farms with gross revenues of \$500,000 or more.  |
| <b>Non-family Farms</b>   | Farms organized as non-family corporations, co-operatives or communal operations. Also includes farms held in estates or trusts.                       |

Note: Typology definitions have changed from previous years and are not directly comparable.  
Hobby farms, those with less than \$10,000 in gross revenues, are not included in this breakdown.

## The financial performance of farms will vary depending on a farmer's lifestyle and business strategies

- **On average, only low income and lifestyle farms reported negative net operating income in 2006.** However, lifestyle and small business focussed farms reported the highest average off-farm income in the same year.

**Chart C4.28**  
**Farm Typology Data, 2006**

| Typology  | Number of Farms | Average Gross Farm Revenue* | Household Share of the Farm** |                            | Wages and Salaries Earned by the Family |                       |                                 | Family Income<br>(F) (A+B+C+D+E) |
|---|-----------------|-----------------------------|-------------------------------|----------------------------|---|-----------------------|---------------------------------|----------------------------------|
|   |                 |                             | Net Market Income<br>(A)      | Program Payments***<br>(B) | Farm Wages<br>(C)                       | Non-Farm Wages<br>(D) | Other Income Sources****<br>(E) |                                  |
|   |                 |                             |                               |                            |   |                       |                                 |                                  |
| <b>Small and Medium Family Farms</b><br>gross revenues \$10,000 - \$249,999 |                 |                             |                               |                            |   |                       |                                 |                                  |
| Pension   | 34,651          | 59,353                      | -2,906                        | 8,520                      | 1,902                                   | 9,026                 | 28,753                          | 45,295                           |
| Lifestyle   | 13,972          | 26,503                      | -10,127                       | 2,785                      | 1,106                                   | 67,289                | 33,891                          | 94,943                           |
| Low Income  | 27,630          | 82,507                      | -18,175                       | 8,881                      | 2,815                                   | 10,014                | 8,125                           | 11,660                           |
| Small Business Focussed   | 12,242          | 62,352                      | 1,846                         | 9,061                      | 1,502                                   | 46,327                | 41,658                          | 100,395                          |
| Medium Business Focussed  | 19,950          | 167,480                     | 20,079                        | 17,811                     | 8,349                                   | 27,884                | 21,712                          | 95,836                           |
| <b>Total</b>  | <b>108,445</b>  | <b>81,250</b>               | <b>-2,962</b>                 | <b>9,644</b>               | <b>3,173</b>                            | <b>24,464</b>         | <b>24,321</b>                   | <b>58,640</b>                    |
| <b>Large Family Farms</b><br>gross revenues \$250,000 or more               |                 |                             |                               |                            |   |                       |                                 |                                  |
| Large Business Focussed   | 20,402          | 351,388                     | 24,888                        | 33,532                     | 15,516                                  | 11,827                | 18,188                          | 103,950                          |
| Very Large Business Focussed  | 14,523          | 1,203,514                   | 81,193                        | 65,403                     | 47,508                                  | 11,170                | 23,718                          | 228,992                          |
| <b>Total</b>  | <b>34,925</b>   | <b>705,741</b>              | <b>48,302</b>                 | <b>46,786</b>              | <b>28,820</b>                           | <b>11,554</b>         | <b>20,487</b>                   | <b>155,948</b>                   |
| <b>Non-Family Farms</b>   | <b>446</b>      | <b>2,936,803</b>            | <b>na</b>                     | <b>na</b>                  | <b>na</b>                               | <b>na</b>             | <b>na</b>                       | <b>na</b>                        |

Source: Statistics Canada and AAFC, 2007 Farm Financial Survey.

Note: \* Gross farm revenue includes government payments.

\*\* Household share is based on an individual's or family's percent ownership of the farm.

\*\*\* Program payments excludes non-farm government transfer payments.

\*\*\*\* Other income includes non-farm self-employment income, investment income, pension income and other income.

# Farm financial performance depends on the management skills of farmers, and even varies within a revenue class

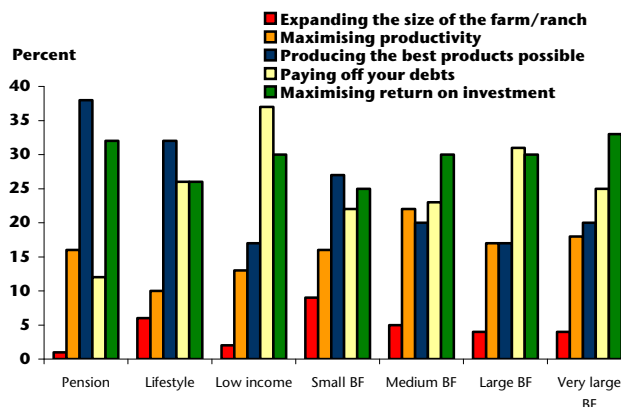
- **Business goals vary by typology.**

According to the 2007 National Renewal Survey, maximizing return on investment and paying off debts were two of the most important business goals of the majority of farms in the business focussed group.

For the pension and lifestyle groups, producing the best products possible was the most important goal.

For the low income group, paying off their debts was considered the most important goal followed by maximizing their return on investment.

**Chart C4.29**  
Most Important Business Goal by Farm Typology, 2007



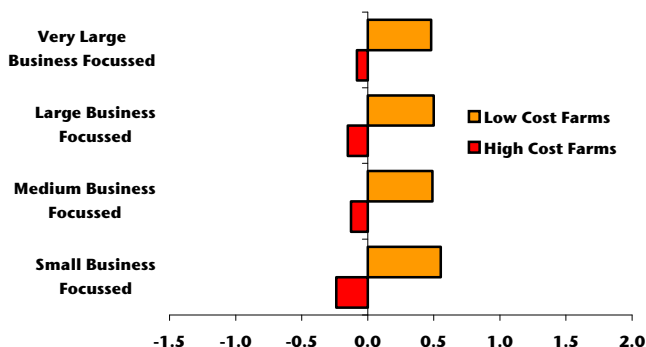
Source: AAFC, 2007 Renewal Survey

Note: Includes farms with \$100,000 or more in gross revenues.  
BF: Business focussed.

- **Low cost business focussed farms, generate comparable gross margin ratios regardless of size.**

Conversely, high cost business focussed farms, which are small, generate the highest negative margin among all farm types.

**Chart C4.30**  
Gross Margin Ratios\* Reported by High Cost and Low Cost Farms\*\* by Typology, 2006



Source: Statistics Canada and AAFC, 2007 Farm Financial Survey.

Note: Includes farms with \$10,000 or more in gross revenues.

\*Gross margin ratios are calculated as the ratio of net operating income to gross farm revenues.

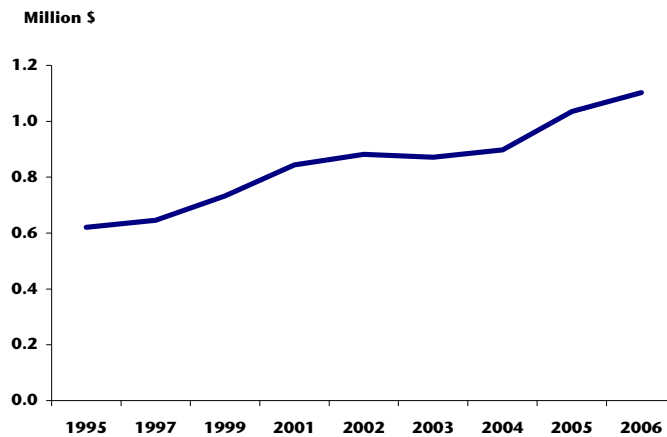
\*\*Low cost and high cost farms are the top and bottom 20% of farms respectively, based on operating margin.

**The financial situation of farms takes into account both income and net worth measures, which have grown over time and vary by province**

- **The net financial position of farms may be measured by average net worth.**

In Canada, average farm net worth continued to increase over the last few years after a slight decline occurred in 2003. In 2006, the average net worth was \$1,102,537, up 6.4% from 2005 and 78% from 1995.

**Chart C4.31**  
Average Farm Net Worth, 1995-2006

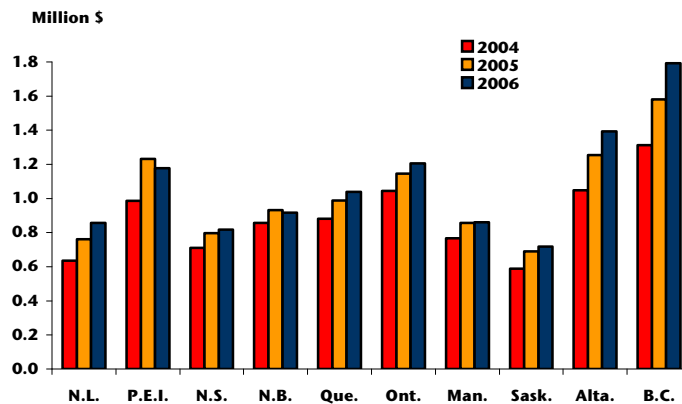


Source: Statistics Canada and AAFC, Farm Financial Survey, various years.  
Note: Includes farms with \$10,000 or more in gross revenues.

- **All provinces showed an increase in average net worth in 2006 compared to 2005 and 2004, with the exception of Prince Edward Island and New Brunswick where average net worth declined compared to 2005.**

Average net worth increased faster in British Columbia and Alberta than in other provinces, partly due to the increasing land values in Western Canada.

**Chart C4.32**  
Average Farm Net Worth by Province, 2004-2006



Source: Statistics Canada and AAFC, Farm Financial Survey, various years.  
Note: Includes farms with \$10,000 or more in gross revenues.

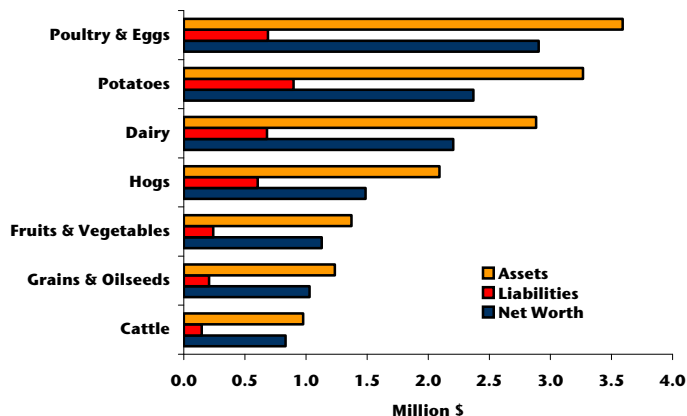
## Farm net worth also varies by farm type

- **Poultry and egg farms, potato, dairy and hog farms have the highest net worth, ranging from \$1.5 to \$2.9 million.**

The Canadian average for all farms was \$1.1 million in 2006. Cattle farms had the lowest assets, liabilities and net worth, on average.

On average, potato farms carry the largest debts (\$898,700 per farm) followed by poultry and eggs, and dairy farms with debts of \$687,200 and \$679,600, respectively.

**Chart C4.33**  
Average Assets, Liabilities and Net Worth by Farm Type, 2006



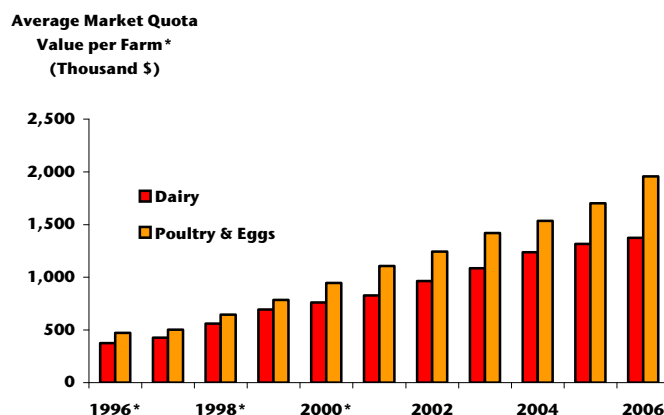
Source: Statistics Canada and AAFC, 2007 Farm Financial Survey.  
Note: Includes farms with \$10,000 or more in gross revenues.

- **Quota values in the supply-managed industries have grown significantly in recent years.**

In 2006, the average dairy farm had around \$1.4 million worth of quota and the average poultry farm around \$1.9 million, accounting for 47% and 46% of total farm assets, respectively.

The trend is caused by the increase in the value of quota per animal and the increase in the number of animals per farm.

**Chart C4.34**  
Average Quota Holdings of Supply-Managed Farms, 1995-2006



Source: Statistics Canada and AAFC, Farm Financial Survey, various years.  
Note: \*Includes farms with \$10,000 or more in gross revenues.

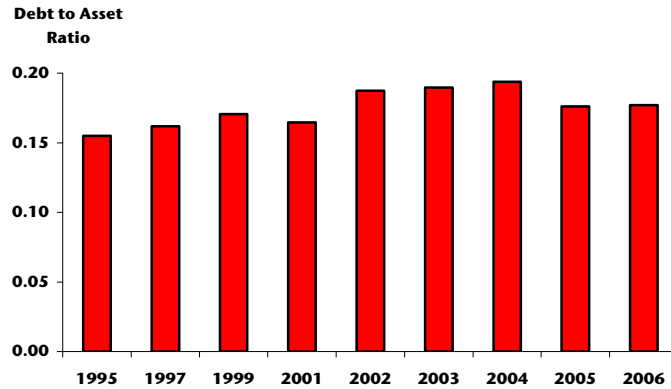
**The financial conditions of farms are reflected by both cash flow and debt to asset ratios**

- **The debt to asset ratio measures the farm's financial risk by determining how much of the farm's assets have been financed by debt.**

Overall, the debt to asset ratio for all farms has declined in 2005 and 2006.

The debt to asset ratio fell from 17.7% in 2004 to 15.5% in 2005 and 2006, reflecting an improvement in financial conditions.

**Chart C4.35**  
Debt to Asset Ratios\* for All Farms, Canada, 1995-2006



Source: Statistics Canada and AAFC, Farm Financial Survey, various years.

Note: Includes farms with \$10,000 or more in gross revenues.

\*Average per farm.

- **Financial stress is determined by cash flow and equity levels.**

The vast majority of farms were in a good financial position at the end of 2006.

Only 7.6% were under significant financial stress, while 17.1% of farms were under moderate financial stress.

**Chart C4.36**  
Financial Stress for All Farms, Canada, 2006

| Cash Flow Categories  | Equity in Percentage |            |                  | All Net Worth |
|-----------------------|----------------------|------------|------------------|---------------|
|                       | Less than 50%        | 50% to 75% | Greater than 75% |               |
| Less than \$20,000    | 2.1%                 | 4.7%       | 14.8%            | 21.6%         |
| \$20,000 to \$35,000  | 0.8%                 | 2.3%       | 7.8%             | 10.9%         |
| Greater than \$35,000 | 5.2%                 | 12.4%      | 49.9%            | 67.5%         |
| <b>All Cash Flow</b>  | 8.1%                 | 19.4%      | 72.5%            | 100.0%        |

Legend:  Significant risk.  
 Moderate risk.

Source: Statistics Canada and AAFC, 2007 Farm Financial Survey.

Note: Includes farms with \$10,000 or more in gross revenues excluding co-ops and communal operations.

## The financial stress of farms also varies by farm type

- **With improving grain prices, more than three-quarters of grain and oilseed farms were in good financial shape at the end of 2006.**

The vast majority of grain and oilseed farms were in a good financial position at the end of 2006, with 76.2% not under financial stress.

Only 7.6% were under significant financial stress while 16.2% were under moderate financial stress.

**Chart C4.37**  
Financial Stress Levels of Grain and Oilseed Farms in Canada, 2006

| Cash Flow Categories  | Equity in Percentage |                  |                   | All Equity        |
|-----------------------|----------------------|------------------|-------------------|-------------------|
|                       | Less than 50%        | 50% to 75%       | Greater than 75%  |                   |
| Less than \$20,000    | 2.4%<br>(1,232)      | 4.5%<br>(2,263)  | 14.7%<br>(7,386)  | 21.6%<br>(10,881) |
| \$20,000 to \$35,000  | 0.7%<br>(345)        | 1.5%<br>(746)    | 6.7%<br>(3,373)   | 8.9%<br>(4,464)   |
| Greater than \$35,000 | 4.2%<br>(2,117)      | 13.2%<br>(6,642) | 52.2%<br>(26,296) | 69.6%<br>(35,055) |
| <b>All Cash Flow</b>  | 7.3%<br>(3,694)      | 19.2%<br>(9,652) | 73.5%<br>(37,055) | 100%<br>(50,401)  |

Legend: ■ Significant risk.  
■ Moderate risk.

Source: Statistics Canada and AAFC, 2007 Farm Financial Survey.

- **In 2006, 28% of hog farms were under moderate and significant financial stress.**

Among hog farms, 16.3% were under significant financial stress, while 11.7% were under moderate financial stress. A relatively high percentage of farms (28.2%) had equity levels of less than 50%.

**Chart C4.38**  
Financial Stress Levels of Hog Farms in Canada, 2006

| Cash Flow Categories  | Equity in Percentage |                 |                  | All Equity      |
|-----------------------|----------------------|-----------------|------------------|-----------------|
|                       | Less than 50%        | 50% to 75%      | Greater than 75% |                 |
| Less than \$20,000    | 7%<br>(302)          | 5.5%<br>(238)   | 10.7%<br>(464)   | 23.2%<br>(1004) |
| \$20,000 to \$35,000  | 3.8%<br>(166)        | 1%<br>(45)      | 5.5%<br>(240)    | 10.4%<br>(451)  |
| Greater than \$35,000 | 17.4%<br>(752)       | 18%<br>(779)    | 31%<br>(1341)    | 66.4%<br>(2872) |
| <b>All Cash Flow</b>  | 28.2%<br>(1220)      | 24.5%<br>(1062) | 47.3%<br>(2045)  | 100%<br>(4327)  |

Legend: ■ Significant risk.  
■ Moderate risk.

Source: Statistics Canada and AAFC, 2007 Farm Financial Survey.

## Rates of return in farming also vary by farm type

- **Rates of return for greenhouses and nurseries and fruit and vegetable farms were higher than for cattle and grain and oilseed farms.**

Greenhouses had the highest annual return on assets at 7.4%. These farms do not generally have a large landbase and their buildings depreciate over time, thus, no capital gains occur.

Cattle farms had the lowest return on assets at 3.1%, compared to other farm types partly due to BSE.

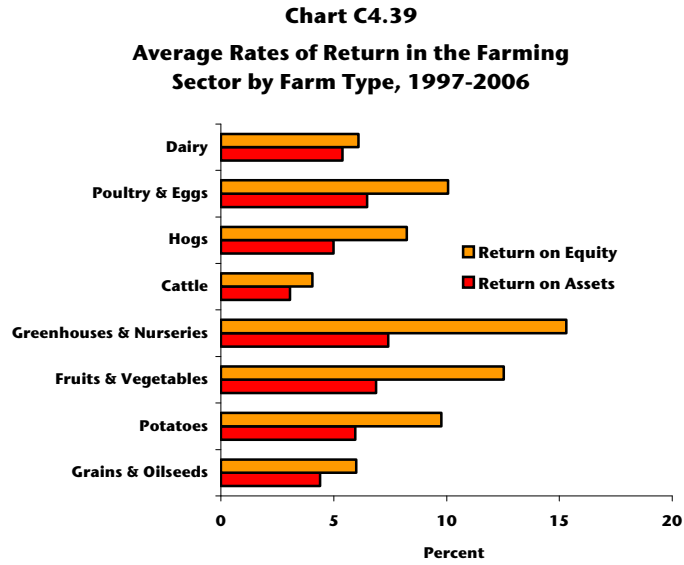
It is expected that most sectors will have higher rates of return once capital gains are factored into their total returns.

- **In Canada, the grain and oilseed sector had significant fluctuations on returns to both equity and assets between 1997 and 2006.**

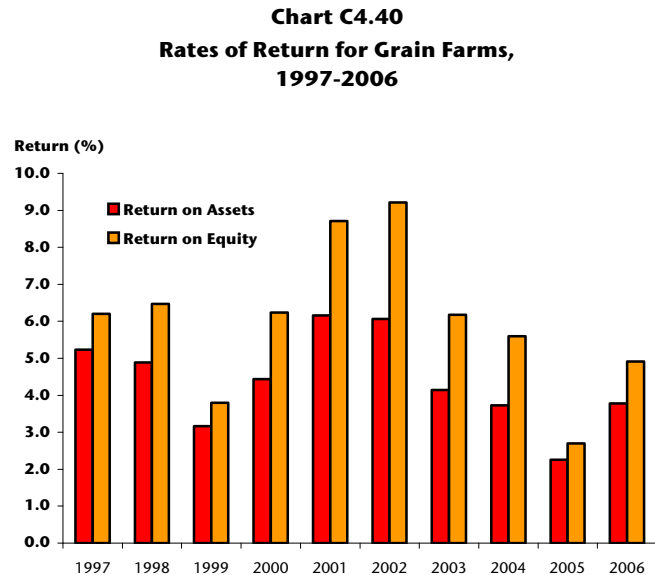
The rates of return for grain and oilseed farms increased in 2006 after recent sharp decreases.

The return on equity averaged 6.6% over the 10-year period compared to 6.5% for all farms in Canada.

The return on assets averaged 4.39% over the 10-year period compared to 4.84% for all farms in Canada.



Source: Statistics Canada, Corporate Taxfiler Database, various years.



Source: Statistics Canada, Corporate Taxfiler Database, various years.



## Rates of return in farming also vary by farm type

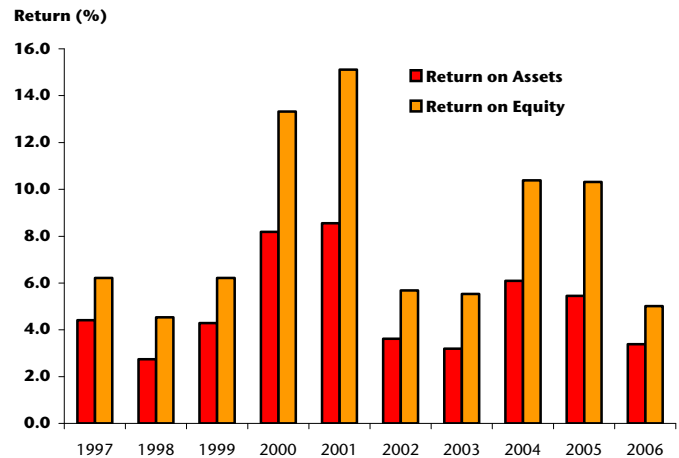
- **The hog sector also had significant fluctuations in returns.**

In 2006, return on assets and return on equity decreased significantly for incorporated hog farms. In 2006, rates fell as hog farms became less competitive with the appreciation of the Canadian dollar and the increase in feed prices.

The return on equity in the hog sector averaged 8.23% over the 10-year period, compared to 6.5% for all farms in Canada.

The return on assets in the hog sector averaged 4.99% over the 10-year period, compared to 4.84% for all farms in Canada.

**Chart C4.41**  
Rates of Return for Hog Farms,  
1997-2006



Source: Statistics Canada, Corporate Taxfiler Database.

Rates of return on asset and on equity are calculated for incorporated farms with \$50,000 or more in revenue or \$50,000 or more in assets.



## SECTION C5

# **Agricultural Input and Service Suppliers**

Input and service suppliers, ranging from multinational firms and commodity brokers to small local businesses, play a major role in the Canadian agriculture and agri-food system. Higher fuel prices and increasing demand have contributed to rising input prices globally with significant implications for operating expenses. In order to reduce operating expenses many producers purchase inputs through co-operatives, purchase inputs during off-season periods, or adopt energy-efficient practices.

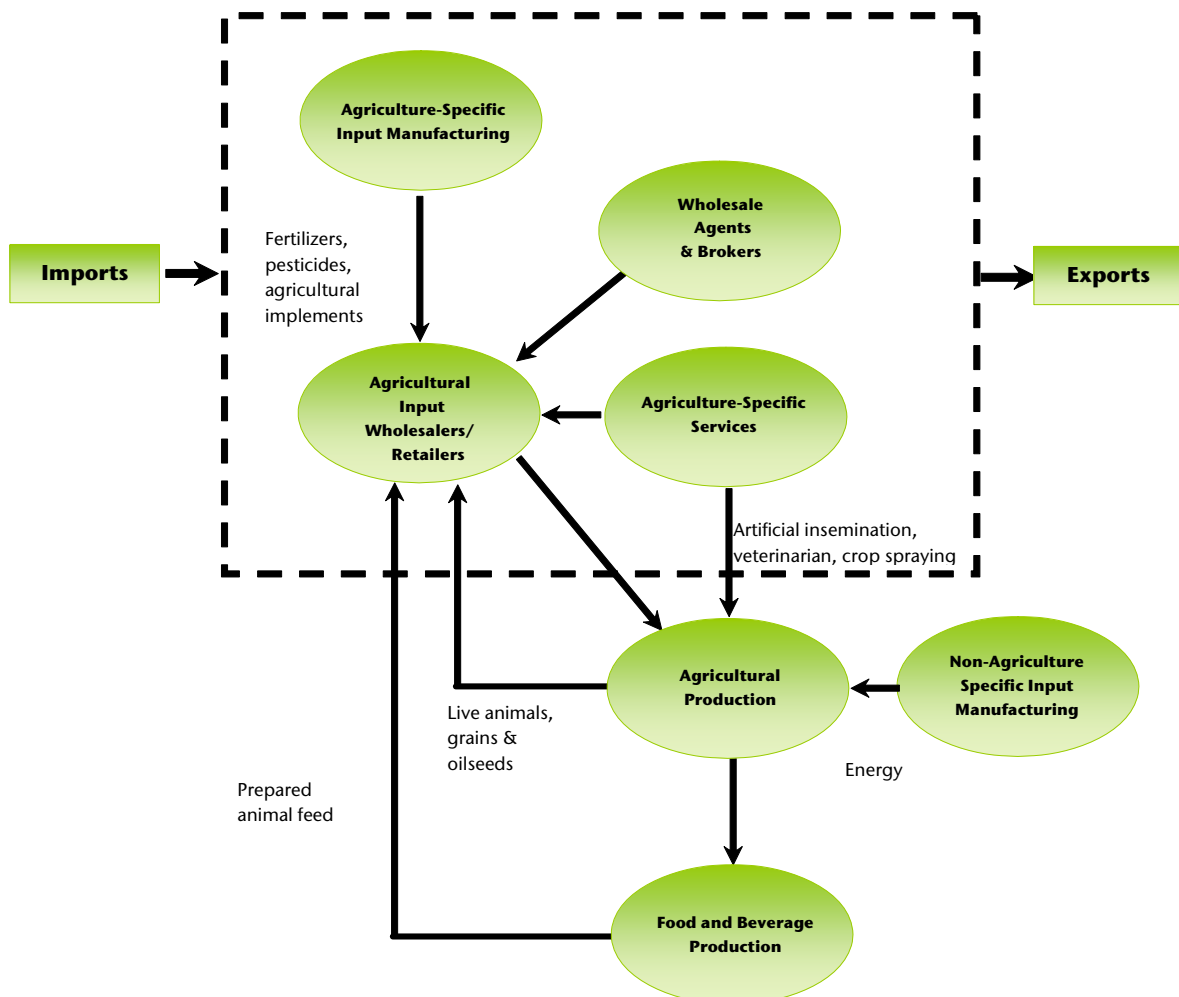
## Input suppliers are a whole value chain

- **Agriculture-specific input and service suppliers constitute a whole value chain within the agriculture and agri-food system. They include input manufacturers, service providers, and retailers/wholesalers.** They supply and support primary agriculture, and at the same time act as buyers of products from downstream industries (e.g. prepared animal feed from grain and oilseed mills or feeder calves from cow-calf operations).

Agriculture-specific input and service suppliers are heterogeneous. They range from multinational firms producing agricultural machinery and implements to small local businesses selling feed and pesticides, and from international commodity brokers to the next-door neighbour doing custom work.

Chart C5.1

The Value Chain of Agriculture-Specific Input and Service Suppliers

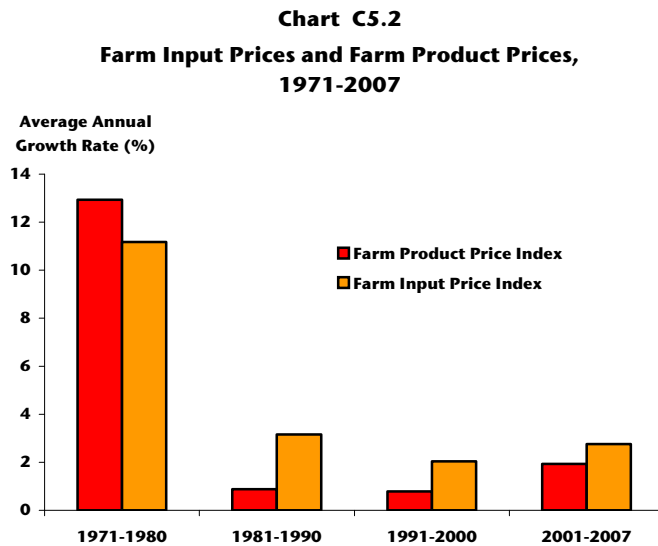


Source: AAFC.

## Input prices have steadily increased around the world

- **Since 1981, the increase in farm product prices has not kept pace with increases in farm input prices.**

The growth rates for both input and output prices, which had slowed in the 1980s and in the 1990s, are rising again in the face of higher commodity prices.



Source: Statistics Canada.

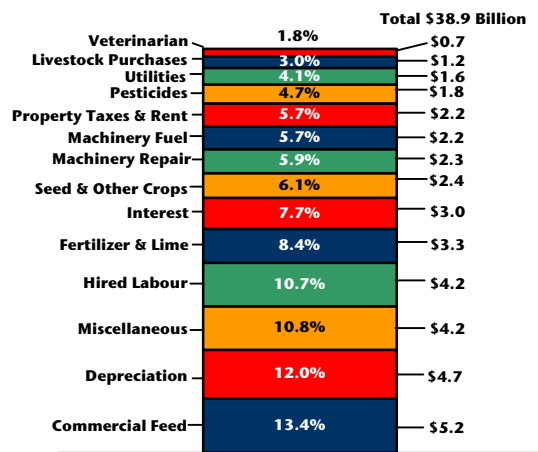
- **In 2007, farm net operating expenses and depreciation totalled \$38.9 billion**

Agriculture producers spent \$38.9 billion on operating expenses after rebates.

Agriculture producers also incurred another \$4.7 billion in depreciation charges.

Commercial feed is the largest individual expense for agriculture producers at \$5.2 billion in 2007, followed by depreciation (at \$4.76 billion) and miscellaneous and hired labour costs, both at \$4.2 billion. Higher feed costs are affecting livestock producers in particular.

**Chart C5.3**  
**Farm Net Operating Expenses and Depreciation, 2007**

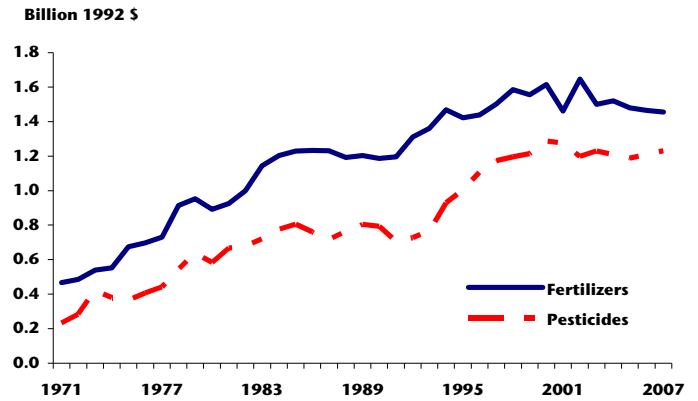


Source: Statistics Canada.

**Chemical input usage has been increasing, although higher prices and environmental concerns have recently dampened their use**

- **Fertilizer and pesticide consumption has been steadily growing over time. As a result, agricultural yields continue to increase. However, with higher prices for fertilizer and concerns about the environmental impact of their use, chemical input usage stabilized in 2007.**

**Chart C5.4**  
Chemical Input Usage in Farming, 1971-2007

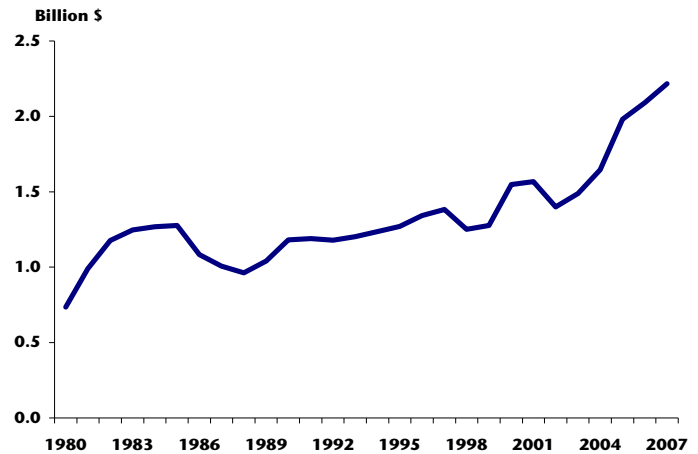


Source: Statistics Canada and AAFC calculations.

- **Fuel prices are a particularly-important contributor to the higher costs of production.**

Farm expenses on machinery fuel have risen significantly since 2004 due to increases in fuel prices.

**Chart C5.5**  
Farm Expenses on Machinery Fuel, 1980-2007



Source: Statistics Canada.

## Producers purchase a significant proportion of their inputs through co-operatives

- **Co-operatives of farm supplies are businesses owned by farmers, which strive to provide high quality, affordable farm supplies to farmers.**

The surplus generated by these co-operatives is returned to farmer members, thereby contributing to farm incomes.

- **The market share of co-operative sales of farm petroleum rose between 1986 and 2005,** primarily due to expanded operations in Western Canada.

**However, there was a significant decline in co-operatives' market share in fertilizer and chemical sales between 2001 and 2005.** A contributing factor was the demutualization of Agricore Co-operative in 2001 and Saskatchewan Wheat Pool in 2005, which had previously sold significant quantities of fertilizer and chemicals.

- **Total co-operative supply sales in 2005 were \$3.8 billion, an increase from \$3.4 billion in 2004.**

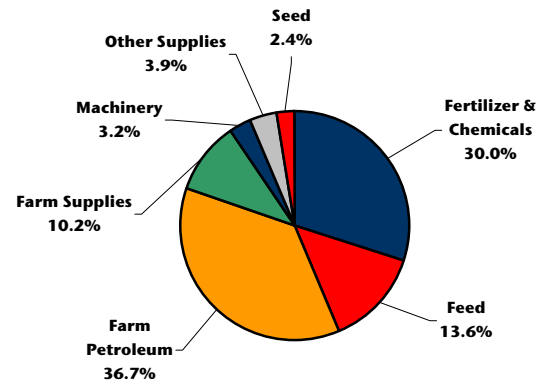
Co-operatives sell a wide range of supplies from fertilizer and chemicals to feed, farm machinery, farm supplies (such as water bowls and wheelbarrows) and non-farm supplies (such as home garden seeds and clothing).

**Chart C5.6**  
Market Shares of Co-operatives in Farm Supplies, 1986-2005

|                                   | 1986                          | 1991 | 1996 | 2001 | 2005 |
|-----------------------------------|-------------------------------|------|------|------|------|
|                                   | <b>% of Farm Expenditures</b> |      |      |      |      |
| <b>Fertilizer &amp; Chemicals</b> | 31                            | 36   | 35   | 38   | 13   |
| <b>Farm Petroleum</b>             | 22                            | 29   | 27   | 41   | 52   |
| <b>Seed</b>                       | 23                            | 17   | 17   | 8    | 8    |
| <b>Feed</b>                       | 26                            | 25   | 17   | 15   | 14   |

Source: Co-operatives Secretariat, AAFC and Statistics Canada.

**Chart C5.7**  
Co-operative Supply Sales, 2005



Source: Co-operatives Secretariat, AAFC.

Note: Excludes wholesaler sales.





## SECTION C6

# Natural Resource Use and Environmental Impacts

Agricultural production depends on the availability and quality of land and water. Cropping choices, farming practices, and input use patterns will vary in response to market conditions, as well as various environmental factors. Environmental effects of agriculture will vary in similar ways, partly because of variations in crop choice and cultivation methods and partly because of regionally-specific environmental conditions.

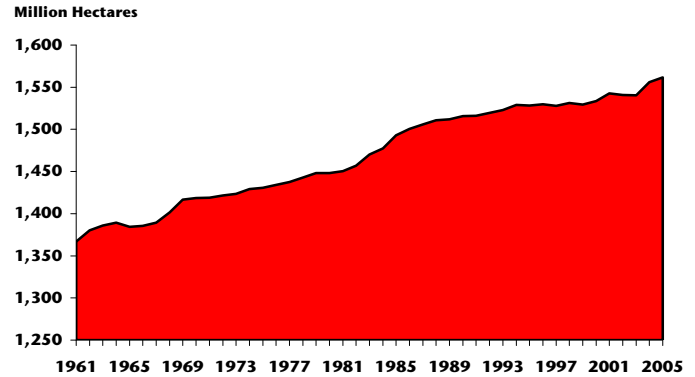


## Canada is endowed with a relative abundance of arable land

- There has been an expansion of agricultural production worldwide since 1961, with the area of arable land and permanent cropland increasing from 1.37 to 1.57 billion hectares.

During the same period, Canada's arable land and permanent cropland area remained relatively constant at 52 million hectares.

**Chart C6.1**  
World Arable Land and Permanent Cropland<sup>1</sup>, 1961-2005



Source: Food and Agriculture Organization of the United Nations (FAO).  
<http://faostat.fao.org>

<sup>1</sup> See Glossary.

- Canada ranks second in the world for the availability of arable land per person.

This relative abundance underpins our status as a large net exporter of agricultural products.

**Chart C6.2**  
Arable Land in Canada Relative to Other Countries, 2005

|               | Arable land<br>( <sup>1</sup> 000 ha) | % of world<br>arable land | Population<br>( <sup>1</sup> 000 people) | ha/person   | Rank     |
|---------------|---------------------------------------|---------------------------|--|-------------|----------|
| Australia     | 49,742                                | 3.2                       | 20,000                                   | 2.49        | 1        |
| <b>Canada</b> | <b>52,110</b>                         | <b>3.3</b>                | <b>32,000</b>                            | <b>1.63</b> | <b>2</b> |
| Russia        | 123,581                               | 7.9                       | 143,000                                  | 0.86        | 3        |
| Ukraine       | 33,353                                | 2.1                       | 47,000                                   | 0.71        | 4        |
| U.S.          | 177,178                               | 11.3                      | 296,000                                  | 0.60        | 5        |
| Brazil        | 66,600                                | 4.3                       | 184,000                                  | 0.36        | 6        |
| Nigeria       | 35,000                                | 2.2                       | 134,000                                  | 0.26        | 7        |
| Indonesia     | 36,600                                | 2.3                       | 220,000                                  | 0.17        | 8        |
| India         | 169,650                               | 10.9                      | 1,102,000                                | 0.15        | 9        |
| China         | 156,327                               | 10.0                      | 1,304,000                                | 0.12        | 10       |

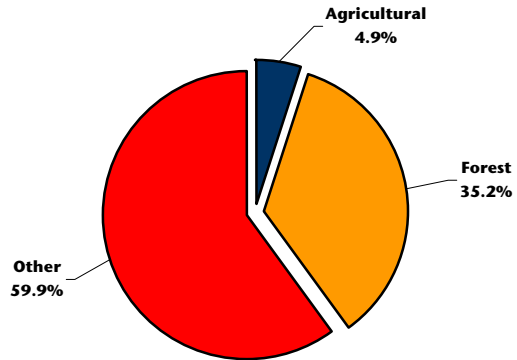
Sources: United Nations, Demographic Yearbook 2005.

Food and Agriculture Organization of the United Nations (FAO).  
<http://faostat.fao.org>

**Canada's land suitable for agricultural production is relatively small, even though we are the world's largest country**

- In 2001, only 5% of total land was used for agriculture.

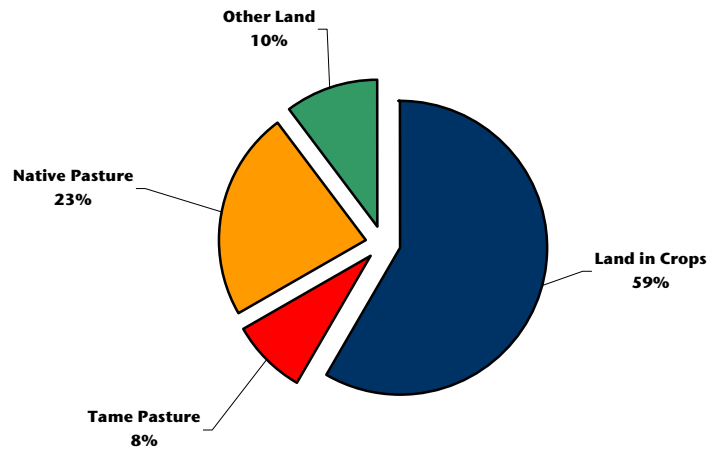
**Chart C6.3**  
Share of Agricultural Land and Land in Forest to Total Land, 2001



Source: Natural Resources Canada, Canada's Forest Inventory.

- In 2006, about 60% of Canada's agricultural land was used for crops. Pastures represent about 30% of agricultural land use.

**Chart C6.4**  
Canadian Agricultural Land Use, 2006



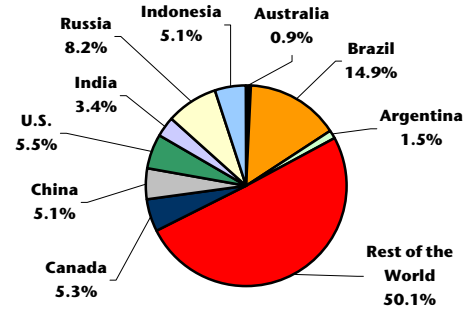
Source: Census of Agriculture 2006.

**Fresh water from renewable sources is unevenly distributed worldwide, and in most countries agriculture is a major user of this resource**

- **The Food and Agriculture Organization (FAO) of the United Nations has developed an index that reflects the water resources theoretically available for development from all sources. The index is called, Total Actual Renewable Water Resources (TARWR).**

According to this index, there are more than 55 thousand cubic kilometers of TARWR per year on the earth. Brazil, Russia, the U.S., and Canada together possess almost 34% of the global TARWR. China and India, each having a population exceeding a billion, possess just 5% and 3% of the global TARWR, respectively.

**Chart C6.5**  
Share of Major Countries in Global Renewable Water Resources, 1998-2002 Average

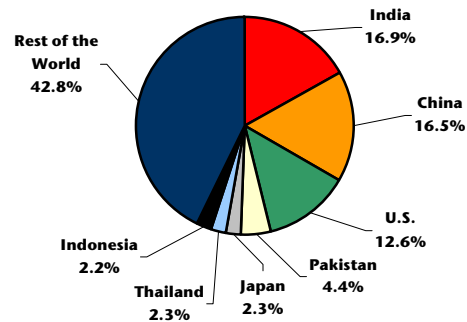


Source: Calculated from AQUASTAT database of the Food and Agriculture Organization (FAO).

- **On average, between 1998 and 2002, only about 7% of TARWR/year was withdrawn.**

India, China, and the U.S. accounted for almost half of the world's water withdrawals. Globally, about 70% of water withdrawals are for agriculture.

**Chart C6.6**  
Share of Selected Countries in World Water Withdrawal, 1998-2002 Average

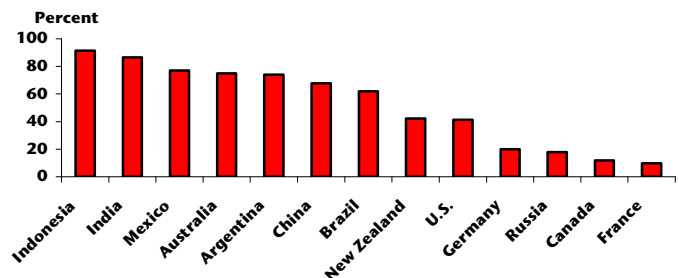


Source: Calculated from AQUASTAT database of Food and Agriculture Organization (FAO).

- **Water withdrawal for agriculture amounted to more than two-thirds of total water withdrawal in Indonesia, India, Australia, Mexico, Argentina, Brazil, and China.**

In contrast, only about 12% of the water withdrawal in Canada was used for agriculture, while industrial use amounted to 69%.

**Chart C6.7**  
Agricultural Water Withdrawal as a Percentage of Total Water Withdrawal in Selected Countries, 1998-2002 Average



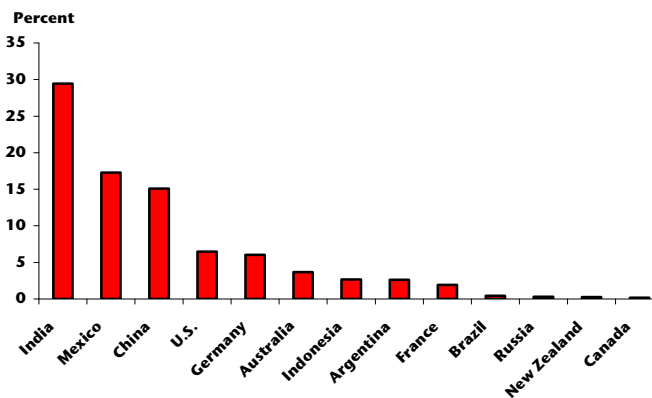
Source: Calculated from AQUASTAT database of the Food and Agriculture Organization (FAO).

**In Canada, agriculture uses a relatively small share of its abundant renewable water resources, mostly for irrigation and livestock**

- **In Canada, only 0.18% of the country's total renewable water resources were used for agriculture, whereas in India about 30% of total renewable water resources were for agricultural use.**

Mexico and China also used a high proportion of their renewable water resources for agriculture.

**Chart C6.8**  
**Agricultural Water Withdrawal as a Percentage of Total Renewable Resources in Selected Countries, 1998-2002 Average**



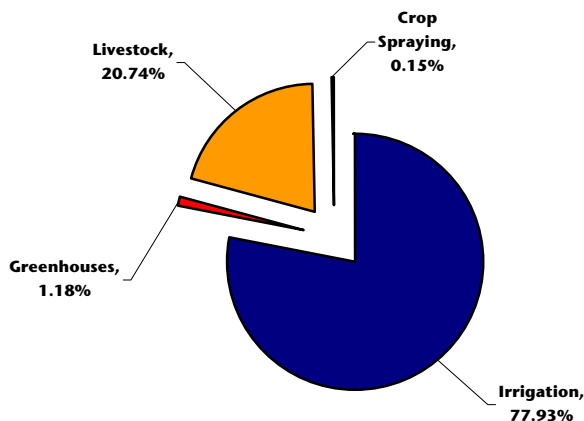
Source: Calculated from AQUASTAT database of the Food and Agriculture Organization (FAO).

- **In 2006, total water use by the Canadian agricultural sector amounted to approximately 4.6 billion cubic metres, an increase of 25% over 2001.**

Water needed to irrigate crops is by far the most important type of usage followed by livestock use. These two types of water usage make up close to 99% of the Canadian agricultural sector's total water use.

Although still a small share of total agricultural water use, water quantity used in greenhouses increased by more than 21% between 2001 and 2006.

**Chart C6.9**  
**Distribution of Total Agricultural Water Use in Canada, by Type, 2006**



Source: AAFC calculations using the Canadian Regional Agriculture Water Use Model (CRAWUM).

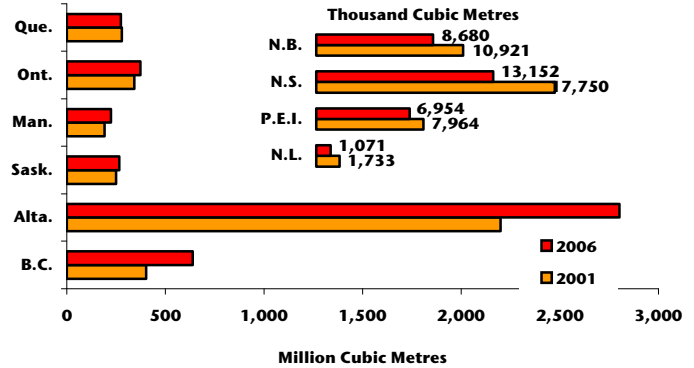
**Water use by agriculture is more important in moisture-deficit areas, where fruits and vegetables are produced, and where livestock is concentrated**

- In 2006, Alberta, with its large livestock industry and moisture deficit, accounted for 60% of total Canadian agricultural water use, while horticultural crop production made British Columbia the second most important agricultural water user in the country.

Total agricultural water use fell in the Atlantic provinces and Quebec, mostly due to a small decrease in livestock production.

Expansion of greenhouses, irrigated areas and livestock production between 2001 and 2006, led to increased water use by the agricultural sector in the Western provinces and Ontario.

**Chart C6.10**  
Agricultural Total Water Use by Province, 2001 and 2006



Source: AAFC calculations using the Canadian Regional Agriculture Water Use Model (CRAWUM).

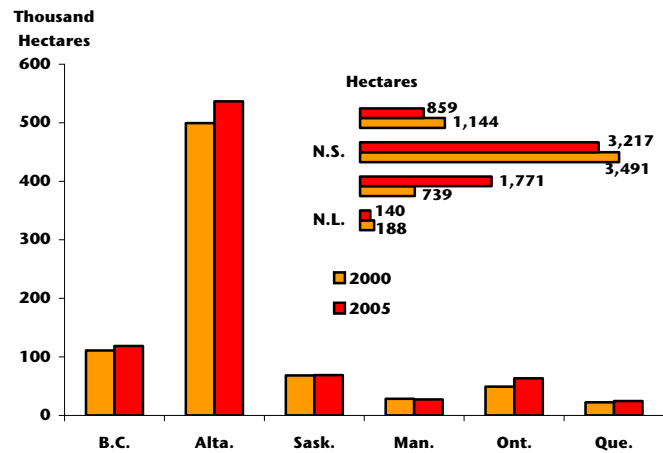
- In 2005, Canada had about 845 thousand hectares of irrigated cropland, representing a small increase since 2000.

In many regions, irrigation is not used on a consistent basis, but only when rainfall is insufficient.

Alberta is the province with the largest irrigated area, accounting for 63% of the national total, followed by British Columbia at 14%.

Between 2000 and 2005, a notable increase in irrigated areas occurred in Prince Edward Island, Ontario and Alberta.

**Chart C6.11**  
Irrigated Areas by Province, 2000 and 2005



Source: Census of Agriculture, 2006.

**In response to market conditions as well as to better conserve soils, Canadian farmers are changing the way they use and till their land**

- **Land allocated to crops has declined between 2001 and 2006 in all provinces with the exception of Quebec and Newfoundland.**

In contrast, land allocated to cover crops such as hay and alfalfa has seen an increase in every province with the exception of British Columbia, Alberta and Newfoundland. There has been an important shift towards seeded pasture in the Western provinces, while in the East the trend has been the opposite.

**Chart C6.12**  
**Land Use Change by Province, 2001 and 2006**

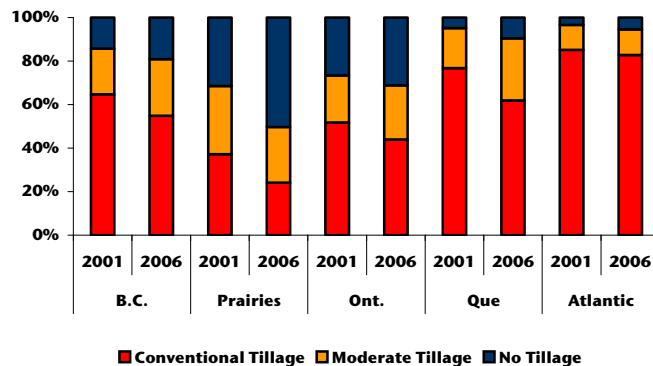
|        | Percentage Change in Acreage Between 2001 and 2006 |              |         |                |                |
|--------|--|--------------|---------|----------------|----------------|
|        | Cropland   | Summerfallow | Hayland | Seeded Pasture | Native Pasture |
| B.C.   | -10,1%   | -30,4%       | -2,3%   | 5,5%           | 24,2%          |
| Alta.  | -0,4%  | -26,7%       | -3,2%   | 11,3%          | -2,2%          |
| Sask.  | -7,1%  | -22,4%       | 37,4%   | 39,6%          | 1,0%           |
| Man.   | -2,1%  | -50,5%       | 7,6%    | 29,9%          | -2,0%          |
| Ont.   | -0,7%  | ---          | 2,3%    | -3,1%          | -15,3%         |
| Que.   | 0,9%   | ---          | 9,4%    | -19,4%         | -14,7%         |
| N.B.   | -2,6%  | ---          | 6,2%    | -6,6%          | -7,1%          |
| N.S.   | -7,0%  | ---          | 0,7%    | 2,2%           | -3,6%          |
| P.E.I. | -8,4%  | ---          | 9,8%    | -8,5%          | -4,7%          |
| N.L.   | 47,4%  | ---          | -1,5%   | -8,0%          | 45,1%          |

Source: Census of Agriculture, 2006

- **No-till practices are becoming more popular as they can reduce fuel and fertilizer costs while helping conserve soils.**

With the exception of Newfoundland, no-till practices increased while conventional tillage decreased in all provinces. In 2006, about 70% of cropland was cultivated using no-till or moderate tillage.

**Chart C6.13**  
**Tillage Practices by Region, 2001 and 2006**



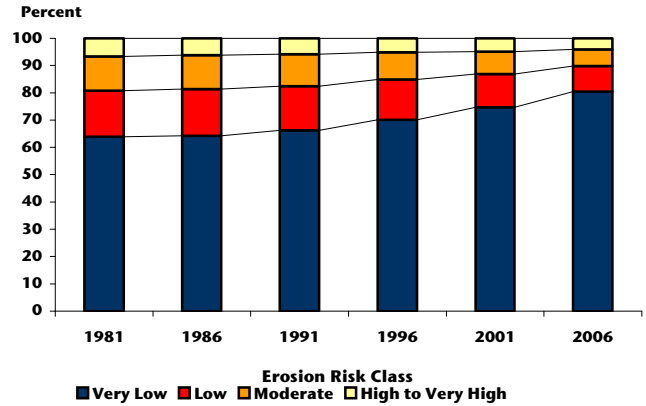
Source: Census of Agriculture, 2006.

## More cover crops and pastures combined with less intensive tillage practices help reduce soil erosion

- **The combined risk of erosion from wind, water, and tillage has decreased substantively, especially over the last 15 years.**

Currently, only about 10% of all cropland area is subject to moderate to very high erosion risk. The reduction in erosion risk is the result of a general decrease in tillage intensity, summer-fallow use, and area of annual crops on the highly erodible land. The majority of area with the highest erosion risk is currently the more sloping lands in Central and Eastern Canada.

**Chart C6.14**  
Breakdown of Total Cropland Area by Erosion Risk Classes, 1981-2006



Source: McConkey, B.G., Lobb, D.A., Li, S., and Black, J.M.W. (forthcoming) 2009.

## Canadian farmers have been raising more animals and applying less fertilizer to their land in recent years

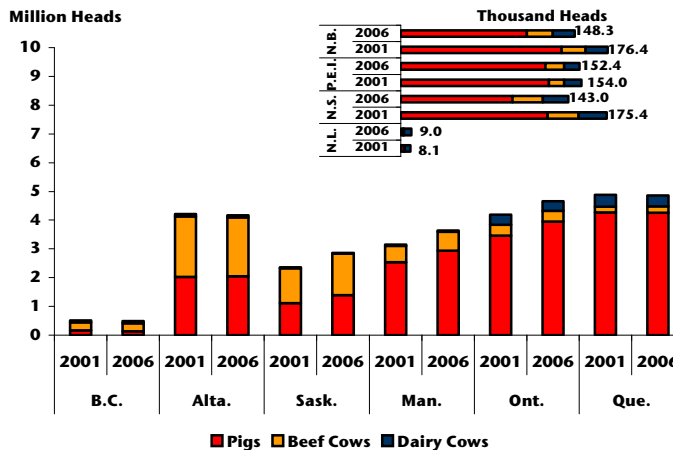
- **Quebec, Ontario and Alberta have the highest concentration of pigs, beef and dairy cows.**

Between 2001 and 2006, the number of pigs has been increasing in the Prairie provinces as well as in Ontario.

In the same period, the beef herd grew in all provinces except British Columbia, Alberta and Nova Scotia.

British Columbia, Manitoba and Newfoundland were the only provinces which saw an increase in the size of their dairy herds.

**Chart C6.15**  
Livestock Numbers by Province, 2001 and 2006

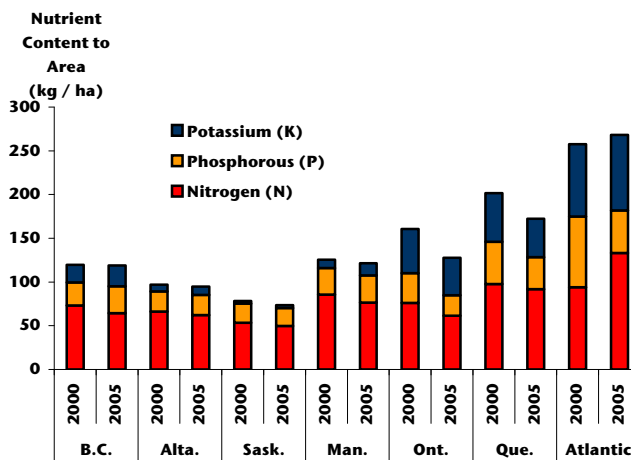


Source: Census of Agriculture, 2006.

- **Between 2001 and 2005, Canadian farmers have been applying less nitrogen to their crops with the exception of the Atlantic provinces, where nitrogen application to land increased by more than 40%.**

As a consequence, total nutrient content to land ratio decreased in most provinces, especially in Ontario and Quebec, but increased in the Atlantic provinces.

**Chart C6.16**  
Nutrient Content to Fertilized Area by Province, 2000 and 2005



Sources: Census of Agriculture, 2006.  
Canadian Fertilizer Institute.



# Nutrients from manure and fertilizer application can impact water and air quality

- From 1981 to 2006, there has been an overall increase in both nitrate-nitrogen concentrations and over-winter nitrogen losses.

In 2006, the estimated nitrate losses from agricultural soils in the Atlantic provinces, (from 33.8 to 40 kg N/ha), were greater than in Quebec (22.9 kg N/ha) and Ontario (14.7 kg N/ha), whereas the Prairie provinces (0.2 to 0.3 kg N/ha) had the lowest losses.

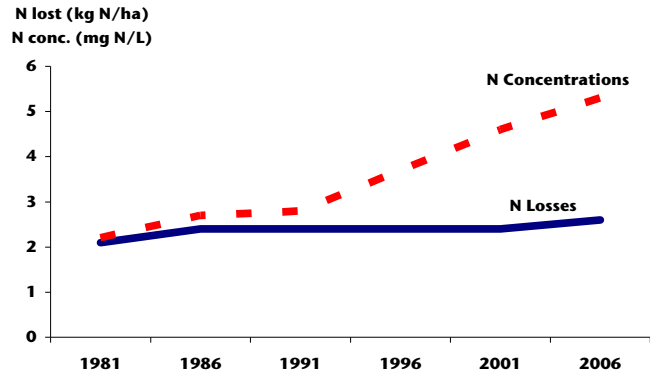
Manitoba (11.6 mg N/L), Quebec (11.7 mg N/L), New Brunswick (14.2 mg N/L), Nova Scotia (11.4 mg N/L) and Prince Edward Island (11.6 mg N/L) all had estimated nitrate concentrations above the drinking water guidelines of 10 mg N/L in 2006.

Increases in fertilizer use, livestock numbers, and legume crop acreage are some of the factors that contributed to the increase in the losses and concentrations.

- Between 2001 and 2006, greenhouse gas emissions from primary agriculture rose by 4% to reach 60.8 million tonnes of CO<sub>2</sub> equivalent.

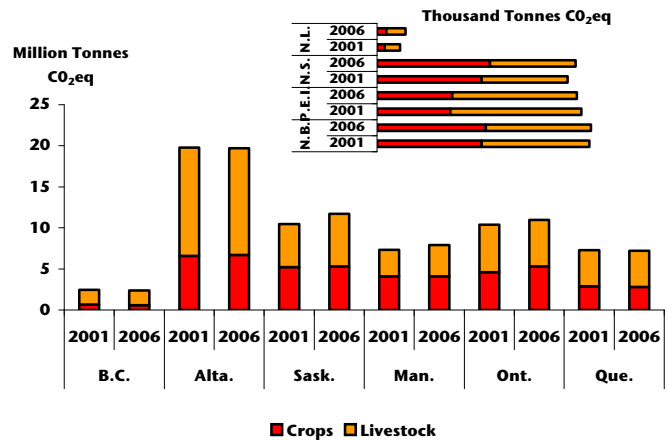
The main contributor was livestock production, which accounted for about 60% of this total on average. On a provincial basis, emissions are higher where animals are concentrated but have been relatively stable over time, with the exception of Saskatchewan and Manitoba where there has been an expansion of hog and beef production since 2001.

**Chart C6.17**  
Estimated National Over-Winter Nitrogen Losses and Nitrate-Nitrogen Concentrations in Drainage Water, 1981-2006



Source: De Jong, R., Drury, C.F., and Yang, J.Y. (forthcoming) 2009.

**Chart C6.18**  
GHG Emission Levels, 2001 and 2006, by Sector and Province



Source: Environment Canada. 2008. National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1990–2006.



# SECTION D

## **Government and the Agriculture and Agri-Food Sector**





# SECTION D1

## **Government Expenditures**

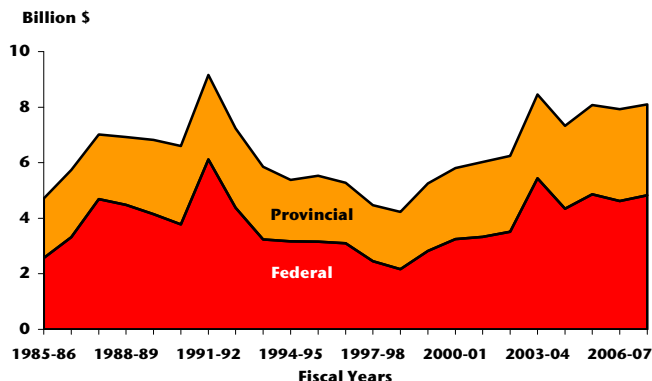
Government expenditures in support of the agriculture and agri-food sector rose to record levels in 2007-08. As a share of sector GDP, government expenditures rose slightly to 40%. Program payments made up the largest portion of government expenditures to the sector.

## Government expenditures in support of the agriculture and agri-food sector have grown over time but have declined as a share of GDP

- **Federal and provincial governments provide a significant level of support to the agriculture and agri-food sector in Canada with an increased trend since 1998-99.**

Total government expenditures in support of the agriculture and agri-food sector were estimated to be \$8.1 billion for the 2007-08 fiscal year. This is the third-largest level of government support recorded for the sector in Canada.

**Chart D1.1**  
Government Expenditures in Support of the Agriculture and Agri-Food Sector, 1985-86 to 2007-08 Fiscal Years



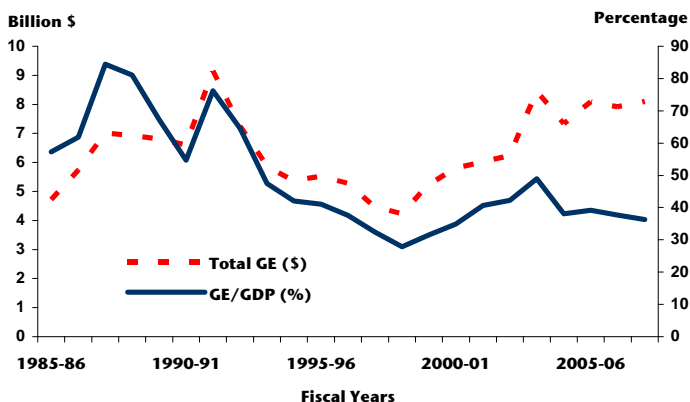
Source: AAFC.

Note: 2007-08 figures are forecasts.

- **Government expenditures in support of the agriculture and agri-food sector have grown over the last year, but declined as a share of GDP.**

During the 1990s, government expenditures in dollar terms and as a share of agriculture and agri-food GDP were declining. Starting in 1999-2000, both increased, but at different rates. More recently, government expenditures have continued to increase in dollar terms, but have declined as a share of agriculture and agri-food GDP.

**Chart D1.2**  
Government Expenditures in Support of the Agriculture and Agri-Food Sector, as a Share of GDP, 1985-86 to 2007-08



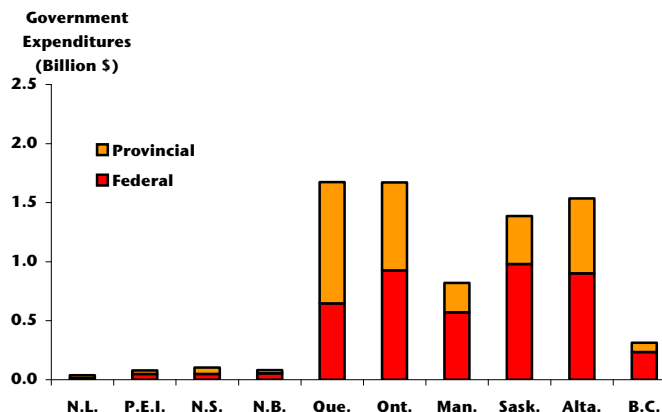
Source: AAFC.

Note: 2007-08 figures are forecasts.

## Government expenditures in support of the agriculture and agri-food sector vary by province

- **Although the federal government contributes a larger share of total support in most provinces, there are variations across provinces.** Provincial governments in Quebec, Nova Scotia, and Newfoundland and Labrador provided a larger share of total support in the 2007-08 fiscal year in the provinces.

**Chart D1.3**  
Government Expenditures in Support of the Agriculture and Agri-Food Sector by Province, 2007-08 Fiscal Year



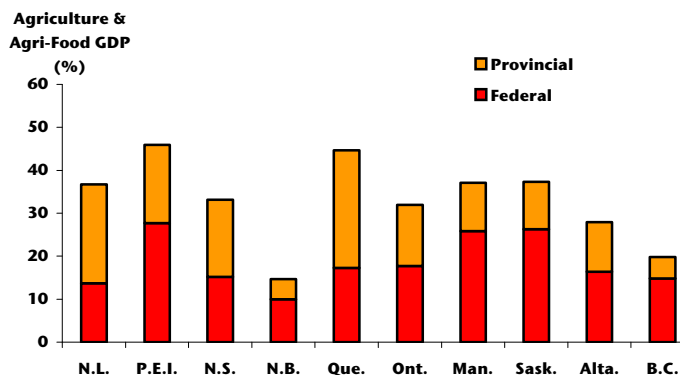
Source: AAFC.

Note: 2007-08 figures are forecasts.

- **In the 2007-08 fiscal year, total government expenditures in support of the agriculture and agri-food sector in Canada were estimated at 36.3% of agriculture and agri-food sector GDP, but there are variations across provinces.**

The agriculture and agri-food sector in Prince Edward Island, Quebec, Saskatchewan and Manitoba received the most government support (when expressed as a share of agriculture and agri-food GDP), while New Brunswick and British Columbia received the lowest support.

**Chart D1.4**  
Government Expenditures in the Agriculture and Agri-Food Sector as a Share of Sector GDP by Province, 2007-08 Fiscal Year



Source: AAFC.

Note: 2007-08 figures are forecasts.

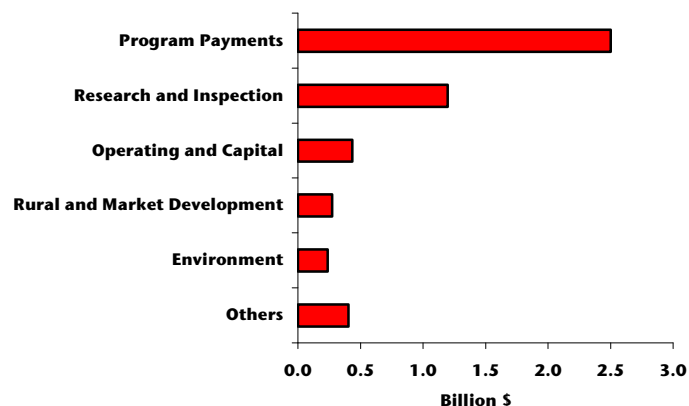
## Program payments make up the largest portion of federal and provincial government support

- In the 2007-08 fiscal year, program payments were estimated to account for the largest share of federal government expenditures in support of the agriculture and agri-food sector in Canada.

Program payments accounted for 50% of total federal government expenditures to the sector in the 2007-08 fiscal year.

Research and inspection expenditures are the second most important government expenditures, accounting for 24% of the total, followed by operating and capital expenditures, at 9%.

**Chart D1.5**  
Federal Government Expenditures in Support of the Agriculture and Agri-Food Sector by Major Category, 2007-08 Fiscal Year



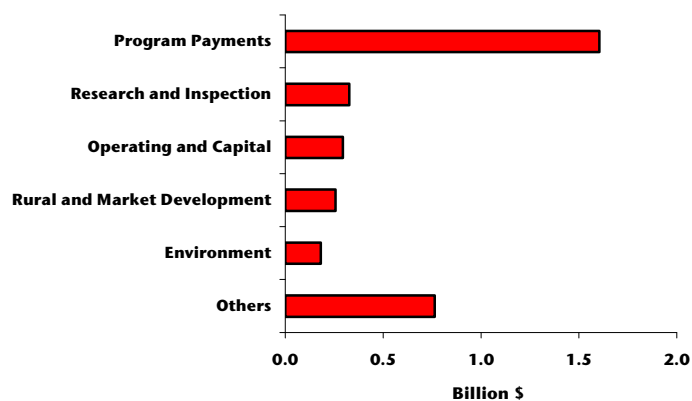
Source: AAFC.

Note: 2007-08 figures are forecasts.

- At the provincial level, program payments are also the most important government expenditure in support of the agriculture and agri-food sector.

Program payments accounted for 47% of total provincial government expenditures to the sector in the 2007-08 fiscal year. However, only 10% was spent on research and inspection compared to 24% at the federal level.

**Chart D1.6**  
Provincial Government Expenditures in Support of the Agriculture and Agri-Food Sector by Major Category, 2007-08 Fiscal Year



Source: AAFC.

Note: 2007-08 figures are forecasts.

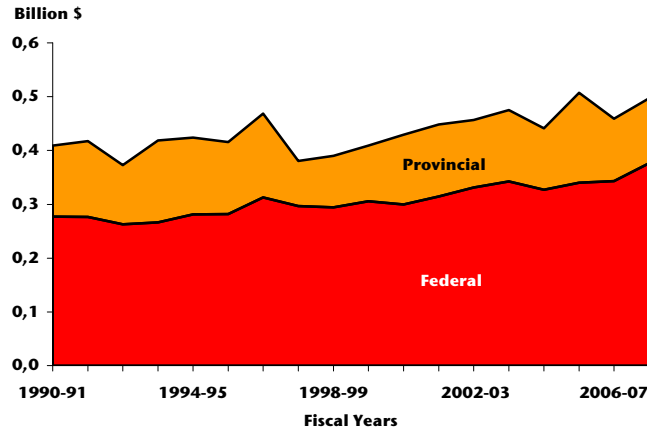
Government expenditures on program payments include transfers made to agricultural producers and the sector and may include statutory programs such as Production Insurance, Canadian Agricultural Income Stabilization (CAIS), Advanced Payments and Provincial Stabilization.

**Public research expenditures in agriculture and agri-food are important investments for the future growth of the sector**

- **There is an increased trend in total publicly-funded research expenditures for the agriculture and agri-food sector over the last decade with a peak of \$507 million in the 2005-06 fiscal year.**

In Canada, publicly-funded research expenditures in agriculture are funded predominantly by the federal government. On average, federal expenditures have accounted for 71% of total public expenditures over the past ten years (1998-99 to 2007-08).

**Chart D1.7  
Government Research Expenditures on  
Agriculture and Agri-Food,  
1990-1991 to 2007-2008 Fiscal Years**



Source: AAFC.

Note: 2007-08 figures are forecasts.

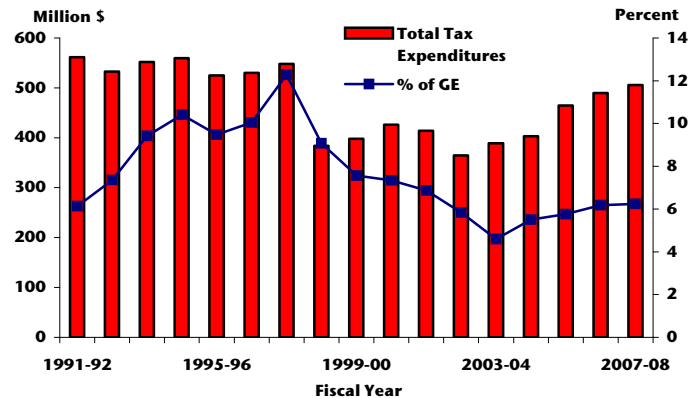


## Governments also use favourable tax measures to support the agriculture and agri-food sector

- **Foregone tax revenue (tax expenditures) is a source of government support to the agriculture and agri-food sector. From 1990-91 to 2007-08, tax expenditures represented 7.3% of total government support.**

In fiscal year 2007-08, provincial tax exemptions and rebates associated with primary agriculture were estimated at \$506 million. Tax expenditures have been increasing since 2002-03.

**Chart D1.8**  
Support to Farm Producers Through Tax Rebates and Exemptions, 1991-92 to 2007-08 Fiscal Years



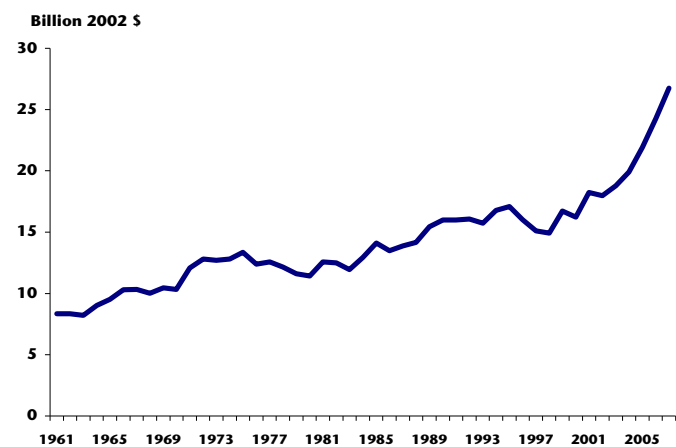
Source: AAFC.

Note: 2007-08 figures are forecasts.

- **The stock of total public infrastructure has increased substantially since 1961.** The last decade has seen unprecedented growth, at an average annual rate of nearly 6%. This contrasts with the previous decade, where growth averaged only 1% per year.

The stock of total public infrastructure includes buildings, roads, sewers and all other fixed capital owned by federal, provincial, territorial and municipal governments. Research has shown that growth in the stock of public infrastructure has been an important contributor to productivity growth in the food and beverage processing industries.

**Chart D1.9**  
The Stock of Public Infrastructure in Canada, 1961-2007

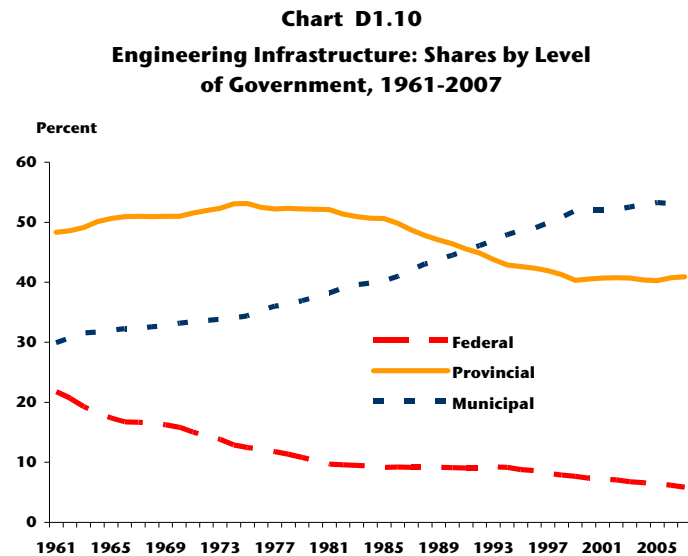


Source: Statistics Canada.

## Public infrastructure investment is important for economic growth and productivity growth in the agriculture and agri-food sector

- **The share of engineering infrastructure held by provinces and municipalities has changed significantly since the early 1980s.** Over 50% of the Canadian public stock of engineering infrastructure is held and maintained by local governments. This has come about, in part, because provincial and federal governments have shifted responsibility for engineering capital to municipalities and other local governments.

The most important elements of engineering infrastructure are roads, highways and sewers and sewage treatment facilities. Together, these have typically accounted for about 60% of all public infrastructure in Canada.







## SECTION D2

# **Producer Support Estimates (PSE) and Agricultural Policies in Other Countries**

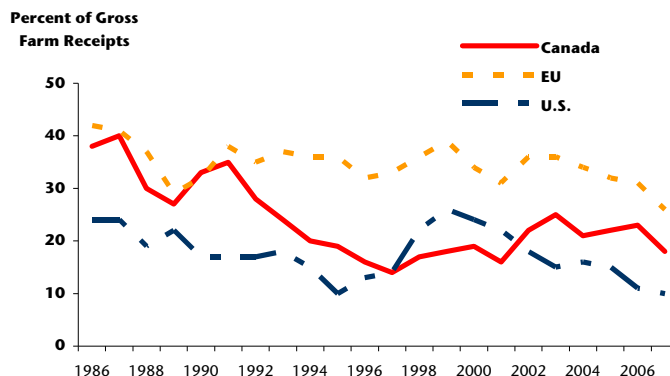
Agricultural policies in Canada and other countries have evolved over time. Changes have been made not only by decreasing the level of support, but also by modifying the type of support. Some countries have made significant reforms to their agricultural policies. The Organisation for Economic Co-operation and Development (OECD) indicators and the World Trade Organization (WTO) classification for domestic support are used to present these policy changes.

## ***In recent years, support to Canadian producers in percentage PSE has risen above that of the U.S., but is still below the EU***

- **In 2007, the PSE for Canada was 18% of gross farm receipts compared to 26% for the EU and 10% for the U.S.**

In 2007, Canadian support to producers declined as it did in most OECD countries. This is because of an increase in value of gross farm receipts and a decrease in market price support (MPS) due to higher world prices for agricultural commodities, except for the U.S. where MPS increased.

**Chart D2.1**  
Percent of PSE, Selected Countries,  
1986-2007



Source: OECD, Trade and Agriculture Directorate, Producer and Consumer Support Estimates, OECD Database 1986-2007.

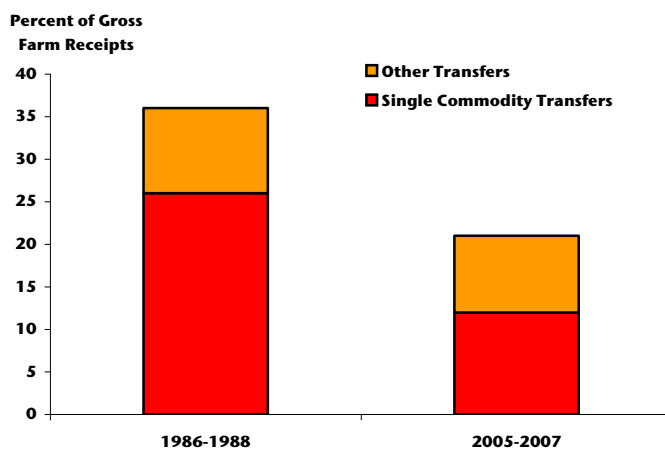
- **Over time, Canada has moved towards more decoupled and less distorting forms of support.**

Support to Canadian agricultural producers dropped from 36% of gross farm receipts in 1986-88 to 21% in 2005-07.

The share of the single commodity transfers has decreased substantially in favour of more decoupled and less distorting forms of support. In 2005-2007, it represents 55% of the total PSE compared to 71% in 1986-88.

Nevertheless, single commodity transfers continue to account for more than half of producers' support in Canada, close to the OECD average of 59%.

**Chart D2.2**  
Composition of Support to Producers,  
Canada, 1986-1988 and 2005-2007



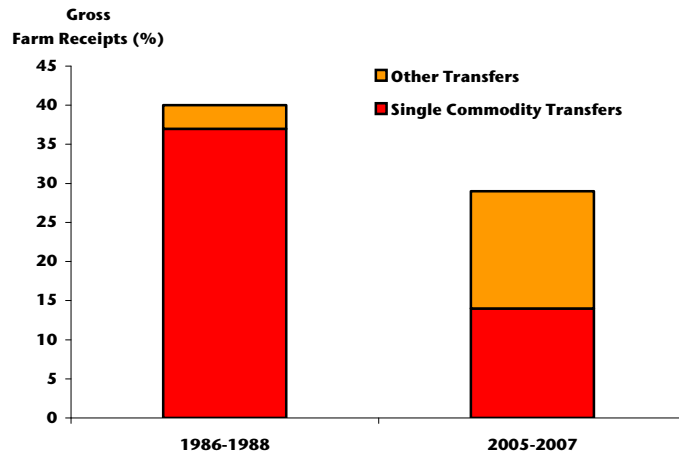
Source: OECD, Agriculture Policies in OECD Countries: At a Glance 2008.

**Developments in policy directions in other countries have moved toward reduced direct support in favour of more general support**

- **Between 1986-88 and 2005-07, the EU reduced its support to agricultural producers from 40% to 29% of gross farm receipts.**

In addition, single commodity transfers have decreased substantially in favour of more decoupled and less distorting forms of support. It represents 48% of the total PSE in 2005-07, compared to 94% in 1986-88. Single commodity transfers account for less than half of producers' support in the EU, and they will probably continue to decrease as a result of the 2003 Common Agricultural Policy reform and the Health Check review.

**Chart D2.3**  
Composition of Support to Producers, EU, 1986-1988 and 2005-2007

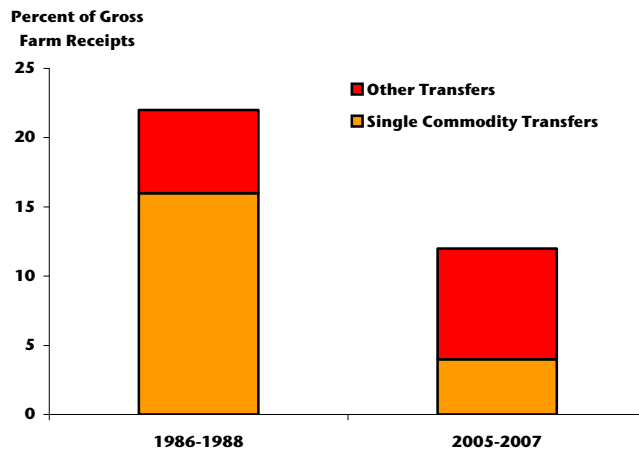


Source: OECD, Agriculture Policies in OECD Countries: At a Glance 2008.

- **Between 1986-88 and 2005-07, the U.S. support to agricultural producers decreased from 22% to 12% of gross farm receipts.**

In addition, single commodity transfers have decreased substantially in favour of more decoupled and less distorting forms of support. They represent 36% of the total PSE in 2005-07, compared to 72% in 1986-88. Even though single commodity transfers have decreased over time, they increased from 31% in 2006 to 39% in 2007 because of increased MPS.

**Chart D2.4**  
Composition of Support to Producers, U.S., 1986-1988 and 2005-2007



Source: OECD, Agriculture Policies in OECD Countries: At a Glance 2008.





## **Glossary**



**Acronyms**

|           |   |
|-----------|---|
| AAFC      | Agriculture and Agri-Food Canada                        |
| BICO      | Bulk, Intermediate, and Consumer-Oriented               |
| BSE       | Bovine Spongiform Encephalopathy                        |
| CAP       | Common Agricultural Policy                              |
| CAIS      | Canadian Agricultural Income Stabilization Program      |
| CANSIM    | Canadian Socio-economic Information Management System   |
| CCA       | Capital Cost Allowance                                  |
| CERI      | Canadian Dollar Effective Exchange Rate Index           |
| CPI       | Consumer Price Index                                    |
| CR4       | Concentration Ratio                                     |
| ECE       | Eligible Capital Property                               |
| EU        | European Union  |
| FAO       | Food and Agriculture Organization of the United Nations |
| FBT       | Food, Beverage and Tobacco                              |
| FDI       | Foreign Direct Investment                               |
| FFN       | Functional Foods and Nutraceuticals                     |
| FPPI      | Farm Product Price Index                                |
| GDP       | Gross Domestic Product                                  |
| IFPRI     | International Food Policy Research Institute            |
| MPS       | Market Price Support                                    |
| NAFTA     | North American Free Trade Agreement                     |
| NAICS     | North American Industrial Classification System         |
| NFI       | Net Farm Income   |
| NPD Group | A global market research company                        |
| OECD      | Organisation for Economic Co-operation and Development  |
| PDI       | Personal Disposable Income                              |
| PSE       | Producer Support Estimate                               |
| PST       | Provincial Sales Tax                                    |
| R&D       | Research and Development                                |
| TARWR     | Total Actual Renewable Water Resources                  |
| TFP       | Total Factor Productivity                               |
| USDA      | United States Department of Agriculture                 |
| USDOE     | United States Department of Energy                      |
| WTO       | World Trade Organization                                |

## The System's Components

### Agriculture and Agri-Food Sector

The agriculture and agri-food sector is composed of all industries whose primary role is to produce food and agricultural products. It encompasses both primary agriculture and food, beverage and tobacco (FBT) processors.

### Canadian Agriculture and Agri-Food System

The Canadian agriculture and agri-food system is a value chain of industries focussed on producing agricultural and food products. It includes agricultural input and service suppliers, primary agriculture, food, beverage and tobacco processors, food retailers/wholesalers, and foodservice establishments.

Unless otherwise noted, component stages of the agriculture and agri-food system are defined according to the North American Industrial Classification System (NAICS). The glossary contains a detailed listing of included industries for each component stage of the system.

### Agricultural Input & Service Suppliers

Agricultural input and service suppliers are composed of the following industries as defined by NAICS:

At the 4-digit level

- 1151 Support Activities for Crop Production
- 1152 Support Activities for Animal Production
- 3253 Pesticide, Fertilizer and Other Agricultural Chemical Manufacturing
- 4171 Farm, Lawn and Garden Machinery and Equipment Wholesaler-Distributors
- 4183 Agricultural Supplies Wholesaler-Distributors

At the 5-digit level

- 33311 Agricultural Implement Manufacturing

### Primary Agriculture

Primary agriculture is composed of the following industries as defined by NAICS:

At the 4-digit level

- 1111 Grain and Oilseed Farming
- 1112 Vegetable and Melon Farming
- 1113 Fruit and Tree Nut Farming
- 1114 Greenhouse, Nursery and Floriculture Production
- 1119 Other Crop Farming
- 1121 Cattle Ranching and Farming
- 1122 Hog and Pig Farming
- 1123 Poultry and Egg Production
- 1124 Sheep and Goat Farming
- 1125 Animal Aquaculture
- 1129 Other Animal Production

### FBT Processors

FBT processors are composed of the following industries as defined by NAICS:

At the 3-digit level

- 311 Food Manufacturing
- 312 Beverage and Tobacco Product Manufacturing

## The System's Components (cont'd)

### Food Retailers/Wholesalers

Food retailers/wholesalers are composed of the following industries as defined by NAICS:

At the 3-digit level

- 411 Farm Product Wholesaler-Distributors
- 413 Food, Beverage and Tobacco Wholesaler-Distributors
- 445 Food and Beverage Stores

At the 5-digit level

- 41911 Farm Product Agents and Brokers
- 41913 Food, Beverage and Tobacco Agents and Brokers
- 44422 Nursery Stores and Garden Centres
- 49312 Refrigerated Warehousing and Storage
- 49313 Farm Product Warehousing and Storage

### Foodservice

Foodservice is composed of the following industries as defined by NAICS:

At the 3-digit level

- 722 Food Services and Drinking Places

At the 4-digit level

- 4542 Vending Machine Operators

### Food Distribution Sector

The food distribution sector is composed of all industries whose primary role is to directly provide and service the final consumer with food and agricultural products. It encompasses food retailers/wholesalers and foodservice establishments.

### Commercial Foodservice

Commercial foodservice includes full-service restaurants, limited-service restaurants, social and contract caterers and taverns.

**Full-Service Restaurants** include licensed and unlicensed fine dining restaurants, family restaurants and restaurant bars.

**Limited-Service Restaurants** include cafeterias, fast-food restaurants, food courts, and take-out and delivery establishments.

**Social Caterers** provide foodservice for special events.

**Contract Caterers** supply foodservice to airlines, railways, institutions and at recreational facilities.

**Taverns** are establishments primarily engaged in serving alcoholic beverages for immediate consumption, such as pubs, cocktail lounges and nightclubs.

## ***The System's Components (cont'd)***

### **Food-Only Processors**

Food-only processors refers to manufacturers of food where food is defined in the narrowest sense (i.e. excludes beverage and tobacco products).

### **Non-Food Processors**

Non-food processors encompasses all industrial uses of farm products other than food or animal feed consumption. It includes bioproducts manufacturers as well as the more traditional non-food industries such as leather tanneries and textile mills.

### **Other and Non-Commercial Foodservice**

Other foodservice includes accommodation, institutional, retail and other foodservice.

**Accommodation Foodservice** is foodservice offered by hotels, motels and resorts.

**Institutional Foodservice** is foodservice in hospitals, residential care facilities, schools, prisons, factories and offices.

**Retail Foodservice** is foodservice operated by department stores and convenience stores.

**Other Foodservice** includes vending machines, movie theatres, stadiums and other seasonal or entertainment operations.

## **Non-Financial Industries**

Non-financial industries are composed of the following industries, as defined by the North American Industry Classification System (NAICS).

|       |  |
|-------|--|
| 11    | Agriculture, Forestry, Fishing and Hunting                               |
| 211   | Oil and Gas Extraction   |
| 213   | Support Activities for Mining  |
| 22    | Utilities  |
| 23    | Construction   |
| 31-33 | Manufacturing  |
| 42    | Wholesale Trade  |
| 44-45 | Retail Trade   |
| 48-49 | Transportation and Warehousing   |
| 51    | Information  |
| 53    | Real Estate and Rental and Leasing                                       |
| 54    | Professional, Scientific, and Technical Services                         |
| 56    | Administrative and Support and Waste Management and Remediation Services |
| 61    | Educational Services   |
| 62    | Health Care and Social Assistance  |
| 71    | Arts, Entertainment, and Recreation                                      |
| 72    | Accommodation and Food Services  |
| 811   | Repair and Maintenance   |
| 812   | Personal and Laundry Services  |

## **Farm Definitions**

### **Census Farm**

An agricultural operation with gross farm receipts > \$2,499 that produces at least one of the following products intended for sale: crops (field crops, tree fruits or nuts, berries or grapes, vegetables, seed); livestock (cattle, pigs, sheep, horses, exotic birds, etc.), animal products (milk or cream, eggs, wool, fur, meat), or other agricultural products (greenhouse or nursery products, Christmas trees, mushrooms, sod, honey, maple syrup products).

### **Commercial Farms**

These are business focussed farms with most of their income derived from farming.

### **Communal Farms/Operators**

This is a system of farms where operators pull production resources together.

### **Corporate Farms**

Corporate farms are farms with an organizational business structure that is incorporated.

### **Non-Commercial Farms**

These are non-business focussed farms.

### **Non-Family Farms**

Farms organized as non-family corporations, co-operatives or communal operations. Also includes farms held in estates or trusts.

### **Unincorporated Farms**

Unincorporated farms are farms with an organizational business structure that is unincorporated such as a sole proprietorship and partnership.

## **Trade Categories**

### **Agriculture and Agri-Food Exports**

Agriculture and agri-food exports include the export of agriculture commodities, food (excluding fish and fish products), non-alcoholic beverages (including bottled water), alcoholic beverages, tobacco products, and floriculture and nursery.

### **Agriculture and Agri-Food Imports**

Agriculture and agri-food imports include the import of agriculture commodities, food (excluding fish and fish products), non-alcoholic beverages (including bottled water), alcoholic beverages, tobacco products and floriculture and nursery.

### **Trade Classification**

Trade statistics for the agriculture and agri-food system are categorized according to the BICO classification system which separates products into three different groupings: bulk, intermediate, and consumer oriented.

- **Bulk (B)**  
Products that have received little or no processing, such as, wheat, feedgrains and oilseeds.
- **Intermediate (I)**  
Products that have received some processing, but generally are not yet ready for final consumption. Examples include wheat flour, vegetable oils and slaughter animals.
- **Consumer Oriented (CO)**  
Products that require little or no additional processing and are basically ready for human consumption. Examples include dairy products, eggs, beef, fresh fruits, and floriculture, as well as canned soups, frozen meals, baby foods, etc.

### **Value-Added Trade**

Value-added exports/imports include exports/imports of all intermediate and consumer-oriented goods.

## **Government Support Categories**

### **Government Expenditures**

Government spending (at all levels) on agriculture and food processing in a year, both direct and indirect, to individuals, agencies or associations.

### **Major Categories of Expenditures**

#### **Development, Trade and Environment-Related Program Expenditures**

Include administration and capital expenditures incurred by the government to work on regional development, marketing and trade, and environmental activities as well as grants and contributions issued by the government for work on these activities.

#### **Operating and Capital Expenditures**

Include government expenditures on general administration and management, and on policy, information and statistical services.

#### **Other Expenditures**

Include government expenditures on food aid and international assistance, extension, and education as well as social program payments.

#### **Program Payment Expenditures**

Include payments for income support and stabilization programs, ad hoc and cost reduction programs, crop insurance programs and financing assistance programs.

#### **Research and Inspection Expenditures**

Include administration and capital expenditures incurred by the government to perform research and inspection activities, as well as grants and contributions issued by the government for work on these activities.

#### **Storage and Freight Assistance Expenditures**

Program payments for storage and freight.

### **Public Infrastructure**

The quantity of physical capital owned by the municipal, provincial and federal governments of Canada. This includes buildings such as schools, libraries and post offices, engineering structures, and machinery such as snow removal vehicles and ambulances.

### **Transportation Infrastructure**

This is a subset of engineering structures, and includes highways, roads, streets, runways, rail track, bridges, and tunnels.



## **Government Support Measures**

### **Market Price Support (MPS)**

Transfers to agricultural producers from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity.

### **Producer Support Estimate (PSE)**

A yearly measure of policy support to farm producers. It is the sum of market price support and budgetary payments to producers, expressed as a percentage of the Gross Farm Receipts.

#### **Gross Farm Receipts**

The value of commodity production plus the direct transfers received by producers in the current year.

### **Single Commodity Transfers**

Transfers to agricultural producers from policy linked to the production of a single commodity such that the producer must produce the designated commodity in order to receive the transfer.

## ***Economic and Statistical Terminology***

### **Arable Land**

FAO defines *arable land* as land under temporary crops, meadow and pasture. FAO defines *permanent cropland* as land cultivated with crops that occupy the land for long periods and need not be replanted after each harvest (e.g. cocoa, coffee, and rubber). For Canada, *permanent cropland* is equal to area on farms that is covered with forest and woodland.

### **Biomass**

The term biomass refers to materials sourced from forestry, agricultural (plant, livestock products or by-products) marine, and aquaculture materials, as well as from industrial and municipal wastes.

### **Bioproducts**

Bioproducts are products (other than food, feed, or medicine) made from renewable biological inputs (often referred to as biomass). The term includes new bio-based products as well as those traditional products which have been adapted to replace non-renewable inputs. Conventionally-made industrial products (such as lumber) are excluded.

### **Capital Cost Allowance**

Capital cost allowance applies to amount deducted for depreciable property for tax purposes.

### **Concentration Ratio (CR4)**

Concentration ratio is a measure of an industry's concentration level and expresses sales of a set number of the top firms in the industry as a percentage of total industry sales. CR4 is the acronym for the concentration ratio of the top four firms in the industry.

### **Constant Prices**

Constant prices refers to a value from which the overall effect of a general price inflation has been removed.

### **Debt to Asset Ratio**

Debt to asset ratio at the farm level is total debt divided by total assets.

### **Debt to Equity Ratio**

Debt to equity ratio at the industry level is borrowings plus loans and accounts with affiliates all divided by total equity. This ratio examines the relationship of debt (loans, bonds, debentures) to shareholders' equity. It compares the relative size of debt to resources invested by the owners. It indicates the extent to which a firm relies on borrowed funds to finance its operations.

### **Farm Expenses**

Farm expenses are estimates of farm operating expenses and represent business costs incurred by farm operators for goods and services used in the production of agricultural commodities. All expense information is on a calendar year basis. If direct rebates are paid to farmers to reduce the cost of particular inputs, then the net expense estimates are used in the preparation of net income, although both gross and net expenses may be displayed. As the objective is to produce provincial estimates of net income, flows from one farm to another are excluded from the estimates. The province can be viewed as one large farm.

### **Farm Family Income**

Farm family income is the sum of the total income of the operator and his/her family members. It includes income from both farm and non-farm sources.

### **Farm Market Receipts**

Farm market receipts refers to cash income from the sale of agricultural commodities, but excludes direct program payments to producers.

## ***Economic and Statistical Terminology (cont'd)***

### **Farm Net Worth**

Farm net worth is measured as the total assets of the farm evaluated at current market value less total liabilities.

### **Foreign Direct Investment (FDI)**

FDI refers to investment by non-residents in an enterprise where the non-residents own 10 percent or more of the ordinary shares or voting power in incorporated enterprises or the equivalent in unincorporated enterprises.

### **Geometric (infinite)**

End-year net stock.

### **Gross Domestic Product (GDP)**

The GDP for a country is the total unduplicated value of the goods and services produced in that country during a given period.

### **Gross Farm Receipts**

Gross farm receipts include cash income from the sale of agricultural commodities and direct program payments. They are compiled from census forms sent to all farms every five years.

### **Gross Margin**

Gross margin is farm revenues minus farm expenses.

### **Gross Margin Ratios**

Gross margin ratios are calculated as the ratio of gross margin earned by a farm relative to its market revenue.

### **Health Check**

The Health Check is a significant “fine tuning” of the 2003 CAP Reform and is expected to put in place further reforms over the years 2009-2013, i.e. to the end of the present budget period.

### **Intramural R&D Expenditures**

Intramural R&D expenditures are all expenditures on research and development that are made by a particular organization in a given time frame and includes work financed by others.

### **Intra-Regional Trade**

Trade between two regions in a given location. For example trade between Canadian provinces.

### **Labour Productivity**

Labour productivity is a measure of an industry's output per hour of labour worked.

### **Multifactor Productivity**

Multifactor productivity measures the efficiency in use of all inputs. Its growth is calculated as the rate of growth of output less the rate of growth of all inputs.

### **Net Cash Income**

Net cash income measures farm business cash flow (farm cash receipts minus operating expenses) generated from the production of agricultural goods. Net cash income represents the amount of money available for debt repayment, investment or withdrawal by the owner

### **Net Operating Income**

Net operating income is a term used at the farm level, and it is the difference between gross farm revenues and total farm cash expenses.

## **Economic and Statistical Terminology (cont'd)**

### **Net Value-Added**

Net value-added measures agriculture's contribution to the national economy's production of goods and services created in a particular year. It is derived by calculating the total value of agricultural sector production, including program payments, and subtracting the related costs of production (expenses on inputs, business taxes and depreciation). Net value added is distributed to the various factors of production, including rent to non-operator landlords, interest to lenders, wages and profits.

### **Net Worth**

Net worth corresponds to total assets minus total liabilities of the farm.

### **Off-Farm Income**

The term off-farm income is a bit misleading in that it includes wages and salaries paid to family members for work done on the farm. On average, for Canada, wages and salaries earned on the farm account for 22% of total wages and salaries earned for a farm family operating an unincorporated farm. The percentage varies by farm type and province.

### **Operating Margin**

This is operating revenue minus operating expenses.

### **Permanent Cropland**

FAO defines *permanent cropland* as land cultivated with crops that occupy the land for long periods and need not be replanted after each harvest (e.g. cocoa, coffee, and rubber) For Canada, *permanent cropland* is equal to area on farms that is covered with forest and woodland.

### **Profit Margin Ratio**

Profit margin ratio at the industry level is calculated as operating profits divided by total operating revenues. Operating profit is the net result of the principal business activities of a firm. It is calculated before taking into account interest expense, investment income, non-recurring losses from the write-down of assets, gains or losses realized on the disposal of assets, and income tax expense. This ratio indicates management's ability to generate earnings from the principal business activities of a firm.

### **Quintiles**

Quintiles are ranking households in ascending order of total household income and organized into five groups of equal numbers.

### **Rate of Return on Long-term Capital**

The rate of return on long-term capital is calculated as operating income (without deducting either taxes or interest paid) divided by long-term capital where long-term capital is taken to be the sum of shareholders' equity and long-term debt.

### **Realized Net Farm Income**

Realized net farm income is calculated as realized net market income plus government program payments.

### **Realized Net Market Income**

Realized net market income is calculated as farm market receipts plus income-in-kind less operating expenses and depreciation.

### **Return on Assets**

The rate of return on assets at the farm level is calculated as net operating income plus interest expense minus capital cost allowance divided by the total value of assets at cost. In the case of dairy and poultry farms the Allowance on Eligible Capital Property (ECE) for quota was also deducted.

## ***Economic and Statistical Terminology (cont'd)***

### **Return on Equity**

The rate of return on equity at the farm level is calculated as net operating income minus capital cost allowance divided by net worth at cost. In the case of dairy and poultry farms the Allowance on Eligible Capital Property (ECE) for quota was also deducted.

### **Return on Equity Ratio**

Return on equity ratio at the industry level is calculated as after-tax profit divided by total equity x 100. This ratio measures the level of return to the owners (investors) and it represents their measure of profitability. The earnings figure is the after-tax profits, including a deduction for interest expense (payments to lenders) It is the net profit available to the owners (investors). The ratio indicates how many cents are returned to every dollar invested by the owners.

### **Total Actual Renewable Water Resources (TARWR)**

TARWR is an index developed by the Food and Agriculture Organization (FAO) of the United Nations and reflects the water resources theoretically available for development from all sources within a country. According to this index, there are more than 55 thousand cubic kilometers of TARWR per year in the earth. However, due to the mismatch between distribution of water resources and populations on wide geographic areas, and the seasonal variations in stock of water resource, only a fraction of these resources was withdrawn for various purposes. On average, world withdrew only about 7 per cent of TARWR per year between the period of 1998-2002. Globally, approximately 70 per cent of water withdrawal is for agriculture.

### **Total Factor Productivity (TFP)**

TFP is measured as output divided by all inputs (i.e. capital, labour etc.).

### **Value-Added Production**

Value-added production refers to products that have undergone some processing.



## **Data Sources and References**

## Data Sources and References

### Chart Source

## Section A Special Features

### Section A1: Global Food Price Inflation

|             |   |
|-------------|---|
| A1.1        | International Monetary Fund (IMF)<br>( <a href="http://www.imf.org/external/np/res/commod/externaldata.csv">http://www.imf.org/external/np/res/commod/externaldata.csv</a> )  |
| A1.2 & A1.3 | OECD, USDA, AAFC calculations   |
| A1.4        | U.S. Census Bureau<br>( <a href="http://www.census.gov/ipc/www/idb/worldpop.html">http://www.census.gov/ipc/www/idb/worldpop.html</a> )   |
| A1.5        | OECD  |
| A1.6        | International Food Policy Research Institute<br>( <a href="http://www.ifpri.org/pubs/fpr/pr18.pdf">http://www.ifpri.org/pubs/fpr/pr18.pdf</a> )   |
| A1.7        | Energy Information Administration<br>( <a href="http://www.eia.doe.gov/pub/international/iealf/tablee1.xls">http://www.eia.doe.gov/pub/international/iealf/tablee1.xls</a> )  |
| A1.8        | IMF, Renewable Fuels Association Annual Industry Outlook (various years)<br>( <a href="http://www.imf.org/external/np/res/commod/externaldata.csv">http://www.imf.org/external/np/res/commod/externaldata.csv</a> ; <a href="http://www.ethanolrfa.org/industry/outlook/">http://www.ethanolrfa.org/industry/outlook/</a> )   |
| A1.9        | Natural Resources Canada and Ridgetown College, University of Guelph  |
| A1.10       | Australian Bureau of Agricultural and Resource Economics, OECD  |
| A1.11       | OECD  |
| A1.12       | Bank of Canada; Statistics Canada; CANSIM Table 326-00211- Consumer price index (CPI), 2005 basket, Annual (2002=100); IMF<br>( <a href="http://www.bankofcanada.ca/en/rates/exchange_avg_pdf.html">http://www.bankofcanada.ca/en/rates/exchange_avg_pdf.html</a> ; <a href="http://www.imf.org/external/np/res/commod/externaldata.csv">http://www.imf.org/external/np/res/commod/externaldata.csv</a> ) |
| A1.13       | Statistics Canada<br>( <a href="http://www.statcan.ca/english/freepub/62-001-XIE/2008007/t033_en.htm">http://www.statcan.ca/english/freepub/62-001-XIE/2008007/t033_en.htm</a> )  |
| A1.14       | Statistics Canada and AAFC calculations<br>CANSIM Table 326-00211 - Consumer price index (CPI), 2005 basket, Annual (2002=100)  |
| A1.15       | OECD; National Bureau of Statistics of China  |
| A1.16       | OECD  |
| A1.17       | IFPRI and AAFC calculations<br>( <a href="http://www.ifpri.org/2020/dp/vp43.asp">http://www.ifpri.org/2020/dp/vp43.asp</a> )  |

## Section B The Agriculture and Agri-Food System and the Canadian Economy

### Section B1: GDP and Employment

|           |  |
|-----------|--|
| B1.1-B1.4 | CANSIM Table 379-0017 - Gross Domestic Product (GDP) at basic prices by North American Industry Classification System (NAICS), annual *T*<br>CANSIM Table 301-0003 - Annual Survey of Manufactures *T* |
|-----------|--|

## Data Sources and References (cont'd)

| Chart       | Source  |
|-------------|---|
| B1.5 & B1.6 | CANSIM Table 301-0006 - Annual Survey of Manufactures and Logging<br>Statistics Canada, CANSIM Table 379-0025 - Gross Domestic Product (GDP) at basic prices by North American Industry Classification System (NAICS) and province, annual and special tabulations for AAFC<br>Data for P.E.I and N.B. GDP are estimation based on the shares of AAFC GDP of provincial GDP, based on GDP data provided by the Conference Board |
| B1.7 & B1.8 | Statistics Canada, Labour Force Survey special tabulation for AAFC  |

### Section B2: International Trade

|              |   |
|--------------|---|
| B2.1         | Global Trade Atlas and AAFC calculations  |
| B2.2         | Bank of Canada<br>( <a href="http://www.bankofcanada.ca/en/rates/cei-lookup.html">http://www.bankofcanada.ca/en/rates/cei-lookup.html</a> ) |
| B2.3 & B2.4  | Statistics Canada and AAFC calculations<br>(Canadian International Merchandise Trade Database via Canadian Agri-Food Trade System)          |
| B2.5         | Global Trade Atlas and AAFC calculations  |
| B2.6         | Statistics Canada and AAFC calculations<br>(Canadian International Merchandise Trade Database)  |
| B2.7 & B2.8  | Global Trade Atlas and AAFC calculations  |
| B2.9 & B2.10 | Statistics Canada and AAFC calculations<br>(Canadian International Merchandise Trade Database)  |
| B2.11        | Global Trade Atlas and AAFC calculations  |
| B2.12        | Statistics Canada and AAFC calculations<br>(Canadian International Merchandise Trade Database via Canadian Agri-Food Trade System)          |
| B2.13-B2.18  | Global Trade Atlas and AAFC calculations  |

### Section B3: Productivity, R&D and Innovation

|      |   |
|------|---|
| B3.1 | Statistics Canada<br>CANSIM Table 383-0022: Multifactor productivity, gross output, value-added, capital, labour and intermediate inputs at a detailed industry level, by North American Industry Classification System (NAICS)<br>United States Department of Agriculture (Economic Research Service) Table 1 Indices of farm output, input, and total factor productivity for the United States 1948-2004 (excel file table01.xls from web page <a href="http://www.ers.usda.gov/Data/AgProductivity">http://www.ers.usda.gov/Data/AgProductivity</a> ) |
| B3.2 | Statistics Canada<br>CANSIM Table 383-0022: Multifactor productivity, gross output, value-added, capital, labour and intermediate inputs at a detailed industry level, by North American Industry Classification System (NAICS)   |



**Data Sources and References (cont'd)**

| <b>Chart</b> | <b>Source</b>   |
|--------------|---|
| B3.3         | <p>Statistics Canada</p> <p>CANSIM Table 383-0022: Multifactor productivity, gross output, value-added, capital, labour and intermediate inputs at a detailed industry level, by North American Industry Classification System (NAICS)</p> <p>United States Bureau of Labor Statistics, 1987-2006 Aggregate Manufacturing and Manufacturing Industries KLEMS Multifactor Productivity Tables, (excel file klems_mfp_1987_to_2006.xls from web page <a href="http://www.bls.gov/mfp/mprdload.htm">http://www.bls.gov/mfp/mprdload.htm</a>)</p>   |
| B3.4         | Sustainable Development Technologies Canada (SDTC) ( <a href="http://www.sdte.ca/en/about/innovation_chain.htm">http://www.sdte.ca/en/about/innovation_chain.htm</a> )  |
| B3.5 & B3.6  | Statistics Canada, Survey of Innovation 2005  |
| B3.7         | Statistics Canada, Service Bulletin, Science Statistics, "Industrial Research and Development, 2003 to 2007", November 2007. Catalogue 88-001-X.  |
| B3.8         | <p>Statistics Canada, Service Bulletin, Science Statistics, "Industrial Research and Development, 2003 to 2007", November 2007. Catalogue 88-001-X.</p> <p>Statistics Canada, CANSIM, Table 379-0023 - Gross Domestic Product (GDP) at basic price in current dollars, system of national accounts benchmark values by North American Industry Classification System (NAICS), Annual</p>  |
| B3.9 & B3.10 | Agriculture and Agri-Food Canada, Farm Income, Financial Conditions and Government Assistance Databook  |
| B3.11        | OECD, Agricultural Policies in OECD Countries: At a Glance, 2008  |
| B3.12        | Calculated by authors based on Agricultural Science and Technology Indicators (ASTI) initiative data; Pardey and Beintema (2001); RICYT (2005); Casas, Solh, and Hafez (1999); OECD (2005); Eurostat (2005); and USDA/CRIS (2006)   |
| B3.13        | <p>Galushko, Viktoriya, &amp; Gray, Richard. (2008) Benefits from wheat breeding research in Western Canada. CAIRN Working Paper. University of Saskatchewan.</p> <p>Scott T., Guzel, A., Furtan, H., &amp; Gray, R. (2005). Returns to research, Western Grains Research Foundation, wheat and barley check-offs.</p> <p>Goddard, Ellen, Benkie, James, and Boyd, Curtis. 2008. Impact of ACIDF Fund 2001. Presented at the ACIDF Annual General Meeting, June 10.</p> <p>Boyd, Curtis, Goddard, Ellen, and Benkie, James. (2008) An Assessment of returns to research in field peas and canola. CAES Selected Paper, presented at the CAES meetings, June 30, 2008.</p> |
| B3.14        | Galushko, Viktoriya and R. Gray, <i>Benefits from Wheat Breeding Research in Western Canada</i> , forthcoming CAIRN Working paper. 2008   |
| B3.15-B3.18  | Statistics Canada, Bioproducts Development and Production Survey 2006   |

## Data Sources and References (cont'd)

### Chart

### Source

## Section C Components of the Agriculture and Agri-Food System

### Section C1: Consumers

|               |  |
|---------------|--|
| C1.1 & C1.2   | Statistics Canada, CANSIM, Table 380-0024 - Personal expenditure on goods and services, Annual   |
| C1.3          | Statistics Canada, CANSIM Table 380-0019, Sector Accounts, Persons and Unincorporated Businesses, Annual<br>CANSIM Table 051-0001, Estimates of Population, Annual |
| C1.4          | Statistics Canada, Spending Patterns in Canada, 2006, Catalogue no. 62-202-X   |
| C1.5          | Statistics Canada, CANSIM Table 202-0405, Upper Income limits and income shares of total income quintiles, by economic family type, 2006 constant dollars, Annual  |
| C1.6 & C1.7   | Statistics Canada, CANSIM Table 380-0024 Personal expenditure on goods and services, Annual  |
| C1.8          | Canadian Restaurant and Foodservices Association<br>(Sourced from Eating Patterns in Canada Report 2005, NPD Group Canada Inc.)                                    |
| C1.9          | Statistics Canada, CANSIM Table 203-002, Household Spending on Food by Province and Territory, Annual  |
| C1.10 & C1.11 | Canadian Federation of Agriculture and Meyers Norris Penny, CFA Canadian Label Project: Branding Canada at Home Final Report. June 18, 2007                        |

### Section C2: Food Distribution (Retail/Wholesale and Foodservice)

|      |   |
|------|---|
| C2.1 | Canadian Grocer, Statistics Canada, and AAFC calculations<br>(Canadian Grocer, Feb 2008; CANSIM Table 355-0006 - Monthly survey of food services and drinking places, by North American Industry Classification System (NAICS), computed annual average)  |
| C2.2 | Canadian Grocer, Statistics Canada, and AAFC calculations   |
| C2.3 | Statistics Canada, Quarterly Financial Statistics for Enterprises<br>CANSIM Table 187-0001 - Quarterly balance sheet and income statement, by North American Industry Classification System (NAICS);<br>CANSIM Table 187-0002 - Quarterly statement of changes in financial position, by North American Industry Classification System (NAICS), selected financial ratios and selected seasonally adjusted components |
| C2.4 | Statistics Canada, Quarterly Retail Commodity Survey, Special Tabulation  |
| C2.5 | A.C. Nielsen.   |
| C2.6 | Statistics Canada<br>CANSIM Table 355-0006 - Monthly survey of food services and drinking places, by North American Industry Classification System (NAICS)  |
| C2.7 | Canadian Restaurant and Foodservices Association, Quarterly InfoStats<br>( <a href="http://www.crfa.ca/research/2008/foodservice_bankruptcies_at_27-year_low.asp">http://www.crfa.ca/research/2008/foodservice_bankruptcies_at_27-year_low.asp</a> )  |

## Data Sources and References (cont'd)

| Chart | Source  |
|-------|---|
| C2.8  | Canadian Restaurant and Foodservices Association<br>( <a href="http://www.crfa.ca/research/2005/top_50_chains_capture_over_half_market_share.asp">http://www.crfa.ca/research/2005/top_50_chains_capture_over_half_market_share.asp</a> ) |
| C2.9  | Canadian Restaurant and Foodservices Association and AAFC calculations<br>( <a href="http://www.crfa.ca/research/statistics/sales_07-06.asp">http://www.crfa.ca/research/statistics/sales_07-06.asp</a> )                                 |
| C2.10 | Statistics Canada, Financial and Taxation Statistics for Enterprises, Annual<br>CANSIM Table 180-0003 - Financial and taxation statistics for enterprises, by North American Industry Classification System (NAICS), Annual               |

### Section C3: Food, Beverage and Tobacco (FBT) Processing

|               |   |
|---------------|---|
| C3.1          | Statistics Canada, Input/Output Model 2004 and AAFC calculations  |
| C3.2          | Statistics Canada, CANSIM Table 379-0017 - Gross Domestic Product (GDP), at basic price by North American Industry Classification System (NAICS), Annual  |
| C3.3          | Statistics Canada, CANSIM Table 281-0024 - Employment (SEPH), unadjusted for seasonal variation, by type of employee for selected industries classified using the North American Industry Classification System (NAICS), Annual   |
| C3.4-C3.5     | Statistics Canada, CANSIM Table 304-0014 - Manufacturers' shipments, inventories, orders and inventory to shipment ratios, by North American Industry Classification System (NAICS), Canada, Monthly  |
| C3.6 & C3.7   | Statistics Canada, special tabulations from Annual Survey of Manufactures and Logging   |
| C3.8 & C3.9   | Canadian International Merchandise Trade Database via <a href="http://strategis.gc.ca">strategis.gc.ca</a><br>Statistics Canada, Monthly Survey of Manufactures, special tabulation for AAFC  |
| C3.10         | Statistics Canada, CANSIM Table 301-0006 - Principal statistics for manufacturing industries, by North American Industry Classification System (NAICS), Annual (dollars x 1,000)  |
| C3.11         | Statistics Canada and U.S. Bureau of Labor Statistics<br>CANSIM Table 176-0064 - Foreign exchange rates in Canadian dollars, computed annual average<br><a href="ftp://ftp.bls.gov/pub/special.requests/ForeignLabor/ind3112naics.txt">ftp://ftp.bls.gov/pub/special.requests/ForeignLabor/ind3112naics.txt</a> |
| C3.12         | Statistics Canada, special tabulation from Quarterly Survey of Financial Statistics for Enterprises   |
| C3.13         | AAFC, "Corporate Income Tax Rate Database: Canada and the Provinces, 1960-2007" via AAFC web page   |
| C3.14 & C3.15 | Statistics Canada, special tabulation from Quarterly Survey of Financial Statistics for Enterprises   |
| C3.16         | Statistics Canada, CANSIM Table 031-0002 - Flows and stocks of fixed non-residential capital, by North American Industry Classification System (NAICS), Annual (dollars)  |

## Data Sources and References (cont'd)

| Chart       | Source  |
|-------------|---|
| C3.17-C3.19 | Statistics Canada<br>Table 376-0052 - International investment position, Canadian direct investment abroad and foreign direct investment in Canada, by North American Industry Classification System (NAICS) and region, Annual (dollars) |

### Section C4: Primary Agriculture

|               |  |
|---------------|--|
| C4.1          | Statistics Canada Input/Output Model and AAFC calculations   |
| C4.2 & C4.3   | Statistics Canada, 2006 Census of Agriculture, Labour Force Survey, Monthly CANSIM, Table 282-0007 - Labour force survey estimates   |
| C4.4 & C4.5   | Statistics Canada, Farm Cash Receipts<br>CANSIM, Table 002-0001  |
| C4.6          | Statistics Canada and AAFC calculations  |
| C4.7          | Statistics Canada, OECD and AAFC calculations  |
| C4.8          | IMF Primary Commodity Database<br>( <a href="http://www.imf.org/external/np/res/commod/externaldata.csv">http://www.imf.org/external/np/res/commod/externaldata.csv</a> )  |
| C4.9          | Statistics Canada<br>CANSIM Table 002-0022 - Farm product price index (FPPI), annual (index, 1997=100)   |
| C4.10-C4.11   | Statistics Canada, Farm Cash Receipts<br>CANSIM, Table 002-0001  |
| C4.12-C4.15   | Statistics Canada and AAFC calculations<br><a href="http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1202760466112&amp;lang=0">http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1202760466112&amp;lang=0</a> |
| C4.16 & C4.17 | Statistics Canada, Census of Agriculture, various years  |
| C4.18         | Statistics Canada, 2006 Census of Agriculture  |
| C4.19-C4.25   | Statistics Canada and AAFC calculations<br><a href="http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1202760466112&amp;lang=0">http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1202760466112&amp;lang=0</a> |
| C4.26-C4.27   | Statistics Canada and AAFC, 2007 Farm Financial Survey   |
| C4.28         | Statistics Canada and AAFC, 2006 Farm Financial Survey   |
| C4.29         | AAFC, 2007 National Renewal Survey   |
| C4.30         | Statistics Canada and AAFC, 2007 Farm Financial Survey   |
| C4.31 & C4.32 | Statistics Canada and AAFC, Farm Financial Survey, various years   |
| C4.33         | Statistics Canada and AAFC, 2007 Farm Financial Survey   |
| C4.34 & C4.35 | Statistics Canada and AAFC, Farm Financial Survey, various years   |
| C4.36         | Statistics Canada and AAFC, 2007 Farm Financial Survey   |
| C4.37 & C4.38 | Statistics Canada and AAFC, 2007 Farm Financial Survey   |
| C4.39-C4.41   | Statistics Canada, Corporate Taxfiler Database, various years  |

## Data Sources and References (cont'd)

### Chart

### Source

#### Section C5: Agricultural Input and Service Suppliers

|      |   |
|------|---|
| C5.1 | Agriculture and Agri-Food Canada (AAFC)   |
| C5.2 | Statistics Canada<br>CANSIM Table 002-0022 - Farm product price index (FPPI), annual (index, 1997=100)<br>CANSIM Table 328-0014 - Farm input price index, annual (index, 1992=100);<br>Table 328-0001 - Farm input price index, quarterly (index, 1986=100) |
| C5.3 | Statistics Canada<br>CANSIM Table 002-0005 - Farm operating expenses and depreciation charges, annual (dollars)   |
| C5.4 | Statistics Canada and AAFC calculations<br>CANSIM Table 002-0005 - Farm operating expenses and depreciation charges, annual (dollars)<br>CANSIM Table 328-0014 - Farm input price index, annual (index, 1992=100)   |
| C5.5 | Statistics Canada<br>CANSIM Table 002-0005 - Farm operating expenses and depreciation charges, annual (dollars)   |
| C5.6 | Co-operatives Secretariat, AAFC and Statistics Canada; Cooperatives Secretariat, General Publications "Profile of Canadian Agricultural Co-operatives" various issues   |
| C5.7 | Co-operatives Secretariat, AAFC   |

#### Section C6: Natural Resource Use and Environmental Impacts

|              |   |
|--------------|---|
| C6.1         | Food and Agriculture Organization of the United Nations (FAO). FAOSTAT Online Statistical Service. Rome<br>( <a href="http://faostat.fao.org">http://faostat.fao.org</a> )  |
| C6.2         | United Nations, Demographic Yearbook 2005<br>Food and Agriculture Organization of the United Nations (FAO). FAOSTAT Online Statistical Service. Rome<br>( <a href="http://faostat.fao.org">http://faostat.fao.org</a> ) |
| C6.3         | Natural Resources Canada, Canada's Forest Inventory. CanFi 2001   |
| C6.4         | Census of Agriculture, 2006, Farm data and farm operator data tables  |
| C6.5-C6.8    | Food and Agriculture Organization of the United Nations (FAO). AQUASTAT database  |
| C6.9 & C6.10 | Canadian Regional Agriculture Water Use Model (CRAWUM), AAFC  |
| C6.11-C6.13  | Census of Agriculture, 2006.  |
| C6.14        | McConkey, B.G., Lobb, D.A., Li, S., and Black, J.M.W. (forthcoming) 2009. Risk of Erosion. Agri-Environmental Indicator Report Series, Report #3, AAFC  |
| C6.15        | Census of Agriculture, 2006. Farm data and farm operator data tables  |
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## Data Sources and References (cont'd)

| Chart | Source   |
|-------|--|
| C6.17 | De Jong, R., Drury, C.F., and Yang, J.Y. (forthcoming) 2009. Indicator of the Risk of Water Contamination by Nitrogen (IROWC-N). Agri-Environmental Indicator Report Series, Report #3, AAFC |
| C6.18 | Canadian Economic and Emissions Model for Agriculture (CEEMA), AAFC  |

## Section D Government and the Agriculture and Agri-Food Sector

### Section D1: Government Expenditures in Canada

|             |   |
|-------------|---|
| D1.1 - D1.8 | Agriculture and Agri-Food Canada (AAFC); Farm Income, Financial Conditions and Government Assistance - Databook, Table C.1 (April 2008 update)            |
| D1.9        | Statistics Canada<br>Table 031-0002 - Flows and stocks of fixed non-residential capital, by North American Industry Classification System (NAICS), Annual |
| D1.10       | AAFC calculations<br>Table 031-0002 - Flows and stocks of fixed non-residential capital, by North American Industry Classification System (NAICS), Annual |

### Section D2: Producer Support Estimates (PSE) and Agricultural Policies in Canada and Other Countries

|           |   |
|-----------|---|
| D2.1      | OECD, Trade and Agriculture Directorate, Producer and Consumer Support Estimates, OECD Database 1986-2007 |
| D2.2-D2.4 | OECD, Agriculture Policies in OECD Countries: At a Glance 2008  |

