



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada

REPORT ON
*Long Term Challenges and Opportunities
for Future Competitiveness and Prosperity
of the Agriculture and Agri-Food Industry*

CHAPTER 2:
*Structure and Performance of the
Canadian Food Processing Industry*

January 2007

Canada

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Acknowledgement

This report is the outcome of a collaborative effort by members of the Federal/Provincial/Territorial (FPT) Working Group on Economic Analysis, who were tasked by FPT ADM's to provide economic analysis.

F/P/T WORKING GROUP ON ECONOMIC ANALYSIS:

Co-chairs

Joe Rosario, Alberta Agriculture and Food

Tulay Yildirim, Agriculture and Agri-Food Canada (AAFC)

Members of the Working Group

Shiferaw Adilu, Alberta

Mario Beaulieu, Quebec

Peter Blawat, Manitoba

John Colford, Northwest Territories

John Cumming, Ontario

Ron Eley, Saskatchewan

Zahoor Haq, Ontario

Tony Hill, Yukon

Darryl Houlihan, Newfoundland and Labrador

Anna Ilnyckyj, Ontario

Jennifer Kidon, Ontario

Peter Leitz, British Columbia

Kathleen MacDonald-Date, British Columbia

George MacIntosh, Nova Scotia

George Maicher, New Brunswick

Diane McGuire, British Columbia

Syed Naqvi, Ontario

Dena Parsons, Newfoundland and Labrador

Hearon Persad, Northwest Territories

Anna Scott, Ontario

Sylvio Soucy, Quebec

Shirley Stuible, New Brunswick

AAFC Project Team

Samuel Bonti-Ankomah

Dave Culver

Lambert Gauthier

Nasreen Islam

Charlene Saunders

Tracey Shorey

Julie Smith

Stephen Smith

Margaret Zafiriou

Foreword

- This report is the second chapter on a report prepared by the Federal/Provincial/Territorial (FPT) Working Group (WG) on Economic Analysis at the request of FPT Assistant Deputy Ministers (ADMs) in an effort to study the challenges and opportunities that are arising from the trends and factors affecting the sector's long term prosperity and competitiveness.
- The report is a compilation of data and information that presents a snapshot of the state of the industry and the challenges and opportunities facing the sector. It is by no means a comprehensive analysis of the industry or a policy paper.
- This report is based on the progress report the WG presented to ADMs in November 2005 and published in February 2006 on AAFC online. This chapter provides additional data and information related to the structure and performance of the food processing sector and provides updates wherever possible.



Executive summary

- The food processing industry contributes significantly to the growth in the agriculture and agri-food supply chain and the economy.
- The food processing industry faces significant challenges and opportunities from technological change, changing market and consumer requirements, the emergence of low cost competitors, labour shortages, an appreciating Canadian dollar, higher energy prices and developments in other parts of the supply chain, niche markets and the growing food demand in developing countries.
- To adjust to the challenges, the industry has undergone significant structural change since the early 1990s, becoming increasingly concentrated and export oriented.
- The restructuring has allowed profit margins in food processing to remain stable, but below those in total manufacturing.
- Profit margins are, however, continuously challenged by rising costs such as for materials and supplies, labour and rising energy prices.
- The future prosperity and competitiveness of the food processing industry will depend on its continuing ability to adjust to the changing global environment by, among other things, increasing its cost competitiveness through productivity improvements and becoming more competitive in export markets.
- Productivity improvements depend on investments in R&D, innovation and public infrastructure, removal of regulatory impediments and improvement in the skills of the labour force. In addition, the industry must ensure the delivery of differentiated products that meet the new demands of consumers and emerging market requirements.
- Investments in R&D and innovation in Canadian food processing are comparable to those in other manufacturing industries but are behind those in other countries.

Section A

Food Processing Industry Structure



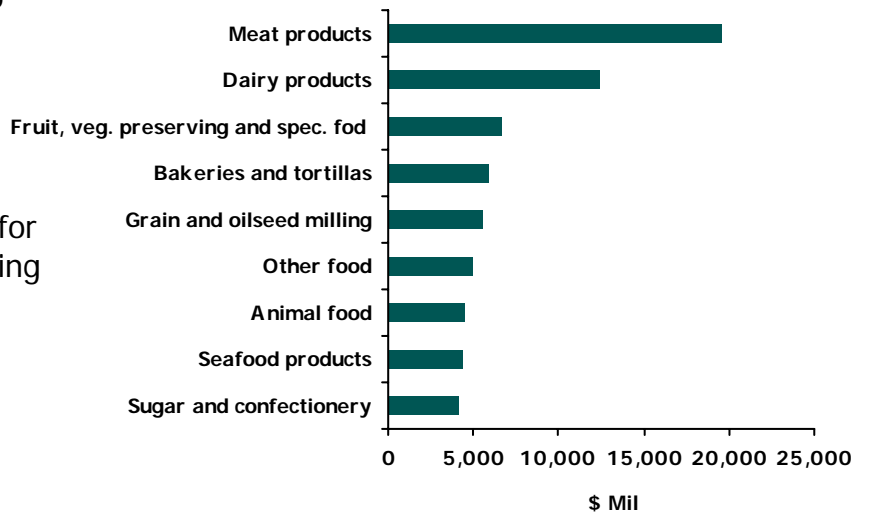
Summary

- Food processing is the second largest manufacturing industry in Canada that contributes significantly to the growth in the agricultural sector and other segments of the agri-food supply chain and the economy.
- Like primary agriculture, food processing faces significant challenges and opportunities from global markets, such as technological change, changing market requirements, the emergence of low cost competitors, a growing concern for increased health and safety of food products, labour shortages, an appreciating Canadian dollar, higher energy prices, and developments in other parts of the chain, niche markets and growing food demand in developing countries.
- The Canadian food processing industry has undergone significant structural change since the early 1990s, becoming increasingly consolidated, concentrated and export oriented, and has managed to maintain its profitability.
- It has become increasingly integrated across supply chains throughout North America and around the globe.
- Globalization and freer trade have been major factors driving this change as the food processing industry has become increasingly export oriented and competitive in many areas.
- However, challenges will continue to put pressure on the industry, such as an appreciating Canadian dollar, increased competition from emerging low cost developing countries, increasing imports and risks to input supplies.

Food processing includes everything from meat products processing to animal food processing

- Food processing includes those manufacturing industries that transform agricultural products to processed food products.
- Meat products processing and dairy product processing are the most prevalent food processing industries in Canada, accounting for almost 50% of total food processing shipments.

Chart 1
Food processing industry shipments, by industry, Canada (2005)



Source: Statistics Canada, Monthly Survey of Manufacturing.

- Many food processing companies in Canada are subsidiaries or branches of large multi-nationals (MNEs) which dominate the world food industry, such as Nestle’s and Kraft.

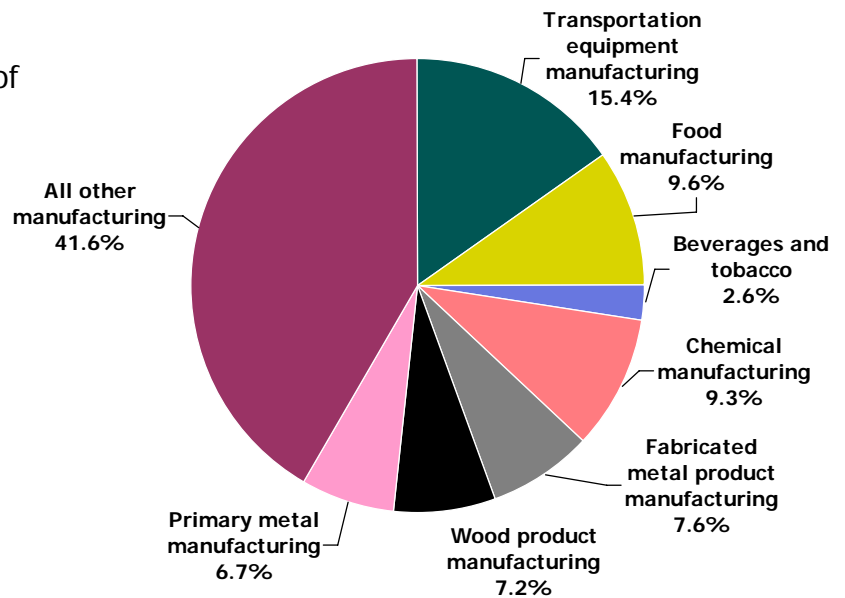
Chart 2
Major players in the Canadian food processing industry

MAJOR PLAYERS	
Meat processing	Maple Leaf Foods, Olymel, Tyson Foods, Cargill Foods, Smithfield Foods, Lakeside Packers, Quality Meat Packers, XL Beef
Dairy product processing	Saputo, Astro, Agropur, Parmalat, Danone Group, Kraft, Gay Lea Cooperative, Chapmans
Poultry processing	Olymel, Lilydale Poultry Cooperative, Exeldor, Maple Leaf Poultry, Cooperative Federee de Quebec, Maple Lodge Farms
Grain and oilseed milling	Cargill, Archer Daniel Midlands, ConAgra Foods, Bunge, Agricore United, Saskatchewan Pool
Cereal and bakery products	General Mills, Kraft (Nabisco, Christie), Kellogg, Maple Leaf Foods, Westons, Smucker (Robin Hood)
Potato processing	McCains, Cavendish, Simplot
Sugar processing and confectionery	Lantic (Roger’s), Redpath, Hershey, Mars, Cadbury, Schweppes, Wrigley’s
Other	Unilever, Frito-Lay, Heinz

Food processing is the second largest manufacturing industry in Canada

- Food processing was a \$69 billion industry in Canada in 2005 as measured by shipments.
- The industry accounted for 9.6% of total manufacturing GDP and 12% of shipments. It also accounted for 1.7% of total Canadian GDP.

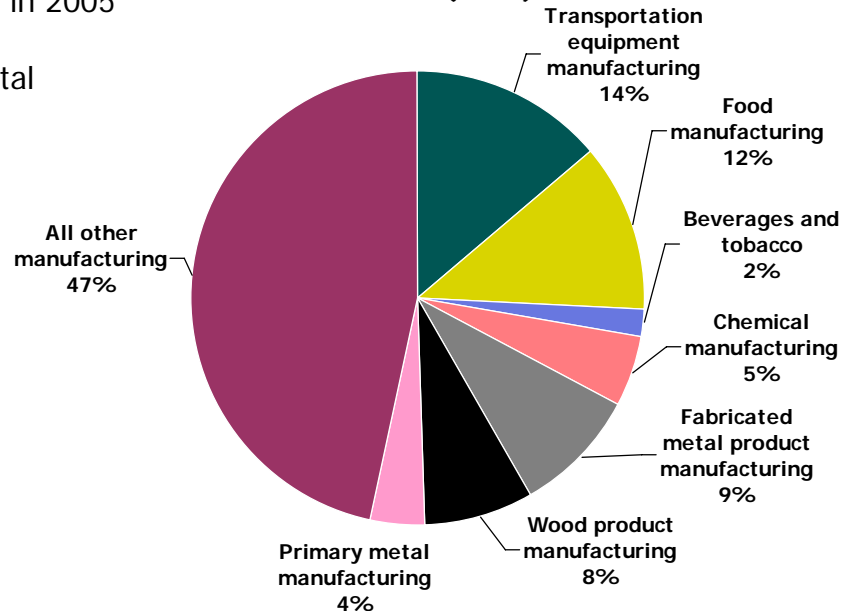
Chart 3
Contribution of food processing to total manufacturing GDP (2005)



Source: Statistics Canada and AAFC calculations.

- In terms of employment, food processing was the second largest manufacturing employer with 268,000 employees in 2005 out of 2.2 million or 12% in total manufacturing and 1.7% of the total economy.

Chart 4
Contribution of food processing to total manufacturing employment (2005)



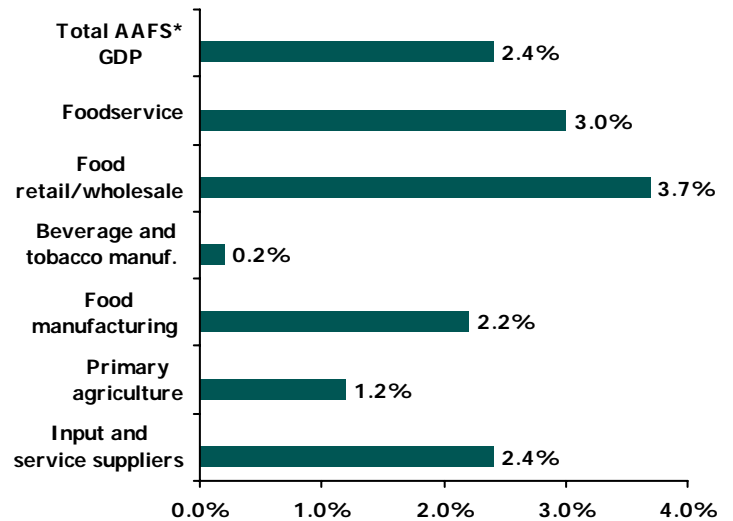
Source: Statistics Canada and AAFC calculations.

Growth in food processing is important for the growth in the primary agriculture sector as well as for the agri-food supply chain

- The food manufacturing industry has grown at a rate of 2.2% per year on average since 1991. This is faster than primary agriculture (1.2%) but slower than food service (3.0%) and food retail (3.7%).
- Growth in food manufacturing is vital for the growth in the primary sector since 43% of agricultural production is utilized by the food manufacturing sector according to analysis from Statistics Canada's input-output model.
- The output from the food processing industry is a major input into food retailing and the food service industry as well as a source of food products for export markets.

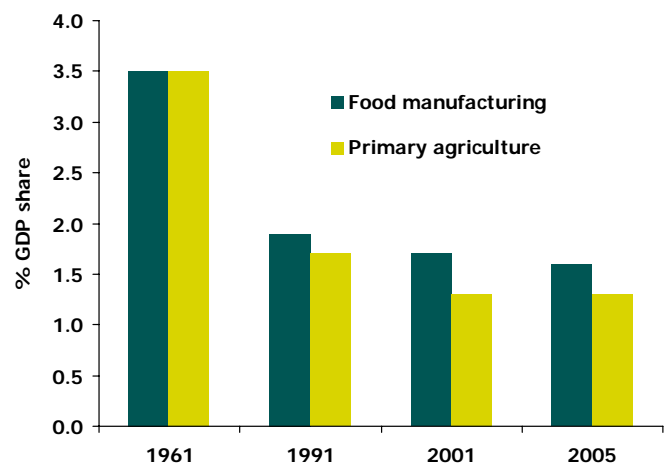
- While GDP in the food processing industry has grown over time, its share in total GDP has declined.
- Like agriculture, the share of food processing GDP to total GDP has declined from 3.5% to 1.6% between 1961 and 2005 as other sectors have grown more significantly.

Chart 5
Average annual percentage change in GDP (1991-2004)



*Agriculture and agri-food system.
Source: Statistics Canada and AAFC calculations.

Chart 6
Share of food manufacturing GDP in total GDP (1961, 1991, 2001 and 2005)



Source: Statistics Canada and AAFC calculations.

Growth in the food processing industry impacts the Canadian economy as a whole

- For every \$1 of direct GDP created in the food processing industry, another \$1.78 of GDP is indirectly created in the economy. Similarly for every job created by this activity, another 2.44 jobs are indirectly created. The food processing industry's contribution to economic growth is more significant than that of other industries.

Chart 7
Relative importance of different industries to the economy*

For every \$1 of GDP created in: Industry	Impacts on GDP and employment	
	Ratio of indirect-to-direct GDP	Ratio of indirect-to-direct employment
Primary agriculture	1.54	0.83
Total food processing	1.78	2.44
- Animal slaughtering	4.82	6.30
- Flour milling	1.72	4.61
- Dairy processing	2.45	3.36
Beverage and tobacco	0.78	1.55
Chemical manufacturing	1.17	1.44
Primary metal manufacturing	1.36	1.54
Transportation equipment	1.02	1.27
Fabricated metal	0.68	0.63

* The direct effect on GDP or employment is the impact created within the industry when a shock occurs, while the indirect effects refer to the GDP and employment created in other sectors of the economy.

- Thus, strong growth in the food processing industry will contribute to strong growth in the Canadian economy.

Increases in production in the food processing industry are responsible for increases in GDP and employment up and down the supply chain

- A \$1 increase in production in the food processing industry is accompanied by a \$0.12 increase in primary agriculture GDP.
- On the other hand for every \$1 increase in food processing there is an increase of only \$0.04 and \$0.01 in wholesale and retail GDP respectively.

Chart 8
Importance of food processing industry to economic growth

UPSTREAM AND DOWNSTREAM IMPACTS OF \$1 INCREASE IN PRODUCTION IN FOOD PROCESSING	
INDUSTRY	GDP CHANGE (\$)
Food processing	0.26
Primary agriculture	0.12
Other manufacturing	0.10
Wholesale	0.04
Retail	0.01
Transportation and warehousing	0.03
Rest of economy	0.17

Source: Statistics Canada, Input-Output Model.

- For any increase in employment in food processing, there is a corresponding gain in employment in primary agriculture, but relatively smaller increases in other sectors of the supply chain.

Chart 9
Importance of food processing industry to total employment

IMPACTS OF A 1% INCREASE IN FOOD PROCESSING EMPLOYMENT	
INDUSTRY	% CHANGE IN EMPLOYMENT
Primary agriculture	0.97
Other manufacturing	0.35
Wholesale	0.19
Retail	0.07
Transportation and warehousing	0.14
Rest of economy	0.72

Source: Statistics Canada, Input-Output Model.

- Thus, any policies that impact on food processing employment will have almost an equal impact on employment in primary agriculture.

Food processing sub-industries closer to primary agriculture in the supply chain have more of an impact on primary agriculture GDP changes that result

- For example, for every \$1 increase in production in animal slaughtering, GDP increases by \$0.34 in primary agriculture and \$0.18 in total food processing.

Chart 10
Importance of food processing sub-industries to economic growth

UPSTREAM AND DOWNSTREAM IMPACTS OF \$1 INCREASE IN PRODUCTION IN FOOD PROCESSING SUB-INDUSTRIES ON GDP				
INDUSTRY	ANIMAL SLAUGHTERING	RENDERING AND MEAT PROCESSING	DAIRY PRODUCT	FLOUR MILLING
	(Dollar)			
Food processing	0.18	0.36	0.30	0.27
Primary agriculture	0.34	0.16	0.23	0.07
Other manufacturing	0.03	0.04	0.04	0.04
Wholesale	0.04	0.03	0.03	0.07
Retail	0.01	0.01	0.01	0.01
Transportation and warehousing	0.03	0.02	0.04	0.08
Rest of economy	0.19	0.15	0.18	0.16

Source: Statistics Canada, Input-Output Model.

- All food processing sub-industries have large employment multipliers in primary agriculture.
- For example, for every 1% increase in employment in animal slaughtering, there is about a 4% increase in employment in primary agriculture and a 6% increase in employment in the overall economy.

Chart 11
Importance of food processing sub-industries to total employment

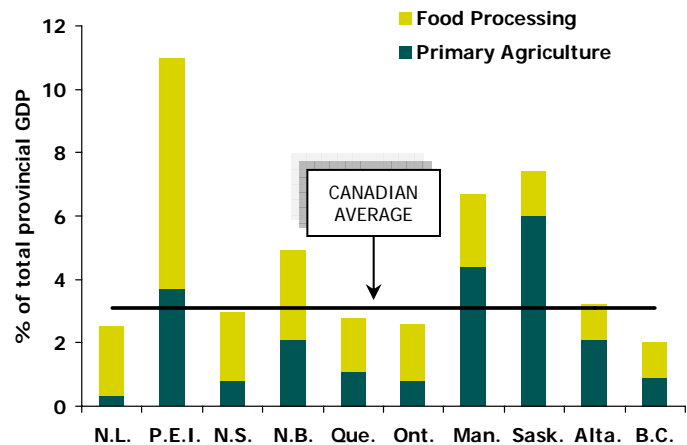
IMPACTS OF A 1% INCREASE IN EMPLOYMENT IN FOOD PROCESSING SUB-INDUSTRIES				
INDUSTRY	ANIMAL SLAUGHTERING	RENDERING AND MEAT PROCESSING	DAIRY PRODUCT	FLOUR MILLING
	(Percent)			
Primary agriculture	3.88	1.15	2.60	1.51
Other manufacturing	0.43	0.57	0.50	0.30
Wholesale	0.29	0.14	0.21	0.64
Retail	0.11	0.06	0.10	0.15
Transportation and warehousing	0.19	0.11	0.29	0.75
Rest of economy	1.40	0.70	1.30	1.26

Source: Statistics Canada, Input-Output Model.

The importance of food processing to the provincial economies varies across provinces

- The relative importance of the food processing industry to provincial economies varies by province. This could be due to several factors such as proximity to consumer markets, input markets and the legislative environment.

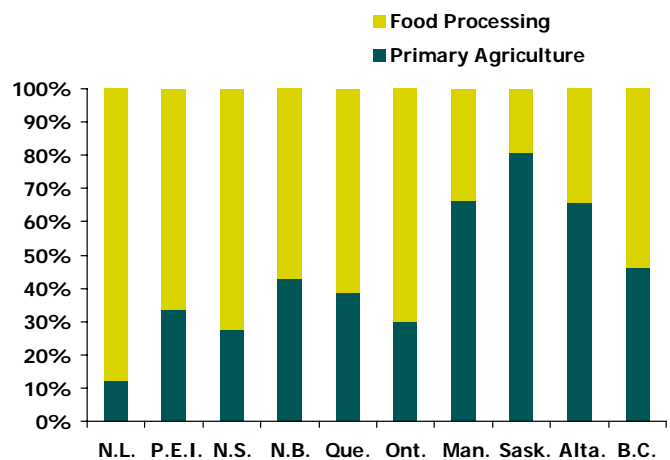
Chart 12
The agriculture and agri-food sector's contribution to provincial GDP (2004)



Note: Excludes Beverages and Tobacco processing.
Source: Statistics Canada.

- The food processing industry is more important to the economies of the Eastern provinces than to those of the Western provinces. This is because food processing GDP is a higher percentage of total agriculture and agri-food GDP in most provinces with the exception of the Prairie provinces.

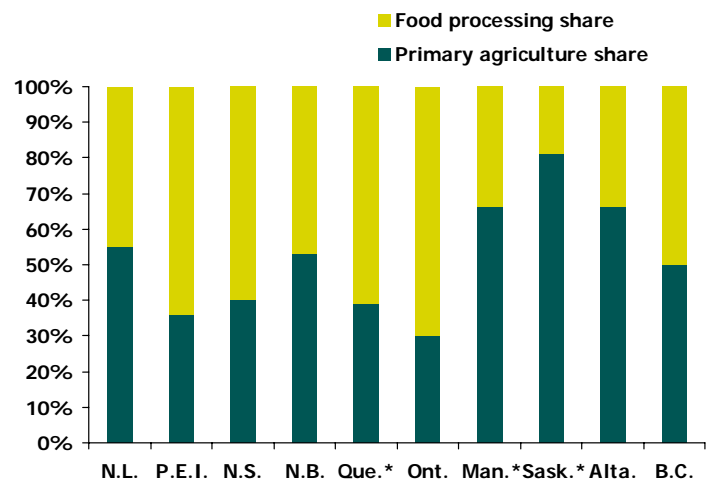
Chart 13
Share of agriculture and food processing GDP (with seafood processing) (2004)



The importance of food processing to the agriculture and agri-food sectors in the provincial economies varies across provinces

- However, if seafood is excluded from food processing, then food processing is a smaller percent of the total agriculture and agri-food sector for Newfoundland (45%) and New Brunswick (47%).

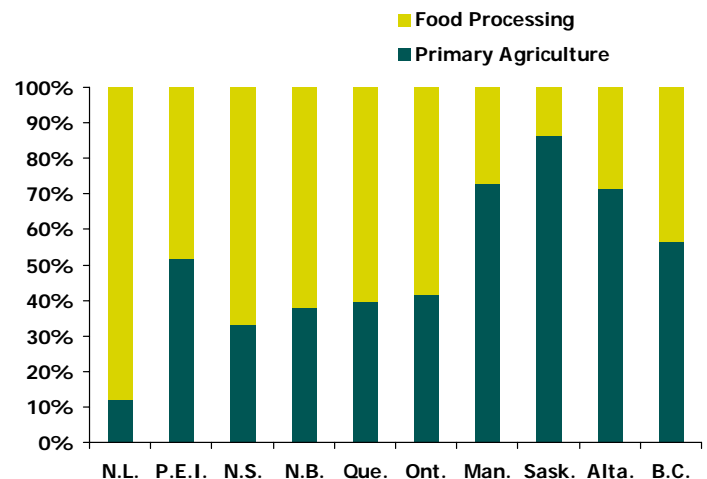
Chart 14
Share of agriculture and food processing GDP (excluding seafood)



*Seafood processing GDP was confidential in these provinces and assumed 0.
Source: Statistics Canada.

- Food processing employment is also a higher percentage than agriculture employment in the provincial job markets of most provinces with the exception of the Prairie provinces and British Columbia.
- The proportion of food processing employment is particularly higher in the Maritimes. For example, in Newfoundland, about 88% of agriculture and agri-food employment is accounted for by food processing.
- However, if seafood is excluded, then food processing accounts for only 48% of agriculture and agri-food employment in Newfoundland. The same applies to Nova Scotia and New Brunswick where the proportion of employment from food processing decreases to 49% and 51% from near 70% and 55% respectively when seafood is excluded.

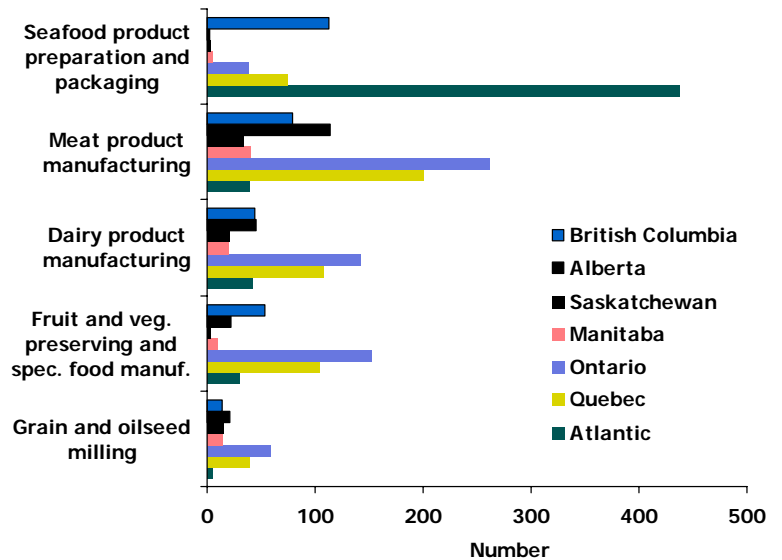
Chart 15
Share of food processing employment in agriculture and agri-food (2004)



Provincial food processing industries vary by type and importance

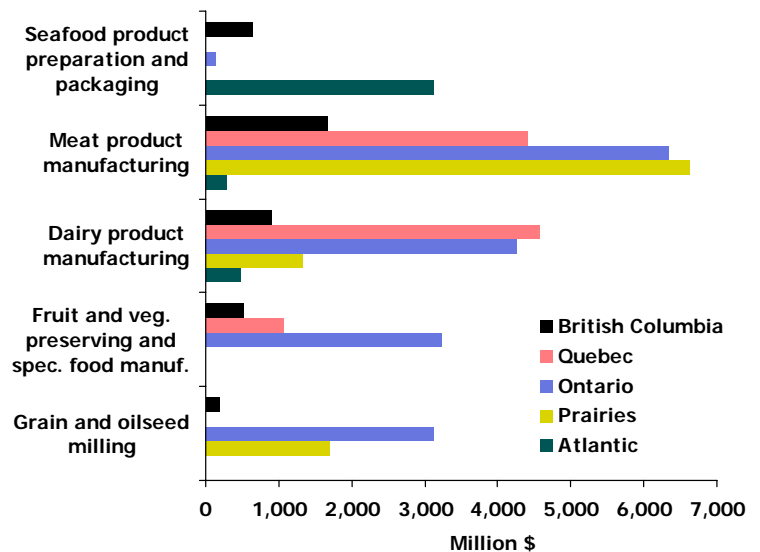
- Ontario and Quebec together account for almost 50% of all food processing establishments in Canada.
- The location of food processing plants has changed, with more meat processing plants moving to Manitoba and Alberta from Ontario.
- The Alberta food processing industry is dominated by meat processing while the Atlantic provinces and British Columbia are dominated by seafood products.
- Quebec, Ontario and British Columbia food processing industries are dominated by dairy and meat product processing.
- Saskatchewan food processing industries are dominated by grains and oilseed milling while Manitoba is dominated by meat processing.
- Policy formulation may need to recognize such differences in the importance of the various food industries across provinces.

Chart 16
Food processing number of establishments by region/province (2003)



Source: Statistics Canada.

Chart 17
Food processing value of shipments by region/province (2005)

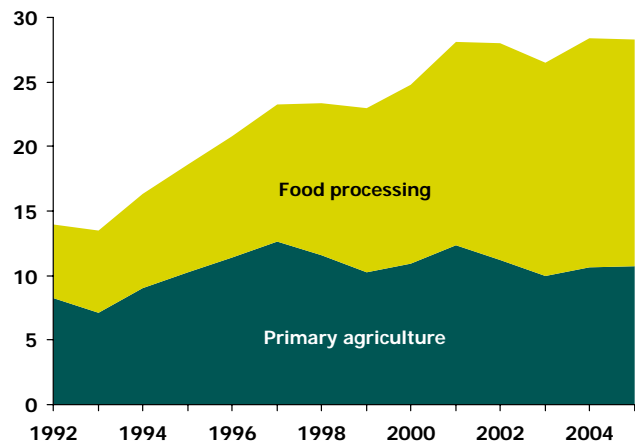


Source: Statistics Canada, ESTAT-Monthly Survey of Manufacturers.

Food processing sector growth has been driven by the growth in exports, as the sector has become increasingly export-oriented over time

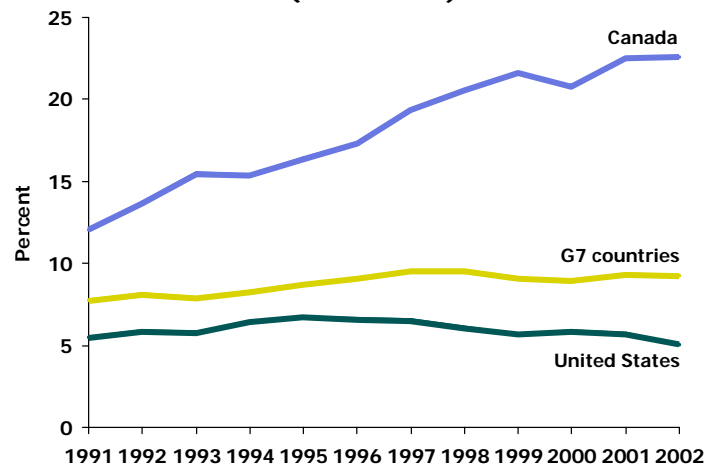
- The food processing industry has responded to globalization and market pressures and become more export oriented over time.
- A limited domestic market and its growth against scale economics also drove exports.
- Food processing exports have driven the growth in agriculture and agri-food exports, rising from \$5.7 billion in 1992 to \$17.6 billion in 2005.
- This has contributed to the growth in value-added exports, which have increased as a share of total agriculture and agri-food exports from 52.6% in 1990 to about 78.1% in 2005.
- However, the trade impact of BSE and the appreciation of the Canadian dollar since 2003 have in part resulted in recent reductions in food processing exports. The higher exchange rate continues to pose challenges for the sector.
- Compared to the U.S. and G7 countries, the Canadian food processing sector is more export-oriented, with 23% of production exported in 2002 relative to the U.S.'s 5%.

Chart 18
Agriculture and food processing exports (1992-2005)



Source: Statistics Canada and AAFC calculations.

Chart 19
Food products, beverages and tobacco – Exports as percentage of total production – (1991-2002)

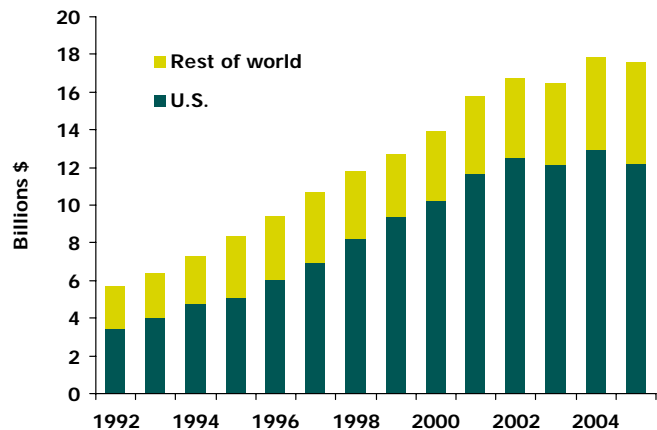


Source: OECD.

A large share of this export growth has been to the U.S., Japan and Mexico

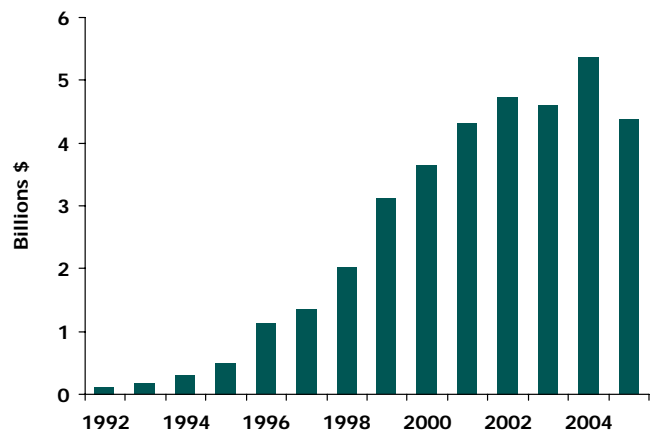
- Exports to the U.S. and Mexico are increasing as a result of North American integration and account for 72% of processed food exports.
- Food processing exports to North America have quadrupled since 1992.
- Exports to the U.S. accounted for 69% of Canada's total processed food export sales in 2005.
- The trade surplus with the U.S. in food processing increased from \$120 M in 1992 to \$4.38 B in 2005.
- Japan is the 2nd most important export market for Canada after the U.S., accounting for 10% of total processed food exports.
- New markets in countries such as China and South Korea, Taiwan and Hong Kong are contributing to export growth to the rest of the world for Canadian food processing industries.

Chart 20
Food processing exports to the U.S. and rest of world (1992-2005)



Source: Statistics Canada and AAFC calculations.

Chart 21
Trade balance with the U.S. in food processing (1992-2005)

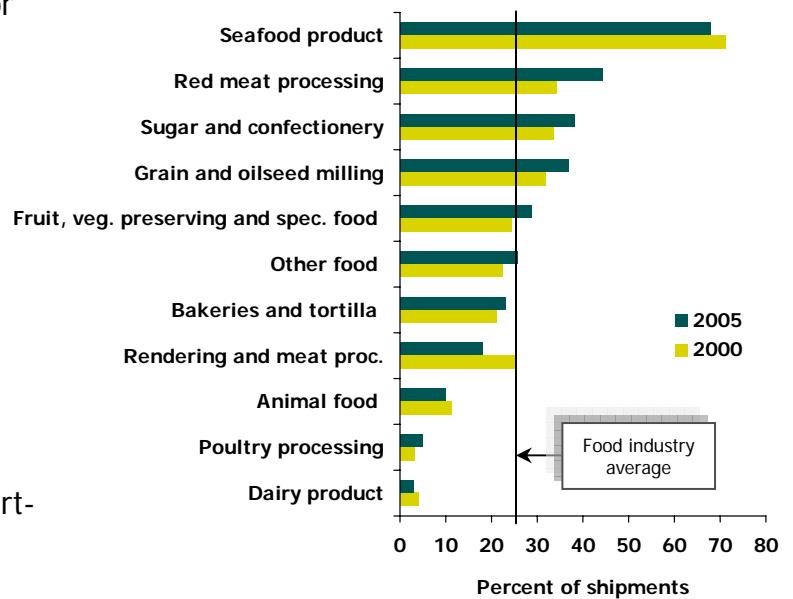


Source: Statistics Canada and AAFC calculations.

Some food processing sub-industries are more export oriented than others

- Many Canadian food processing establishments have been able to improve performance by producing for the growing export market.
- Some industries such as seafood processing produce primarily for export markets, while animal food processing is more domestically oriented.
- Red meat processing is also more dependent on exports than dairy product manufacturing.
- Seafood processing is also more import-intensive.

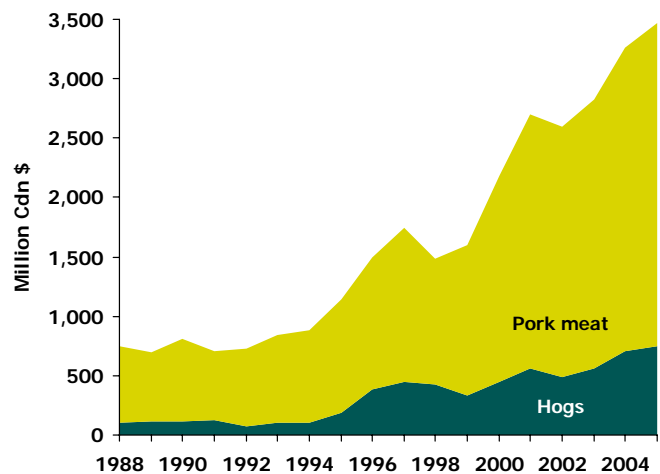
Chart 22
Food manufacturing export intensities (2000 and 2005)



Source: Statistics Canada.

- Processed pork is an example of an industry that has increased its exports significantly over time to meet demands in global markets.
- Most of these exports are destined for the U.S. market, but Japan and Australia are also important export destinations.
- The hog and pork industry have become increasingly integrated in the North American market with Canada supplying weaner pigs to the U.S. where they are fed and slaughtered.
- Given the challenges arising from an appreciating dollar, Canadian pork processing industries are adjusting their strategies to concentrate on the production of higher value-added products for export markets.

Chart 23
Pork export value (1998-2005)



Source: Statistics Canada.

The result has been a sector that increased its relative trade advantage* (RTA) and world export market share

- Between 1999 and 2004 Canada increased its competitiveness in pork production as it diversified its export markets and increased its comparative advantage over the past few years.
- The beef and grain milling industries have also increased their relative trade advantage since 1999.
- Comparative advantage of the beef industry would have been higher without the BSE as the U.S. border closure restricted exports.

Chart 24
Relative trade advantage* (RTA)

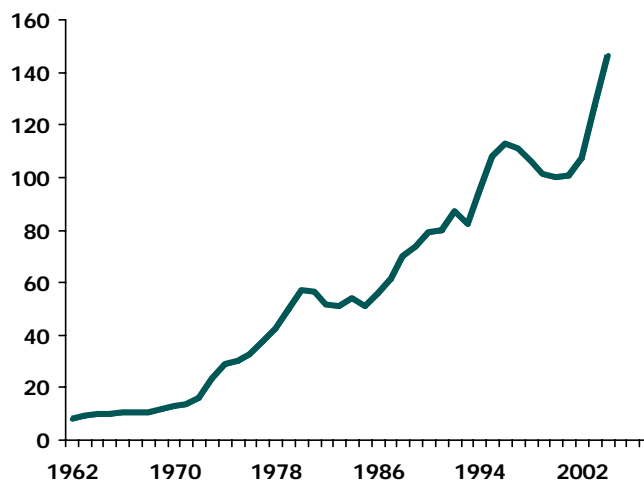


* RTA of a given product is measured by a country's net share of world trade for that product relative to the net share of all traded goods.
Source: AAFC calculations based on Global Trade Atlas.

Canada's export competitiveness in food processing is increasingly being challenged by rising international competition and an appreciating dollar

- Trade liberalization and increased production by low cost producers have led to increased world trade in agri-food products.
- Total world agri-food exports have increased by almost 50% since 2000.
- Even though Canada is highly export oriented, its share of world agri-food exports has declined over the past few years from 4.1% in 2001 to 3.4% in 2004.
- Canada was the third major world exporter of agri-food products in 2001 but only the fifth major exporter in 2004.

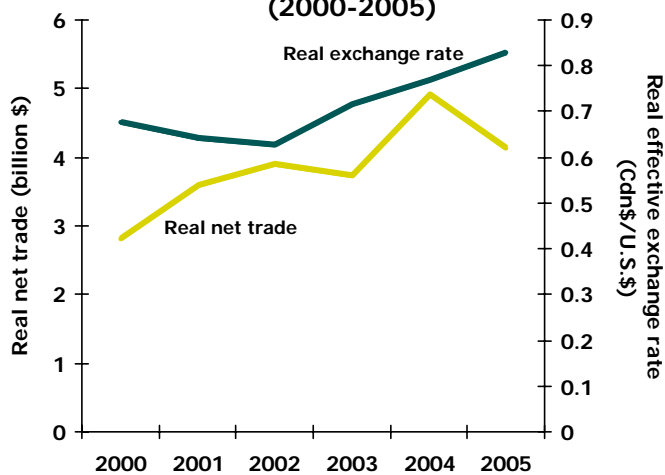
Chart 25
Index of total world exports
(1992-2004)



Source: FAO Statistics Division, 2006.

- Movements in the exchange rate have important consequences for exports and investments.
- For export oriented products such as processed meat and seafood, an appreciating dollar will negatively affect exports whereas imported goods will be positively affected. Net trade in real terms declined by 16% between 2004 and 2005.
- The Canadian dollar in real terms has appreciated significantly over the past few years from \$0.64 in 2002 to \$0.87 in 2006.

Chart 26
Real effective exchange rate*
and real net trade
(2000-2005)



*The effective exchange rate is the Canadian/U.S. dollar exchange rate divided by purchasing power parity.

Source: Statistics Canada and AAFC calculations.

The increase in export orientation and competitiveness has happened through significant structural adjustment and consolidation

- The pork industry is a prime example of an industry that experienced significant structural change since 1971 as a result of new technology and increased productivity.
- The pork industry's success in export growth has been accompanied by changes in its business model.
- Relationships between hog farms and meat processors changed significantly with increased contracting and vertical integration such that more than 90% of production was contracted in 2001.
- At the same time, the average slaughtering capacity in slaughtering plants has risen dramatically, almost doubling between 1994 and 2004.

Chart 27
Transformation of the pork industry
(1971 to 2001)

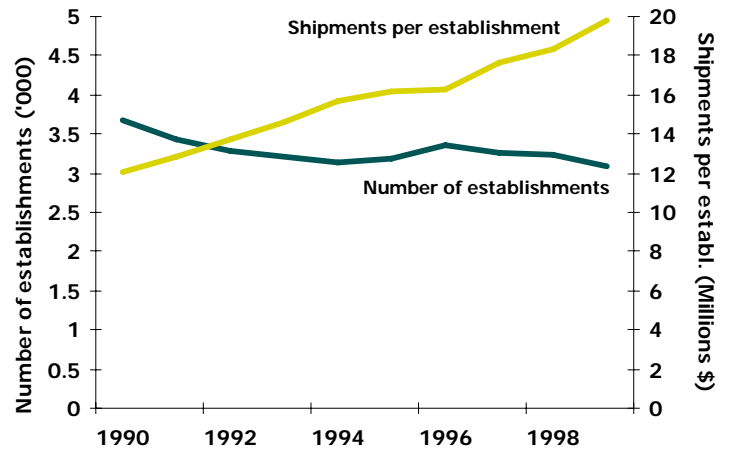
	1971	2001
Vertical integration	More than 90% of hogs sold on spot market	More than 90% of hogs sold on contract
	1994	2004
# of federally inspected slaughtering plants	50	43
Average # of hogs slaughtered per plant per year	283,655	500,879

Source: Statistics Canada, Census of Agriculture and AAFC calculations.

Structural adjustment has been occurring in the entire food processing industry, leading to increased consolidation

- The food processing industry has undergone significant structural change since the early 1990s, as a result of globalization and increased integration in the North American market.
- The number of establishments in food processing has been declining while average shipments per establishment have increased – leading to consolidation in food processing.
- With the number of establishments declining, the scale of operation has grown, increasing the efficiency of food processing plants.

Chart 28
Structure of the food processing sector (1990-1999)*



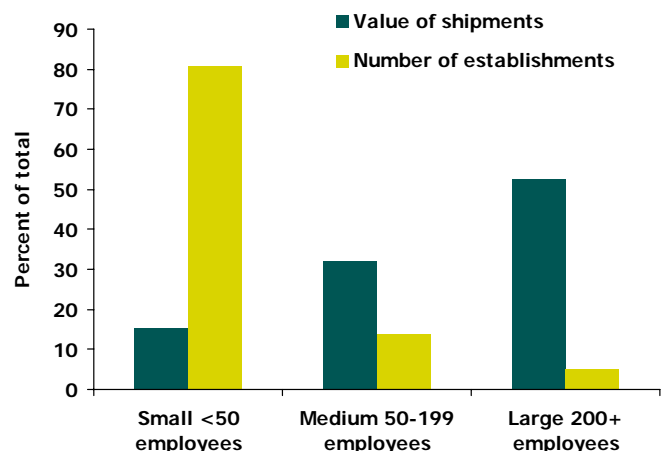
*Data before and after 2000 are not comparable due to conceptual and methodological changes made to the Annual Survey of Manufactures in 2000.

Note: Data has been adjusted to exclude retail bakeries.

Source: Statistics Canada, Annual Survey of Manufactures.

- Consolidation in food processing is reflected in the fact that the largest 5% of food manufacturing establishments accounted for over 50% of sales in 2003 whereas the smallest 80% accounted for 15% of sales.
- This is comparable to primary agriculture where the largest 5% of farms (revenues over \$500,000) accounted for 50% of production in 2000.

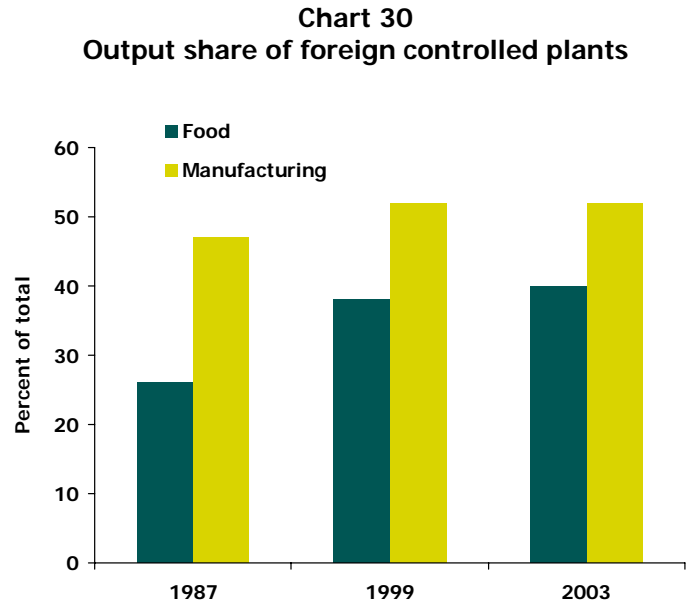
Chart 29
Distribution of FBT processing shipments and number of establishments by employment size (2003)



Source: Statistics Canada, Annual Survey of Manufactures.

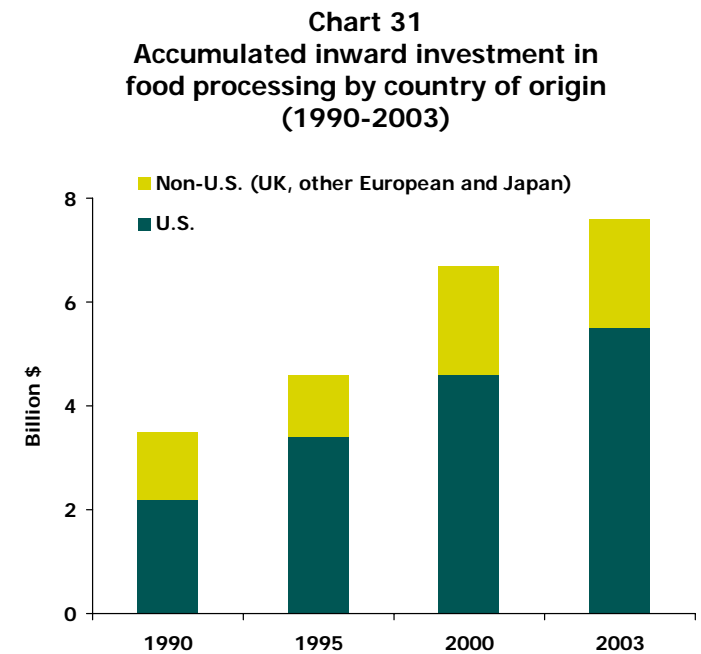
The share of food processing output produced by foreign-controlled plants has risen since the 1980's

- The share of food processing output produced by foreign-controlled plants rose from 25% in 1987 to 40% in 2003.
- However, this industry's foreign-ownership shares are still below those of total manufacturing.
- Trade liberalization and a deregulation of foreign direct investment (FDI) rules throughout the developed world during the 1990s contributed to these trends.



Source: Statistics Canada, Corporations Returns Act.

- The sector has successfully attracted FDI from both U.S. and non U.S. sources since the early 1990s.
- For example, Wrigley's moved its Lifesavers plant from the U.S. to Canada in response to the lower cost of sugar inputs in Canada compared to the U.S., due in part to U.S. sugar policy.
- About 75% of foreign direct investment in food processing is from the U.S.
- However, increasingly, inward FDI is from non-U.S. countries, such as the UK, Japan, and Europe.
- For example, Parmalat, an Italian MNE, acquired significant assets in the Canadian dairy processing industry in 1997.

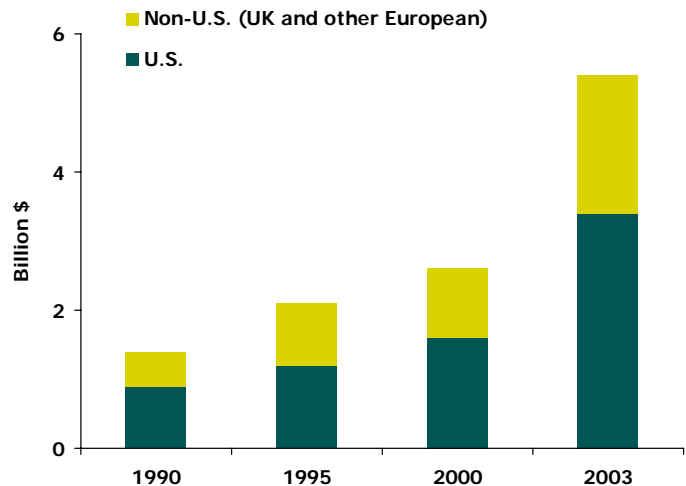


Source: Statistics Canada, Balance of International Payments.

Canadian firms are also investing in food processing industries in other countries as they become world class players

- Total outward investment increased from \$1.4 billion in 1990 to \$5.4 billion in 2003.
- About 62% of outward investment goes to the U.S., indicating the strong linkage between Canadian and U.S. food industries.
- The net effect of inward and outward FDI has been a net capital injection into the Canadian food processing sector.
- McCain's and Maple Leaf Foods are two examples of Canadian-owned food processing firms which have been investing abroad.

Chart 32
Accumulated outward investment in food processing by country of destination (1990-2003)

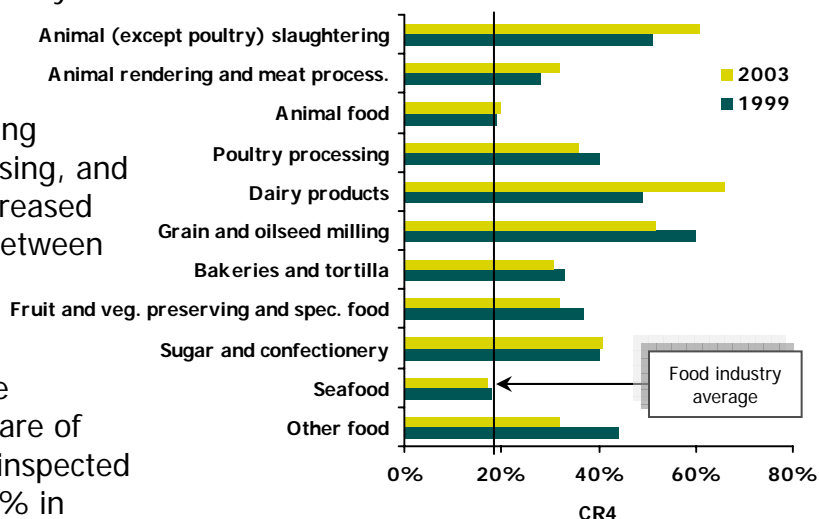


Source: Statistics Canada, Balance of International Payments.

Increased consolidation has not necessarily led to increased concentration in all industries

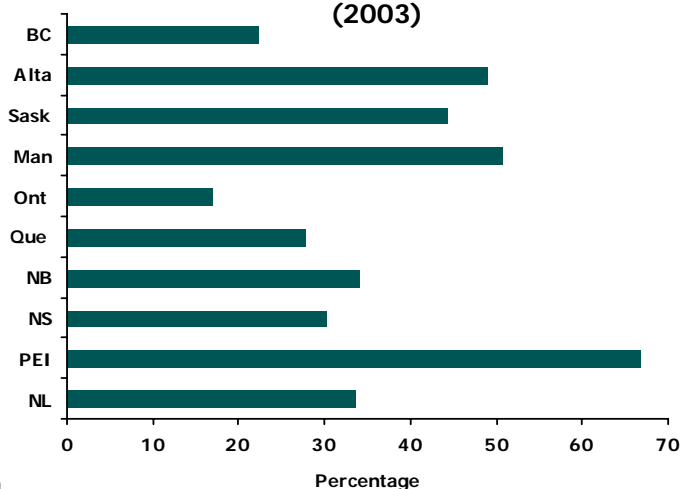
- Concentration is measured by the share of production of the top firms. It is generally considered to be an indicator of market power.
- In food processing, animal slaughtering and rendering, dairy products processing, and sugar and confectionery reported increased market share for the top four firms between 1999 and 2003.
- The concentration of both pork processing and beef processing have increased in recent years with the share of hogs slaughtered at the four largest inspected plants rising from 54% in 1994 to 76% in 2005 and the share of cattle slaughtered at the four largest plants rising from 66% to 91% (Conference Board of Canada, 2006).
- Concentration ratios in food processing vary by province with Prince Edward Island showing the highest ratio and Ontario the lowest.
- At the sub-industry and provincial level, it is very difficult to obtain data on firm concentration and for specific sectors and products. This data is deemed confidential by Statistics Canada which implies that three or fewer firms (the cutoff for confidentiality) control 100 percent of the market in these jurisdictions or markets. This makes it difficult to do an analysis of market power.
- More analysis is required and is currently underway on the link between concentration, price transmission and market power in the agri-food sector but conclusive statements can not be made at this time.

Chart 33
Concentration ratio* in food processing (1999-2003)



*Concentration ratio measures the output share of the top four firms.
Source: Statistics Canada.

Chart 34
Concentration ratio in food processing, by province (2003)

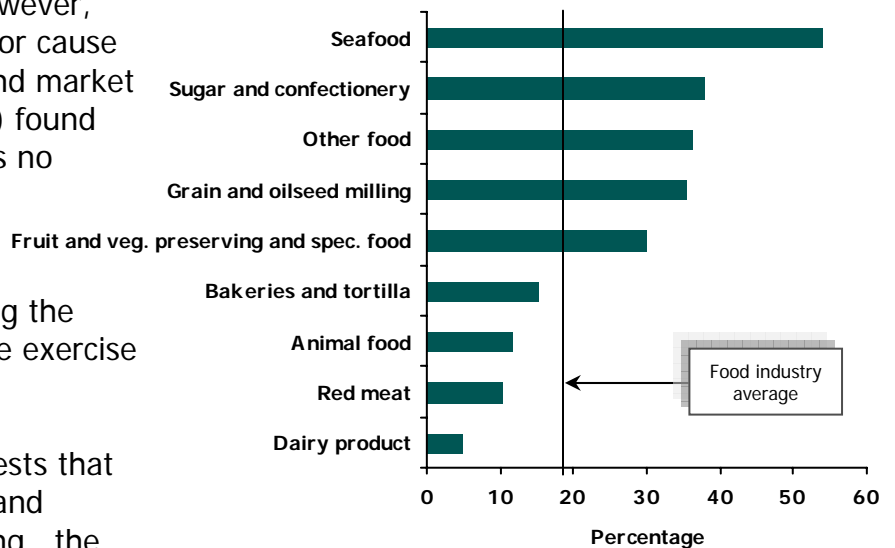


Source: Statistics Canada.

The impact of concentration and market power are not necessarily reduced by trade liberalization

- Studies show that industry concentration is reduced when adjusted for trade (Harrison and Rude, 2002). However, trade liberalization is not a major cause for changes in concentration and market power. Rude and Fulton (2001) found that an open economy provides no guarantees against market power. In both studies, data limitations were determined to be a major problem in assessing the impact of concentration and the exercise of market power.
- A review of the literature suggests that when analysing concentration and market power in food processing, the specification of the relevant market is important and is a critical determinant of whether firms can exercise market power.
- Given the importance of imports for some sectors, it is more difficult to exert market power by industries, such as seafood processing that are import intensive and rely heavily on global markets.

Chart 35
Import intensity
(2005)



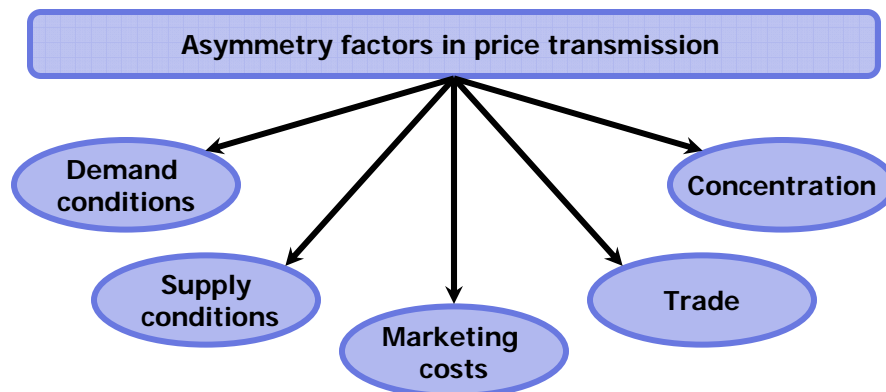
Source: Statistics Canada and AAFC calculations.

Rising concentration is often associated with increased market power and rising price spreads, and this varies by province and region

- With rising concentration, firms in the retailing and processing industries tend to be in a position to exercise market power and influence price spreads.
- Price spreads can widen between levels of the supply chain (farmers, processors, retailers). If prices move up and down more quickly at one level versus another, this is called “price asymmetry”.
- Price transmission refers to the movement of one level’s prices in response to another level’s prices (i.e., prices increases or decreases at the farm level result in price increases or decreases at the processing level).

Asymmetry refers to the extent to which prices move up and down together with the price of the same product elsewhere, in a competitively linked environment

Price transmission = price adjustment

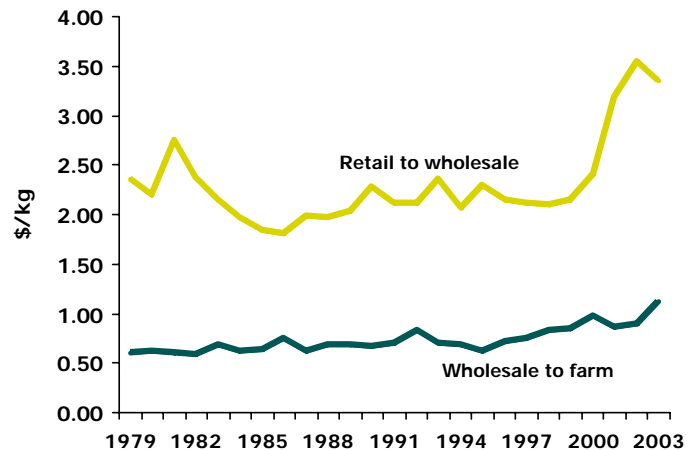


- As these factors vary across provinces and regions, the extent of market power and asymmetries in price transmission are subject to spatial variations.
- Lack of provincial/regional data on wholesale prices of processed products is the main impediment to empirical assessment of regional asymmetries in price transmission and the presence of market power. On the other hand, evidence is not conclusive that increasing concentration in food processing industries is leading to rising price spreads (Peltzman, 2000).
- Given the regional concentration of some food processing industries, some regions may experience the effects of market power on prices, whereas other regions may not.

The extent of market power varies along the supply chain depending on the changes in price adjustments from farmers to retailers

- In the case of red meat processing, the market share of the top 4 firms increased from 28% to 32% in Canada between 1999 and 2003. At the same time, wholesale to farm price spreads for beef products increased from around \$0.85/kg in 1999 to about \$1.10/kg in 2003. According to Larue and Gervais (2005), the retail price has grown at a faster pace than the farm price, particularly in Alberta.
- The border closure after BSE in May 2003 and low domestic slaughtering capacity may have contributed to these rising price spreads (Standing Committee on Agriculture and Agri-Food, November 2005).
- A recent study by the OECD (2006) found that retail pricing behaviour in Canada deviated from competitive pricing for beef.
- Preliminary results of the analysis of price transmission in the markets for beef done by AAFC on price transmission from January 1995 to September 2006 reveal significant asymmetry in adjustments of retail beef prices in response to rises and falls in wholesale prices of boxed beef.
- Retail prices adjusted faster and more completely to a rise in wholesale prices than to a fall. On the contrary, wholesale prices adjusted faster and more steadily to a fall in farm prices than to a rise. However, the extent of asymmetry in adjustment between wholesale and farm prices has not been found to be significant.
- A supplementary analysis of the margins implies that the retailers are exercising some degree of oligopoly and oligopsony in the respective markets.

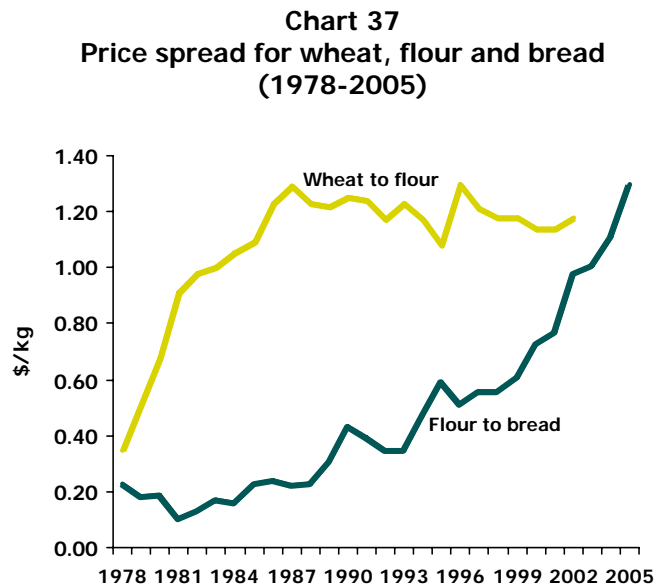
Chart 36
Price spread for beef
(1979-2003)



The extent of market power varies along the supply chain depending on the changes in price adjustments from farmers to retailers

- Analysis of the price transmission in the markets for pork
 - ❖ Preliminary results of the study also reveal asymmetric adjustments of wholesale prices of pork in response to rises and falls of farm prices. Estimated parameters indicate that the wholesale prices adjust faster and more completely to a rise in hog prices than to a fall.
 - ❖ However, no significant asymmetry between retail and wholesale prices of pork is detected as retail prices adjust almost simultaneously to rises and falls in wholesale prices.
 - ❖ Results of the analysis of margins suggest the possibility that both the processors and the retailers are exercising some degree of oligopoly in the relevant markets.

- In the case of grains and oilseed milling, the market share of the top 4 firms decreased from 60% to 52% in Canada between 1999 and 2003. At the same time, the price spread between wheat and flour remained relatively stable.
- Concentration in bakeries also fell between 1999 and 2003, yet the price spread between flour and bread rose, possibly reflecting the growth in higher quality specialty breads that command a premium.

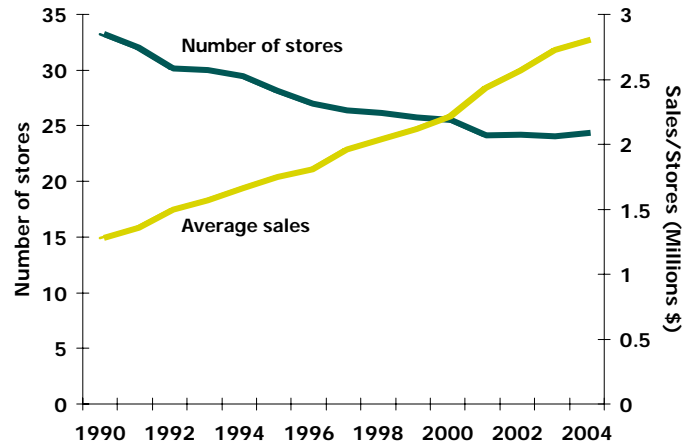


- Analysis of the price transmission in the markets for bread, flour and wheat also determine there is asymmetry in adjustments of wholesale prices of flour in response to rises and falls in wheat prices.
- The results reveal that the magnitude of adjustments in wholesale flour prices in response to a rise in wheat price is greater than to a fall.
- No asymmetry in adjustment between retail bread prices and wholesale flour prices is detected in the preliminary analysis.
- An analysis of the margins produces some evidence of oligopoly in the wholesale market for flour.

Rising concentration in food processing occurred at the same time that food retailing has also seen an increase in consolidation

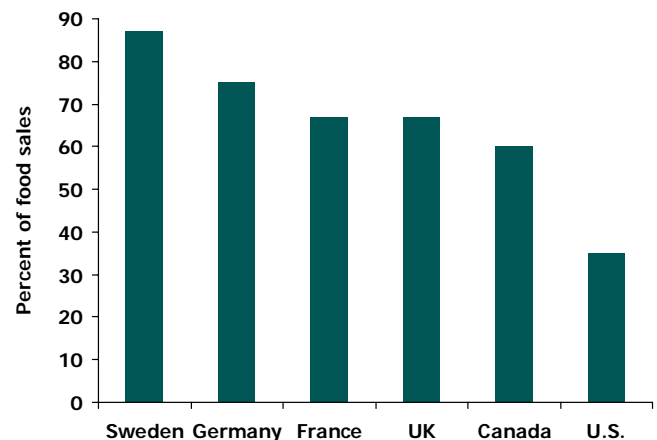
- The Canadian food retail industry has undergone significant structural change as well since the early 1990s becoming larger and more concentrated.
- The number of food retail stores in Canada declined from about 32,000 in 1990 to around 24,000 in 2004 and the average sales per store more than doubled over the same time period.
- In 2005, there were only four major supermarket chains in Canada (i.e. Loblaw's, Sobey's, Safeway, Metro), after a major acquisition by Metro Inc. of A&P Canada in July 2004.
- However, concentration and consolidation is a global trend in food retailing, occurring in countries around the world. The market share of the top five retailers in the European Union and North America has increased in the last five years. In Canada, food retail concentration is still lower than in some European countries.
- While the Canadian retail food industry has become increasingly concentrated, there has also been a rise in competition from non-traditional retailers selling food such as drug stores, convenience stores and mass merchandising and club stores (e.g. Costco, Walmart).
- Retail food is particularly concentrated at the local level but over time is facing increased competition from these non-traditional retailers.
- Vertical integration is a strong factor in food retailing and many food processors are vertically integrated or contract heavily with the major retailers.

Chart 38
Number of Canadian food stores and average sales (1990-2004)



Source: Canadian Grocer, Statistics Canada and AAFC calculations.

Chart 39
Market share of the top 5 food retailers (1999)



Source: Dobson Consulting (1999) and USDA.

Section B

Food Industry Performance



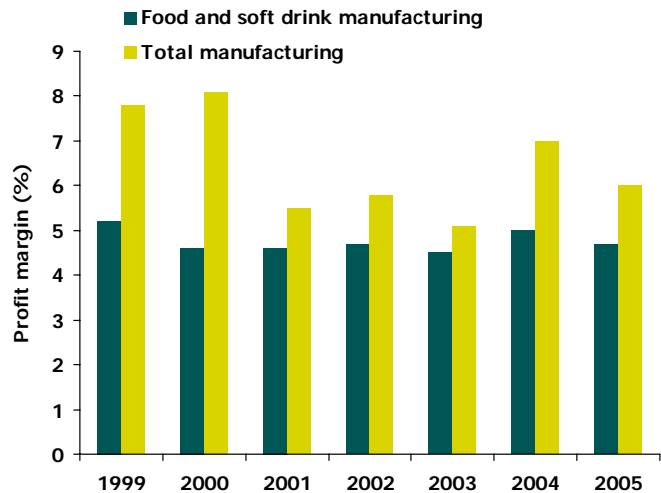
Summary

- Food processing industry restructuring has allowed profit margins in food processing to remain stable, but below total manufacturing.
- Profitability in food processing varies by size, country of ownership and by sub-industry.
- Profit margins are continuously challenged by rising costs such as for materials and supplies and rising energy prices.
- Wage rates in food processing have risen less than in other sectors of the economy and this is contributing to labour shortages in food processing, particularly in some provinces.
- Debt to equity ratios in food processing have been rising over time relative to total manufacturing.
- Future profitability will depend on the food processing industry's ability to invest in new capital and adjust to changing global factors that are challenging their costs and their ability to compete.

Food processing industry restructuring has allowed profit margins in food processing to remain stable, but below those in total manufacturing

- Food processing is a stable industry that is less cyclical in nature than durable goods manufacturing such as cars or appliances.
- Since 1999, profit margins in food processing have been stable, but below total manufacturing, reflecting relatively flat revenue growth and modest input price increases (CBOC, summer 2006).

Chart 40
Profit margins in food and total manufacturing (1991-2005)

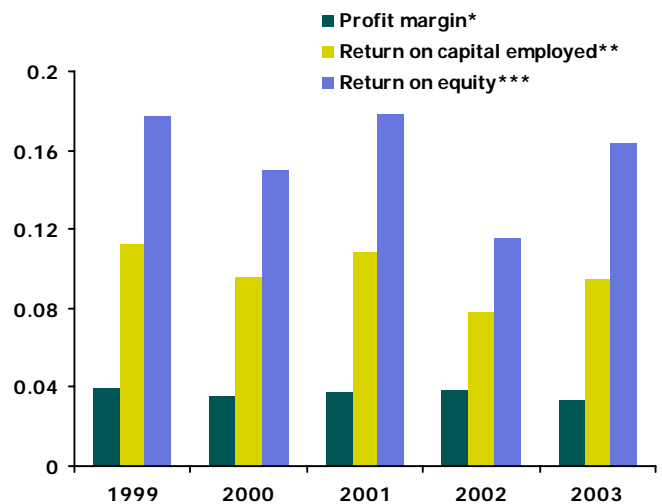


Note: Profit margins are measured by operating profits over operating revenues before taxes.

Source: Statistics Canada, Quarterly Financial Returns Act.

- Whereas profit margins remained relatively stable, return on capital employed, which measures the percentage return on total capital provided by the owners and lenders decreased from 11.2% in 1999 to 9.4% in 2003.
- Return on equity, which measures the return to the owners (investors) and represents the level of profitability to owners, decreased marginally from 17.8% in 1999 to 16.3% in 2003.
- The declining return on equity and return on total capital may indicate increased borrowing, higher opportunity cost or increased competition.

Chart 41
Financial ratios in food manufacturing (1999-2005)



* The ratio of operating profits to total operating revenue.

** It is the ratio of profits before extraordinary gains and interest on borrowing net of tax to the sum of borrowings, loans and accounts with affiliates and total equity.

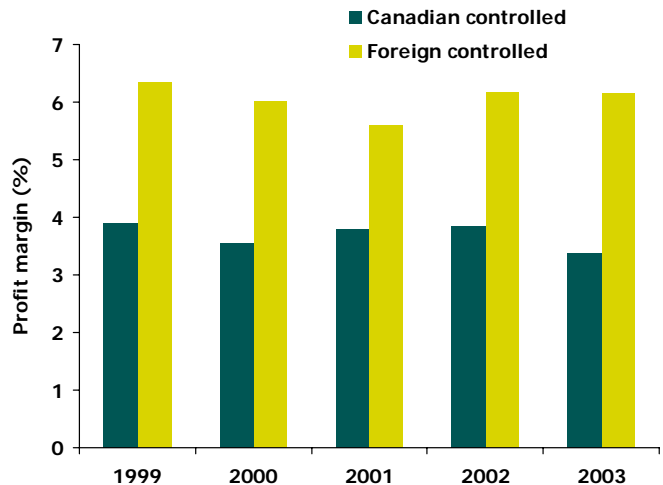
*** It is calculated as the ratio of profits before extraordinary gains to total equity.

Source: Statistics Canada, Quarterly Financial Returns Act.

Profitability in food processing varies by size, country of ownership and by sub-industry

- Foreign-controlled establishments, which are growing in importance in Canadian food processing, have higher profit margins than Canadian controlled ones.
- Foreign controlled establishments which are generally multinationals, tend to be larger than Canadian controlled ones, which may explain in part why foreign controlled establishments have higher profit margins.

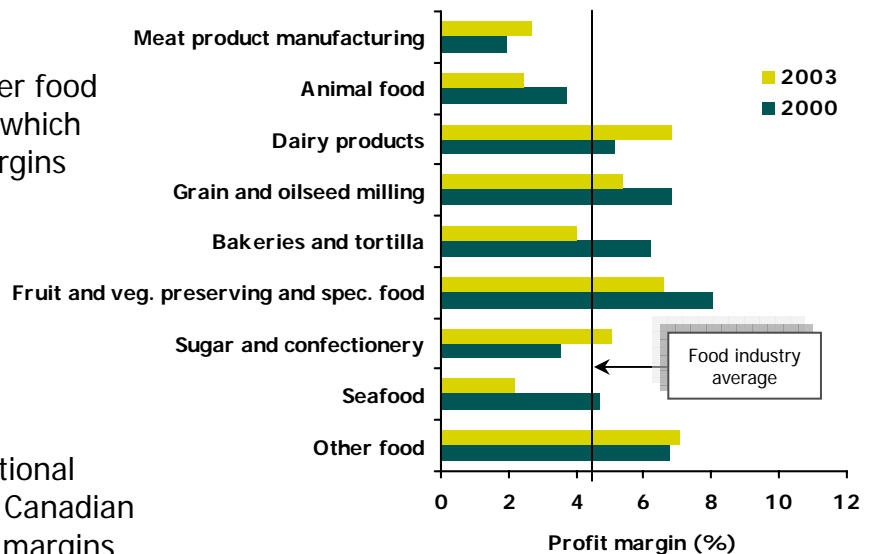
Chart 42
Profit margins in food and total manufacturing (1991-2003)



Source: Statistics Canada, Corporations Returns Act.

- For most food manufacturing products, profit margins decreased between 2000 and 2003.
- Dairy product processing and other food industries are the only industries which recorded an increase in profit margins between 2000 and 2003.
- Fruits and vegetables processing saw a significant decline in profit margins from 8% in 2000 to 6.6% in 2003.
- Increased pressures from international competitors and the appreciating Canadian dollar may further squeeze profit margins for most food manufacturing industries over the near term.

Chart 43
Profit margins by food manufacturing industry (2000 and 2003)

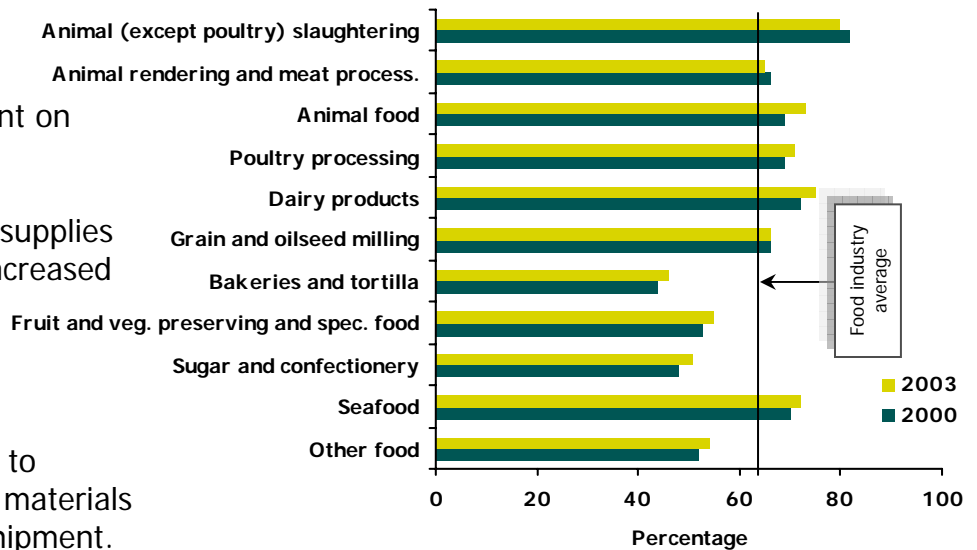


Source: Statistics Canada, Corporations Returns Act.

Profit margins are continuously challenged by rising costs such as for materials and supplies and energy

- The cost of raw materials is the most important input cost in the food processing sector. On average, for every dollar of shipments, more than 60 cents is spent on materials and supplies.
- The cost of materials and supplies as a share of shipments increased for most food processing industries between 2000 and 2003.
- Animal slaughtering tends to record the highest cost of materials and supplies per unit of shipment.
- Bakeries and tortilla processing and other food are the only food processing industries where the ratio of cost of materials and supplies to shipments is less than 50%.
- Energy cost per dollar of shipments is increasing faster than all other components.
- World oil prices rose by 66% between 2000 and 2003 and continued to rise a further 140% between 2003 and 2006.
- This has significantly affected industries that depend on fuel and electricity, such as grain and oilseed milling and bakeries.

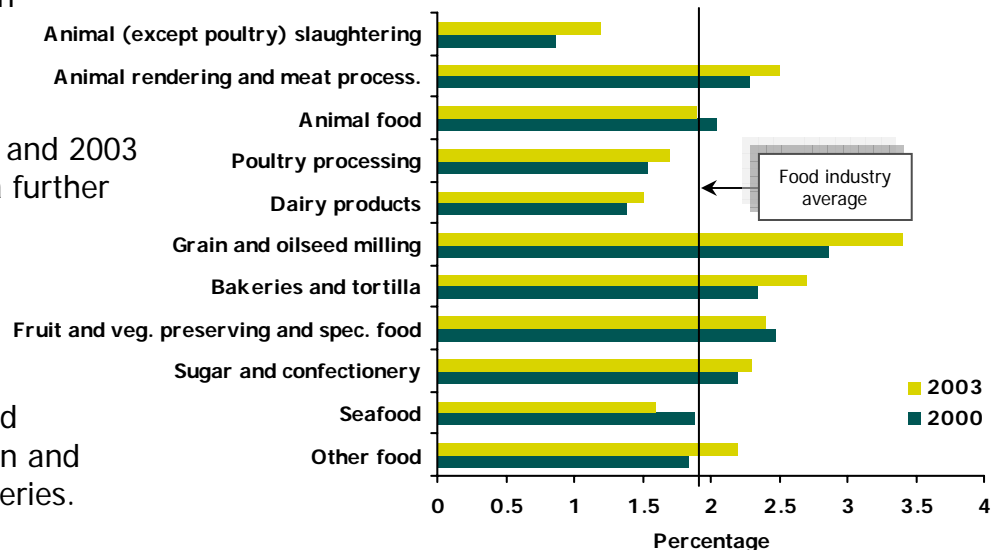
Chart 44
Cost of materials and supplies*/Shipments (2000 and 2003)



*The cost of materials and supplies includes costs of raw materials and components, containers and other, shipping and packaging materials, repairs and maintenance and sub-contracts.

Source: Statistics Canada, Annual Survey of Manufactures.

Chart 45
Cost of fuel and electricity/Shipments (2000 and 2003)

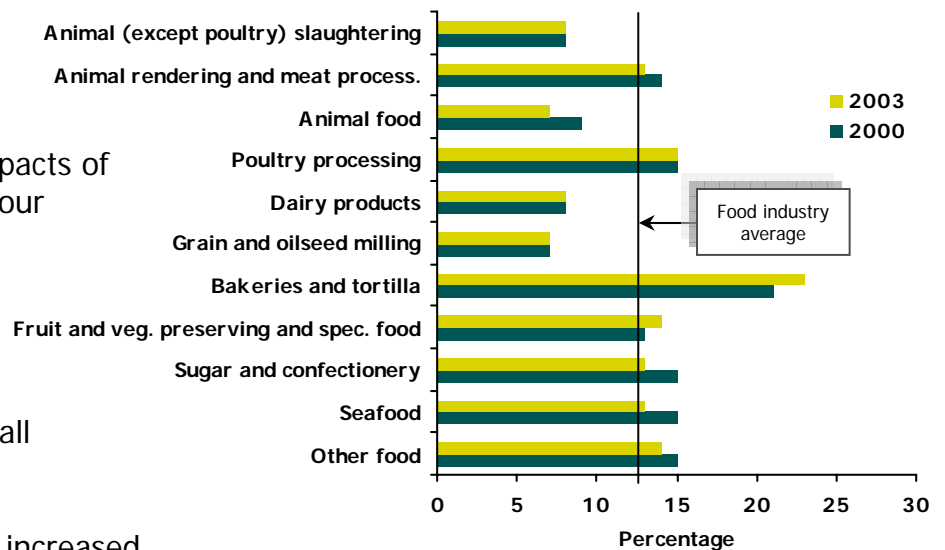


Source: Statistics Canada, Annual Survey of Manufactures.

The cost of labour, on the other hand, decreased for all food manufacturing industries between 2000 and 2003 but may be contributing to labour shortages

- The decrease in the cost of labour per dollar of shipment was particularly significant in seafood, and sugar and confectionery product manufacturing.
- This possibly reflects the impacts of technological change on labour productivity.
- At the same time wage rates in food processing have risen less than in total manufacturing and the overall economy.
- However, labour costs have increased in most provinces, particularly in Alberta where there is intense competition between different economic sectors for labour.

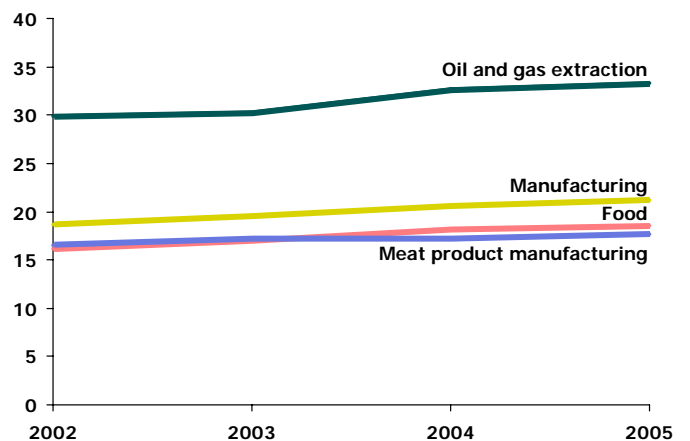
Chart 46
Wages and salaries/Shipments
(2000 and 2003)



Source: Statistics Canada, Annual Survey of Manufactures.

- A lower wage rate in food manufacturing compared to other sectors of the economy is leading to labour shortages in the industry.
- For example, the higher wage rates in oil and gas extraction in Alberta means competition for labour between food manufacturing and oil and gas extraction.

Chart 47
Average hourly earnings (incl. overtime)
by industry, Alberta

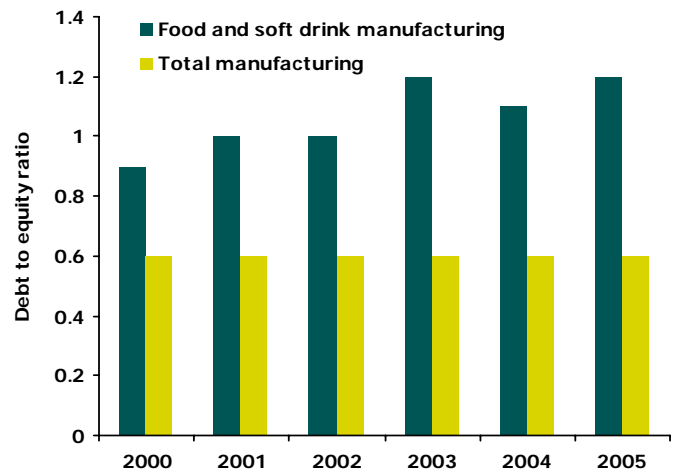


Source: Statistics Canada, Survey of Employment, Earnings and Hours.

The increasing debt levels in the food processing industry is also a challenge for continued profitability and sustainability

- Debt to equity ratios in food processing have been rising over time relative to total manufacturing.
- The industry-wide debt to equity ratio in food processing increased on average from 0.9% in 2000 to 1.2% in 2005 and was consistently higher than the average for total manufacturing over this period.
- Increases in the debt to equity ratio may indicate financial stress and risk to long term sustainability of the food processing industry or it may also reflect increased borrowing to invest in new plants and technologies.

Chart 48
Debt to equity ratio of selected industries (2000-2005)



Source: Statistics Canada, Quarterly Survey of Financial Statistics for Enterprises.

- Relatively low interest rates over the past six years may be encouraging borrowing and investing in food processing.

Chart 49
Chartered bank administered interest rates - prime business (1985 to 2006)



Source: Statistics Canada.

Section C

**Opportunities to Improve
Competitiveness Through
Productivity Growth and
Innovation in Food
Processing**



Summary

- Profitability in Canadian food processing can be enhanced through productivity improvements.
- Canada's agri-food industry has experienced strong productivity growth in the past.
- The Canadian food processing sector has outperformed other OECD countries in terms of productivity in the past.
- But staying ahead will require continued innovation and adaptation to changing market conditions such as from opportunities arising from consumer demands for quality attributes.
- Productivity improvements depend on investments in R&D, innovation and public infrastructure, removal of regulatory impediments and improvement in skills and labour force quality.
- Investing in R&D, which is a major factor contributing to innovation and productivity growth, has not been the major strategy in Canadian food processing.
- Canadian food processing establishments have innovated at varying degrees, comparable to total manufacturing.
- Maintaining and improving the competitiveness and performance of the food processing industry will require incentives for ongoing investments in R&D and innovation.
- There are new opportunities emerging for the Canadian agriculture and agri-food sector from increased demand for traditional commodities from developing countries such as India. Opportunities also exist for new high value-added products in developed country markets where consumers are willing to pay more for quality attributes. Innovation can help develop these new value-added products.

The greatest opportunity to increase profitability is through productivity improvements

There are three ways to enhance profitability:

1. Through higher output prices

- ❖ As the food processing industry competes with imported goods, prices are determined at the world market, and so the scope for a small country to influence is limited
- ❖ Trade reform may have some impact
- ❖ Higher-priced value-added products may provide some important opportunities in the future

2. Through lower input prices

- ❖ Limited influence since many are set in global markets or set outside agriculture
 - Regulations can have an impact on input prices

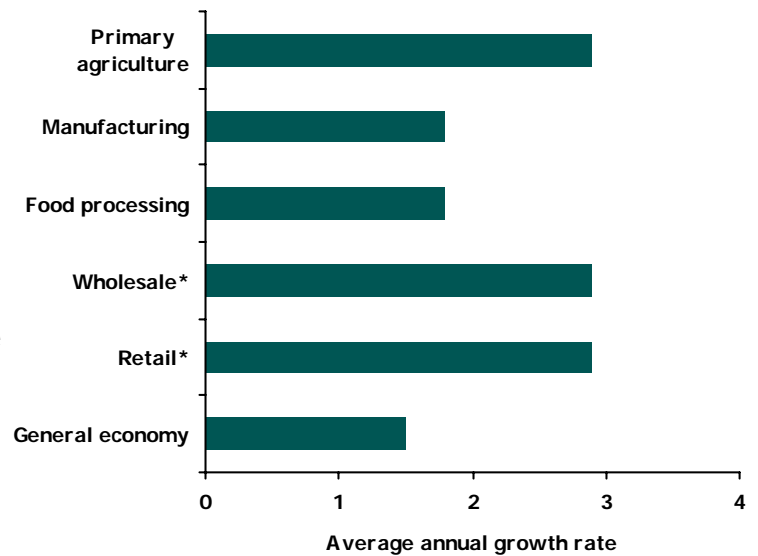
3. Through productivity growth

- ❖ Potential for major gains by enhancing structural change and innovation through
 - Enhancing private and public sector spending on R&D and investment in public infrastructure
 - Removing regulatory impediments
 - Developing new products that meet changing consumer and market demands

Canada's agri-food industry has experienced strong productivity growth in the past

- Productivity growth and technological change have contributed to the competitiveness of the Canadian food processing industry.
- Multifactor productivity growth in food processing has been more in line with other sectors, such as total manufacturing, at 1.8% a year between 1997 and 2003.
- However, it has been below rates of productivity growth in primary agriculture and retailing.

Chart 50
Multifactor productivity growth**
in the Agriculture and Agri-Food system
(1997-2003)



* Includes both food and non-food.

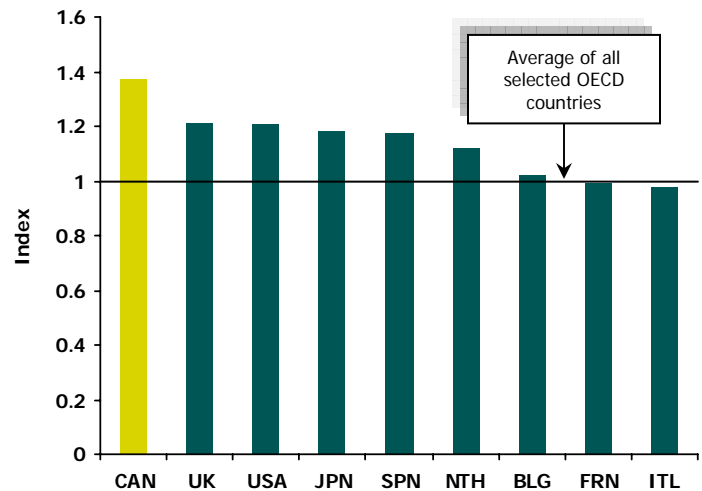
**MFP or total factor productivity measures the ratio of output produced per combined bundle of all inputs.

Source: An Overview of the Canadian Agriculture and Agri-Food System, 2006.

The Canadian food processing sector has outperformed other OECD countries in terms of productivity

- Total factor productivity in food, drink and tobacco manufacturing in Canada is 37% higher than the average of major competitors from OECD countries.
- Over the 1992 to 2002 period, however, productivity growth in Canada has declined by 0.01% compared to the UK and the Netherlands, where positive growth has occurred.
- In the U.S. it declined by 0.02% over this period.

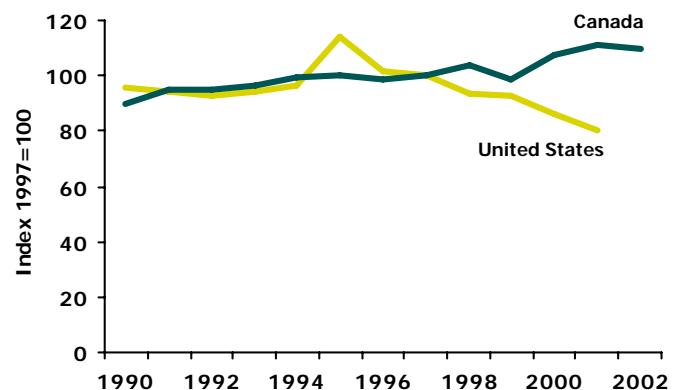
Chart 51
Total factor productivity in food, drink and tobacco, by country (1992-2002)



Source: SKDA. Sector Matter: An international Study of Sector Skills and Productivity by Nick Jaager (IES), Lionel Nesta (SPRU), Vania Gerova (IES), Parimal Patel (SPRU).

- Canada's labour productivity in food processing has grown compared to the U.S. since 1997.
- In food and beverage processing, labour productivity grew 9% in Canada but declined in the U.S. between 1996 and 2002.

Chart 52
Labor productivity for the food, beverage and tobacco industry* (1990-2002)



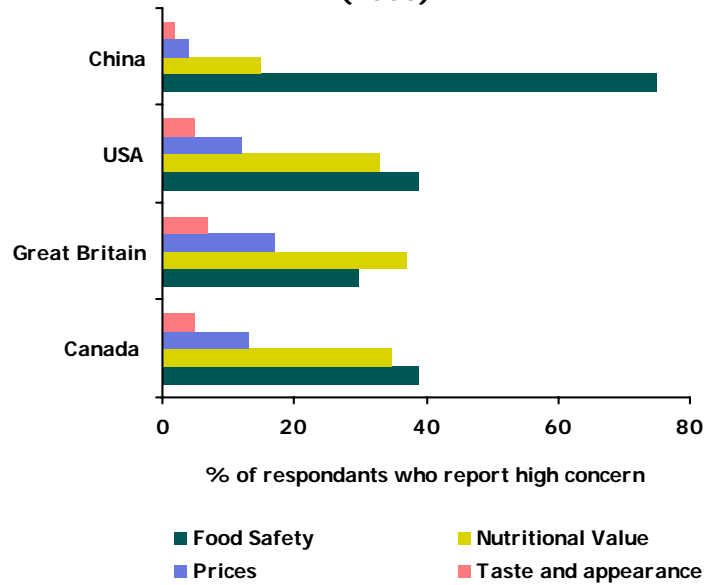
*Value-added per worker.

Source: OECD STAN Indicators, 2004 and AAFC.

But staying ahead will require continued innovation and adaptation to changing market conditions such as from opportunities that are arising from consumer demands for quality attributes

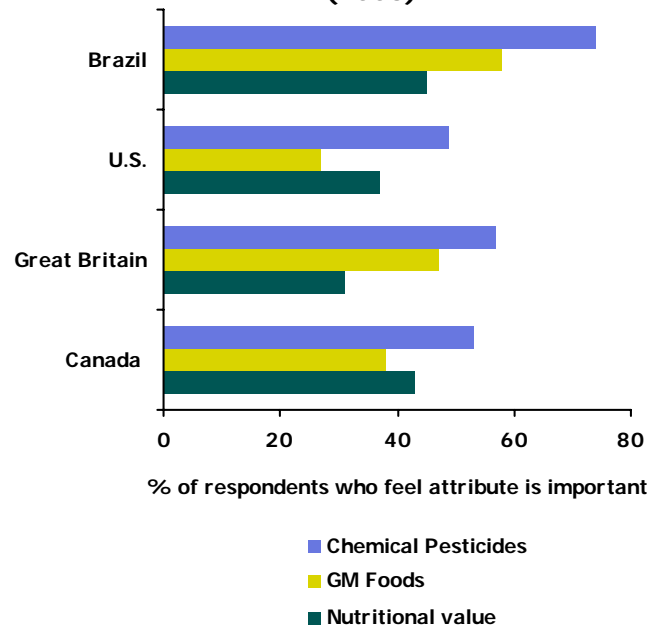
- Food safety, quality and other food attributes are becoming increasingly important for trade and competitiveness.
- Many importing countries are developing strict standards on the safety and quality of the food they import.
- Many multinational retailers are also developing private standards on food safety, quality and other food attributes.
- An increasing number of consumers throughout the world place importance in food safety and quality above price.
- Many consumers are seeking food quality attributes such as organics, non-GMO, nutritional, healthy and environmentally-friendly products.
- Opportunities are also arising from new technologies that create new uses for commodities especially in the area of functional foods and nutraceuticals, bioproducts, etc.

Chart 53
Food issues of concern (2003)



Source: Globescan 2003.

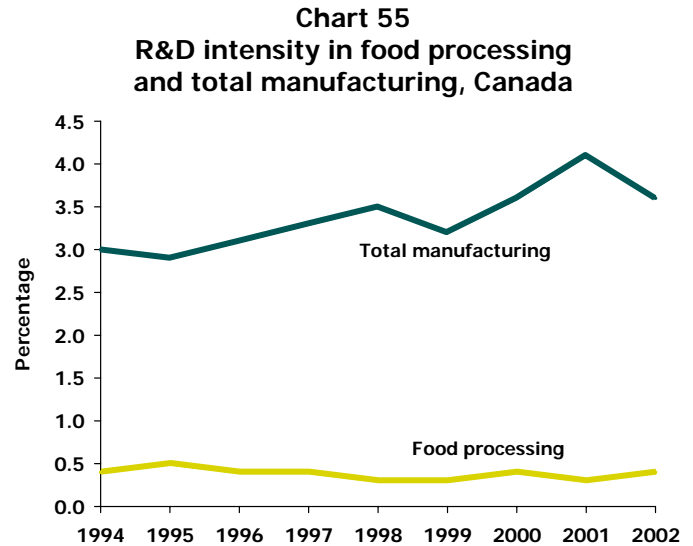
Chart 54
Importance of various food attributes by country (2003)



Source: Globescan 2003.

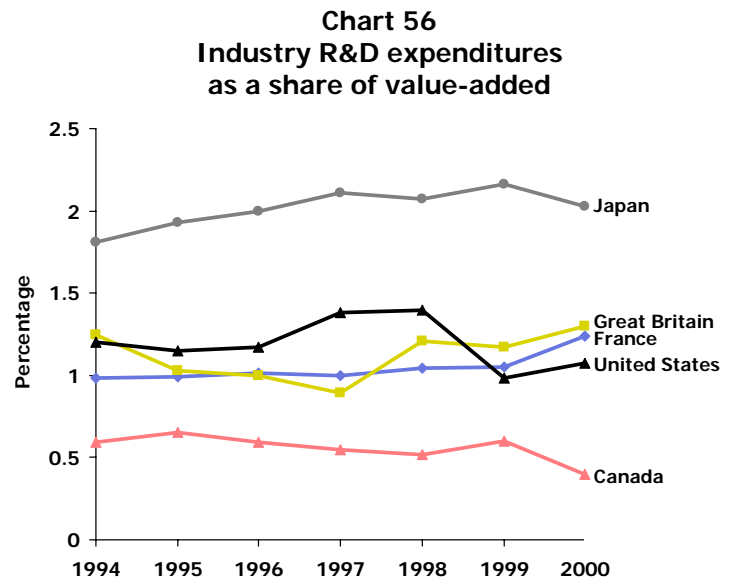
Investing in R&D, which is a major factor contributing to innovation and productivity growth, has not been the major strategy in food processing in Canada

- Private sector investment in R&D in the food processing sector is lower than in total manufacturing, when measured as a share of value-added.



Source: Statistics Canada, R&D in Canadian Industry Survey.

- OECD data show that private sector R&D spending in food, beverage and tobacco processing as a share of value-added was generally lower in Canada compared to the other major developed countries.
- This may reflect the fact that R&D has been conducted by food processing parent companies, located outside Canada, leading to technological transfer through Foreign Direct Investment.
- Investing in public infrastructure is proven to benefit productivity growth: studies show that for every dollar spent on public infrastructure, productivity in food processing alone went up by \$0.03 (dollars) (Harchaoui T.M. and Tarkhani F., 2003).



Source: OECD, DSTI, STAN Indicators, 2004.

Canadian food processing establishments have innovated at varying degrees, comparable to total manufacturing

- The Innovation in Food Processing Survey found that:
 - ❖ 37% of establishments introduced product innovation; of these 55% developed completely new products.
 - ❖ 23% of establishments introduced process innovation; of these 68% significantly adapted, improved or modified existing technologies.
 - ❖ These are comparable with what was observed in Australia, where 33% and 29% of food, beverage and tobacco manufacturing establishments undertook product and process innovations respectively in 2001.
 - ❖ These are also comparable to the extent of innovation in total manufacturing in Canada.
 - ❖ Companies that invest in R&D are the ones that also innovate.
- Recent examples of innovation in food processing include bagged lettuce, baby-cut carrots, flash-freezing and chilled pork for the Japanese market.

Maintaining and improving the competitiveness and performance of the food processing industry will require incentives for ongoing investments in R&D and innovation

- According to the Innovation Survey, lack of internal capital is the greatest impediment to innovation.
- R&D tax credits and grants are the most important government support program for R&D and innovation.
- Other important factors that may impede innovation include inflexible regulations or standards and lack of skilled workers.

Chart 57
Major factors impeding innovation in the Canadian food processing industry

FACTOR	% OF INNOVATING ESTABLISHMENTS INDICATING MEDIUM OR HIGH IMPORTANCE
Lack of internally generated cash flow	42.2
Long gestation period of innovation	37.4
Insufficient flexibility in regulations or standards	37.4
Shortages of skilled workers	37.1
Lack of marketing capability	36.3
Lack of retail acceptance or access to distribution channels	29.1
Lack of external equity funding	26.0
Lack of debt financing	25.2
Lack of idea champions	24.1
Corporate/management resistance to innovation	15.8
Difficulty in negotiating clear intellectual property (IP)	9.3

Source: AAFC, The Nature and Extent of Innovation in the Canadian Food Processing Industry.

To overcome some of the impediments, Canadian food processing establishments use different strategies to innovate

- A large percentage of innovating establishments use government programs such as R&D tax credits and grants to overcome lack of internal capital for innovation.
- Other programs utilized by processing establishments include government supported training programs, government financing support, government research facilities and export development assistance.

Chart 58
Use and importance of government support and programs for innovation

SOURCE OF SUPPORT	USE	MEDIUM OR HIGH IMPORTANCE
	% OF INNOVATING ESTABLISHMENTS	
R&D tax credits	68.6	44.0
Government R&D grants	42.6	20.6
Government-supported training programs	40.8	12.9
Government financing support	38.5	17.4
Government research facilities	36.0	12.4
Export development assistance	32.7	8.5

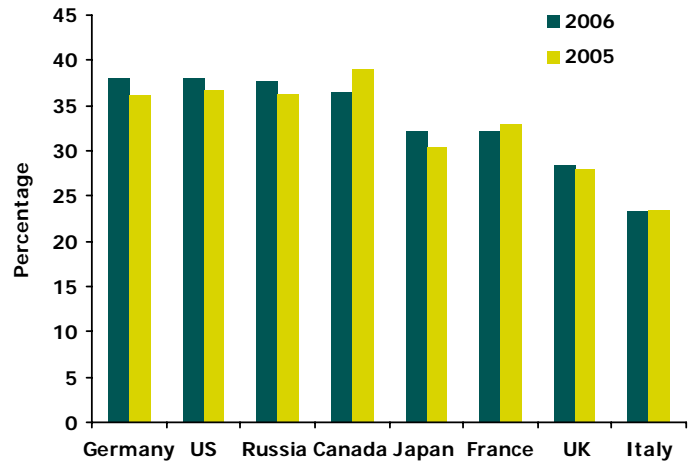
Source: AAFC, The Nature and Extent of Innovation in the Canadian Food Processing Industry.

- Food processors also collaborate with other members of the supply chain particularly with food ingredient suppliers, packaging suppliers and equipment suppliers to overcome impediments to innovation.

The food processing sector is also challenged by the business climate, skills and human capital

- Corporate tax rates play a significant role in determining capital investments.
- Countries that enjoy high economic growth rates such as Ireland, Singapore and Hong Kong are also countries with very low effective tax rates.
- Canada's effective tax rate on capital was the highest in 2005 and the 4th highest among G8 countries in 2006.

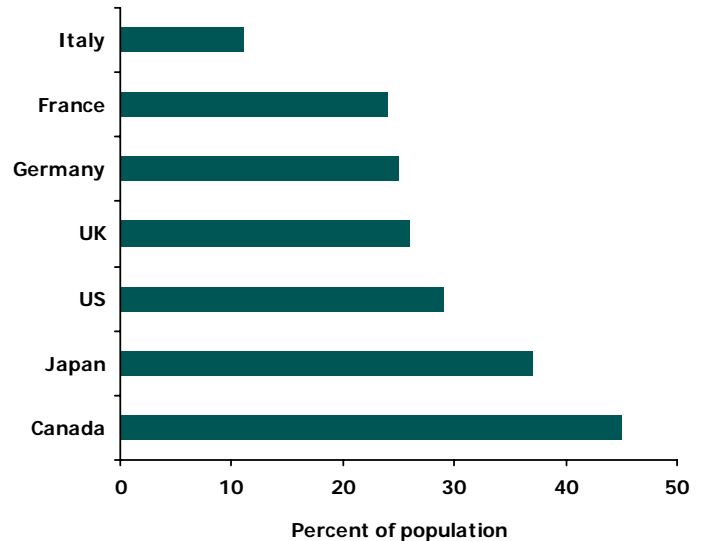
Chart 59
Effective tax rates, G8 countries



*Effective tax rates reflect the combined effects of all business taxes.
Source: Mintz (2006).

- Human capital is critical for improved productivity.
- According to the C.D. Howe Institute, human capital helps facilitate the diffusion of innovation outputs (Robson and Goldfarb, 2006).
- Canada has one of the most highly educated work forces in the world with the highest proportion of the population aged 25-64 with university and college education.
- However, many food processing establishments report shortages of skilled workers indicating that the skills of the workforce do not match what is required in food processing.
- Federal regulations for unskilled migrant labour restricts work permits to a year duration with serious implications for meat packing for example.

Chart 60
Population with tertiary education (2004)

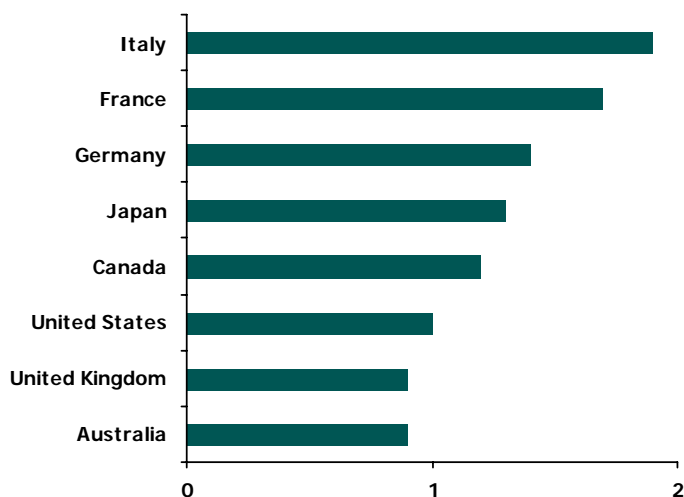


Source: OECD, Education in a Glance, 2006.

An effective regulatory environment is necessary for the creation of efficient markets which are necessary for the success of the food processing industry

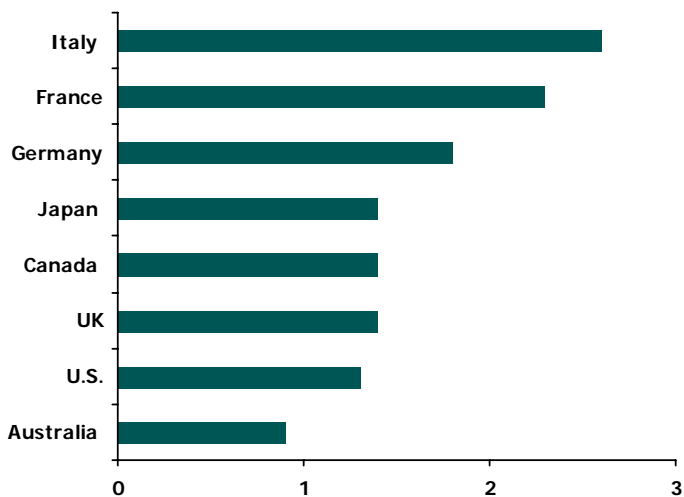
- Greater access to the market allows Canadian firms to specialize and benefit from economies of scale. For example, food processing exports have increased since the mid-1990s, due to NAFTA (Doan et al., January 2005).
- However, according to recent surveys, impediments in the markets are created by the high cost and timeliness of regulations, insufficient flexibility in regulations or standards and a lack of marketing capacity (AAFC, Innovation in Food Processing, 2006).
- According to a report by Doering (2005), the Food and Drug Act regulatory system undermines competition and innovation in food processing because of the long delays in receiving approvals. For example, submissions for new food additives typically takes 3-5 years for approval.
- The OECD has developed a series of product market regulations and economic regulations indices for OECD countries which use indicators of the extent of public ownership, involvement in business operations, regulatory capacity, administrative burden and barriers to trade and investment to measure a country's regulatory environment.
- According to the OECD, the domestic product market regulation index for Canada of 1.2 is lower than for other G7 countries but higher than for the U.S and the UK. This index can range from 1 for a country with a liberal regulatory environment to 6 for a highly restrictive regulatory environment.

Chart 61
Domestic product market regulations index for G7 countries (2003)



Source: OECD, Product Market Regulation Index, 2003.

Chart 62
Economic regulations index for G7 countries (2003)



Source: OECD, Product Market Regulation Index, 2003.

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