

**Understanding the Ontario
Food and Beverage
Manufacturing Industry:
Challenges and Opportunities**

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Executive summary

This white paper provides an overview of the food and beverage manufacturing sector in Ontario. The specific objectives of the study are to:

- Identify factors that influence investment, competitiveness, employment and productivity in Ontario's food and beverage manufacturing sector;
- Conduct a comprehensive review of data inventory and data sources useful in conducting business and economic research in the food and beverage manufacturing industry; and
- Identify gaps in available data and find appropriate ways to collect or acquire data necessary to study food and beverage related issues.

The food and beverage manufacturing sector is an economically important sector in Ontario and Canada. The sector contributed \$13.1 billion to Ontario's GDP in 2016 (or about 2%). Furthermore, the food and beverage manufacturing sector is the second largest manufacturing sector in Ontario, accounting for 16% of Ontario's manufacturing GDP. The food and beverage manufacturing sector is also the second largest employer in Ontario. In 2016, it employed 91,575 jobs, or 1.3% of all jobs in Ontario. The sector accounts for 13% of manufacturing jobs in Ontario. Ontario is the largest contributor to the national food and beverage manufacturing sales. In 2017, Ontario shipped 42% of the food and beverage manufacturing output, Quebec 25%, Alberta 9%, Manitoba 4%, Saskatchewan 4%, Nova Scotia 2% and British Columbia 9% of national shipments.

Trade remains important to the food and beverage sector. The United States remains Canada's largest trade partner accounting for 73% of food manufacturing exports and 64% of imports. Ontario accounts for more than one third of food and beverage manufacturing jobs in the country. Alberta, Saskatchewan and Quebec have a positive trade balance. Ontario and British Columbia have a negative trade balance. Ontario has the highest food and beverage manufacturing imports and exports.

Despite its contributions to the economy, the sector faces certain challenges and opportunities. For example, according to Statistics Canada's Survey of Innovation and Business Strategy, firms perceive regulatory issues, risk and uncertainty to be the main barriers to product development and process innovation. This includes changing market requirements (e.g., entry into or exit from free trade agreements like NAFTA, TTP, CETA, CKFTA, CPTPP); non-tariff barriers, the nature of food safety regulations and their implication for compliance costs and competitiveness and GMO labelling. GMO labelling is mandatory in Europe and has huge implications for trade considering the newly negotiated Comprehensive Economic and Trade Agreement (CETA).

The emergence of low-cost competitors (e.g., the BRICS countries) may create a threat to the growth of the industry. The Statistics Canada Survey of Innovation and Business Strategy illustrates that food and beverage manufacturers are facing fierce competition. Most of the surveyed companies reported having 4 to 10 competitors and over 20 competitors for their highest selling product.

On the input side, concerns related to access to an appropriately skilled labour force, especially education-related skills, in the manufacturing sector have grown in recent years, with a series of reports from employer-associated organizations but also from independent and even government

sources making similar claims. A 2017 report by the Agricultural Institute of Canada suggests there is labour shortage (especially in primary agriculture), and a shortage of commodity-specific research specialists and technicians in food and beverage processing companies. The literature suggests that there is lack of staff skilled in database design and computer programming. According to a recent “Planning for Tomorrow 2.0” report commissioned by Ontario Agricultural College, 51% of food employers surveyed and 67% of agriculture employers surveyed reported difficulties in finding recruits. The report noted that “... 44% of food employers and 56% of agriculture employers surveyed, project a general increase in the average number of new hires over the next five years.” The Conference Board of Canada estimates indicate that skills gaps cost the Ontario economy up to \$24.3 billion in foregone GDP and \$4.4 billion in federal tax revenues and \$3.7 billion in provincial tax revenues. On the demand side, consumers are seeking food with certain attributes that go beyond the basic nutritional benefits to enhance general well-being and even disease prevention based on choice or necessity.

To examine issues in the food and beverage sector, we documented publicly available data and identified confidential data that can only be accessed through Statistics Canada in Ottawa. Statistics Canada collects and disseminates (aggregate) information about organizational and economic characteristics of Canadian based industry groups but not individual firms. The Statistics Act prohibits Statistics Canada from releasing any information that could identify any person, business or organization. For this reason, Statistics Canada reports aggregate data in tables (formerly known as CANSIM tables). Statistics Canada data tables provide information on employment, shipments, value added, global value chains, business strategy and innovation. Data from Statistics Canada is very useful because it includes a lot of business and economic activity data and in most cases, the data is grouped according to NAICS classification. However, in other cases, (e.g., supply and disposition tables and trade data) the data is only available for individual commodities (i.e., not grouped into NAICS classification). At a micro level, the Annual Survey of Manufacturers (ASM) is an example of data that can be accessed at Statistics Canada. The ASM collects microdata on statistics such as shipments, employment, salaries and wages, costs of materials and supplies used, cost of purchased fuel and electricity used, inventories, goods purchased for resale, and commodity data. Researchers can access establishment and firm level microdata by following the application procedures developed by Statistics Canada. The Canadian Centre for Data Development and Economic Research (CDER) manages microdata that is collected using surveys and/or other instruments.

One of the major challenges in accessing data for research is ownership that is tied to commercial sensitivity of sharing data. Companies that own data may not be willing to share their data because competitors can use it to compete against them. This is unfortunate for researchers because they lose the opportunity of gaining insights from analyzing the data and to measure the impact of government policies on the market, or companies’ business policies. Legal constraints on privacy is another issue. Data can capture large amounts of personal or commercially sensitive information. To safeguard companies, Statistics Canada provides information in anonymized or aggregate forms to prevent misuse. Identifying a mechanism for obtaining data through Public-Private Partnerships is essential to adequately study economic activities associated with food and beverage sector. Public-Private Partnerships (PPPs) may ensure a more efficient and sustainable provision of infrastructure to support research projects. To this end, we aim to work with public sector agencies and private institutions to identify and address high-priority needs for research, training and outreach.

Select Research Questions

1. Productivity and Competitiveness

- Are Canadian firms competitive in a global marketplace? What is their degree of competitiveness?
- What is the degree of productivity dispersion in the sector and what are its implications for competitiveness?
- What is the persistence of the growth in productivity in the food manufacturing industry?
- What is the relationship between exchange rate and productivity?
- What determines firms' entry and exit into the industry? Entry and exit into the international marketplace?
- What is the technological gap?
- Does size matter? What is the size distribution of firms?

2. Manufacturing Employment

- Why is employment declining in food and beverage manufacturing industries?
- Are there wage differences within provinces?
- What do we know about skills gaps?
- What is the effect of minimum wage regulation on employment and the competitiveness of the food and beverage industry?
- Does food and beverage manufacturing face a skills gap limiting growth and competitiveness?
- Is academic/education attainment a good proxy for occupational skills?
- How do we define and measure the set of skills?
- What are the skills that production workers need to help manufacturers thrive?
- What are the sources of job growth and destruction and how have salaries evolved?
- Does automation have a negative or positive impact on labour demand?
- What knowledge gaps limit growth and expansion of the market?
- What are the dynamics of adjustment as firms substitute capital for labour?

3. Merger and Acquisition

- Does Merger & Acquisition activity increase market power or firm efficiency?
- What effect do mergers have on agriculture (the main supplying sector of the food processing industry)?
- What is the effect of foreign ownership on Canadian firms?
- What factors affect firms' exit and entry in the food manufacturing industry?
- What is the effect of retail and wholesale concentration on the performance of food manufacturing?
- How competitive is Ontario in attracting food and beverage manufacturing firms compared to other provinces?

4. Innovation, Investment and Technology

- What is innovation?

- How to measure innovation activities (e.g., R&D, patents, number of innovations)?
How to measure product, process and business model innovations?
 - Does R&D activities translate to innovation?
 - Does product innovation improve firm performance (e.g., productivity, profitability)?
Does process innovation improve firm performance?
 - Does innovation have an impact on employment growth?
 - What firm-level micro economic data and econometric techniques can be used to assess the relationship between innovation and employment growth?
 - What is the level of Government investment in innovation in the sector?
 - What is the extent of automation and robotics in the food industry?
 - What is the extent of the use of ITC in the food manufacturing industry?
 - What is the extent of the use of RFID and Blockchains in the food industry for activities such as inventory management, supply chain management?
 - What are the drivers of firm investment behavior?
5. Foreign Direct Investment
- What is the level of foreign direct investment in food and beverage manufacturing industry? Does FDI vary by sub-sector? Does FDI vary by firm size?
 - What is the level of FDI compared to other jurisdictions?
 - What factors drive investment?
6. Government Programs
- How to measure/assess the impact of government programs
 - What is the effect of Government programs such as education and worker training, tax credits?
 - How to assess the impact of government investment in innovation? How do government innovation policies affect the level of private innovation?
 - What is the impact of environmental regulations (e.g., cap-and-trade) on the competitiveness of the food and beverage sector?
 - In what ways can universities and federal agencies collaborate to improve reporting in other segments of food and agricultural industries?
 - Do government programs crowd-in or crowd-out investment?
7. Value of Shipments
- What do year-to-year fluctuations in monetary value of shipments mean?
 - Are we measuring commodity price volatility or exchange rate fluctuation, increases in input costs, tight labor markets, competition, structural change (entrance of new retailers, expansion of existing retailers and closure and merger of processing establishments)? A base year in real values is used to account for inflation.
8. Trade
- What are the characteristics of firms involved in export markets?
 - What percentage of the firms are involved in export markets in each of the ten food and beverage manufacturing industries?

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Chapter 1: An Overview of the Canadian/Ontario Food and Beverage Manufacturing Industry.

1.0 Overview of the Agriculture and Agri-Food System

The agriculture and agri-food system includes input and service supplies, primary producers, food and beverage processors, food retailers and wholesalers, and food service and food service providers (AAFC, 2016). In 2016, the agriculture and agri-food system generated \$111.9 billion accounting for 6.7% of Canada's GDP. The food retail and wholesale industry, and food, beverage and tobacco industry are the largest contributors to GDP accounting for 1.8% and 1.7% respectively (AAFC, 2017).

The agriculture and agri-food system was the second largest employer in 2016. It employed 2.3 million people, representing 12.5% of Canadian employment (AAFC, 2017). Primary agriculture and food and beverage processing industries have tended to show higher job vacancy rates than other industries. To help meet labour needs, there has been strong growth in the use of temporary foreign workers (AAFC, 2017).

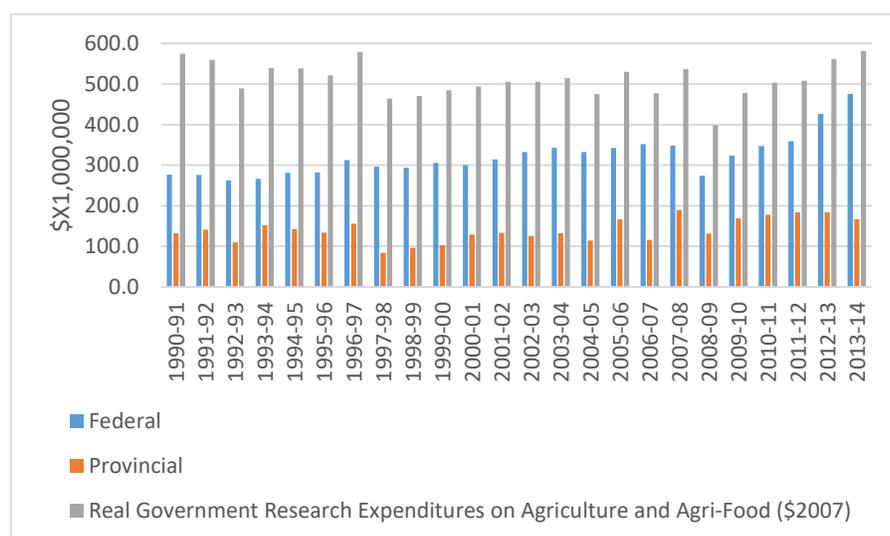
In 2016, agriculture and agri-food exports reached \$56.0 billion (or \$62.6 billion with the inclusion of seafood). In 2016, Canada's share of world agriculture and agri-food exports was 3.5%. Canada is the fifth largest exporter after the European Union, the United States, Brazil and China. An estimated 58% of the value of primary agriculture is exported as either primary commodities or processed food and beverage products (AAFC, 2016). The U.S. is Canada's most important trade partner accounting for 53.0% of exports, followed by China 10.9%.

Canada's share of world agriculture and agri-food imports was 2.8% in 2016. Canada is the world's fifth largest importer of agriculture and agri-food products. The United States accounted for 59.6% of Canada's imports (AAFC, 2016). Approximately 50% of raw agricultural products are used as material inputs by the food and beverage processing industry (AAFC, 2016).

The federal and provincial government spent \$5.4 billion in 2016/2017 in support of the agriculture and agri-food system in program payments and safety and control measures. This accounts for 24.2% of Canada's agricultural GDP (AAFC, 2017). Federal and provincial governments also support innovation and productivity growth through expenditure in research and development efforts. Federal and provincial government investment in research decreased from \$649.5 million in 2015/2016 to \$557 million in 2016/2017 (AAFC, 2017).

Figure 1.1 illustrates that federal government expenditure on R&D is higher than provincial government expenditure. Data used in Figure 1.1 was obtained from Agriculture and Agri-Food Canada.

Figure 1.1 Federal and Provincial R&D Expenditure (X\$1,000,000)



Source: AAFC correspondence December 2016

1.1 The Manufacturing Industry Overview

In 2017, manufacturing accounted for \$179.9 billion of GDP, which is 10.3% of national GDP (Statistics Canada, 2018). Manufacturing accounts for 1.60 million full-time jobs and represents 8.5% of total national employment (Statistics Canada, 2018). Table 1.1 shows NAICS classification of manufacturing industries.

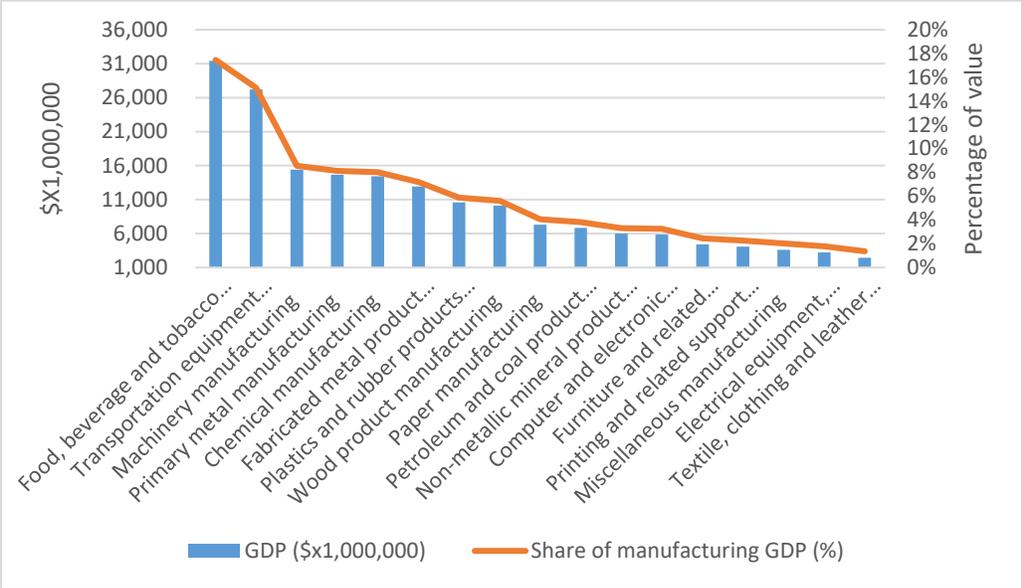
Table 1.1 Manufacturing Industry 3-digit NAICS Classification

NAICS code	Manufacturing sub-sector
311 & 312	Food, beverage and tobacco manufacturing
313 & 314	Textile and textile product mills
315 & 316	Clothing and leather and allied product manufacturing
321	Wood product manufacturing
322	Paper manufacturing
323	Printing and related support activities
324	Petroleum and coal product manufacturing
325	Chemical manufacturing
326	Plastics and rubber products manufacturing
331	Primary metal manufacturing
332	Fabricated metal product manufacturing
333	Machinery manufacturing
334	Computer and electronic product manufacturing
335	Electrical equipment, appliance and components manufacturing
336	Transportation equipment manufacturing
337	Furniture and related product manufacturing
339	Miscellaneous manufacturing

Source: Statistics Canada 2017

Food and beverage manufacturing and transport equipment manufacturing are the largest manufacturing employers. Food and beverage manufacturing and transport equipment manufacturing represent 16.3% and 13.5% respectively of total manufacturing employment (no other manufacturing sector contributes more than 11% to employment). In 2017, manufacturing exports were worth \$360.7 billion (which is 66% of national exports) while imports were worth \$496.3 billion (Innovation, Science and Economic Development Canada, 2018).

Figure 1.2 Manufacturing Industry GDP Canadian by Sector 2017 (X\$1,000,000)



Source: Statistics Canada Table 36-10-0434-01 (formerly CANSIM 379-0031)

Note: Secondary axis represents each sub-sector’s share of manufacturing GDP in 2017

1.2 Introduction: The Food and Beverage Manufacturing Industry

Food and beverage manufacturing is comprised of establishments involved in processing raw food materials, packaging and distributing them. This includes fresh prepared food and alcoholic and non-alcoholic beverages (U.S. Commercial Services, 2016). Data for profiling food and beverage manufacturing was obtained from Statistics Canada, the data is classified under the North American Industry Classification System (NAICS). The North American Industry Classification System was developed in the 1990s by statistical agencies of Canada, United States and Mexico to provide a common framework for analyzing data relating to industry and the economy (Statistics Canada, 2016). NAICS has a hierarchical structure dividing the economy into 20 sectors. NAICS is a production-oriented industry classification system designed to support the standard measurement of inputs and outputs, industrial performance, productivity, unit labour costs and employment that reflect structural changes (Statistics Canada, 2016). Table 1.2 illustrates the ten food and beverage manufacturing industries.

Table 1.2 Food and Beverage Industry Contribution to Canada Shipments and Jobs 4-digit NAICS Classification

NAICS code	Industry Group	Contribution to food and beverage industry shipments 2017 (%)	Contribution to food and beverage industry jobs 2016 (%)
3111	Animal Food Manufacturing	6.9%	4.9%
3112	Grain and Oilseed Milling	9.7%	2.7%
3113	Sugar and Confectionery Product Manufacturing	3.2%	4.3%
3114	Fruit and Vegetable Preserving and Specialty Food	6.8%	7.1%
3115	Dairy Product Manufacturing	13.2%	9.1%
3116	Meat Product Manufacturing	25.1%	20.8%
3117	Seafood Product Preparation and Packaging	5.0%	7.8%
3118	Bakeries and Tortilla Manufacturing	8.7%	17.1%
3119	Other Food Manufacturing	9.7%	11.8%
3121	Beverage Manufacturing	9.9%	14.3%

Source: Statistics Canada 2017 CANSIM table 304-0014 and 383-0031 and personal calculations

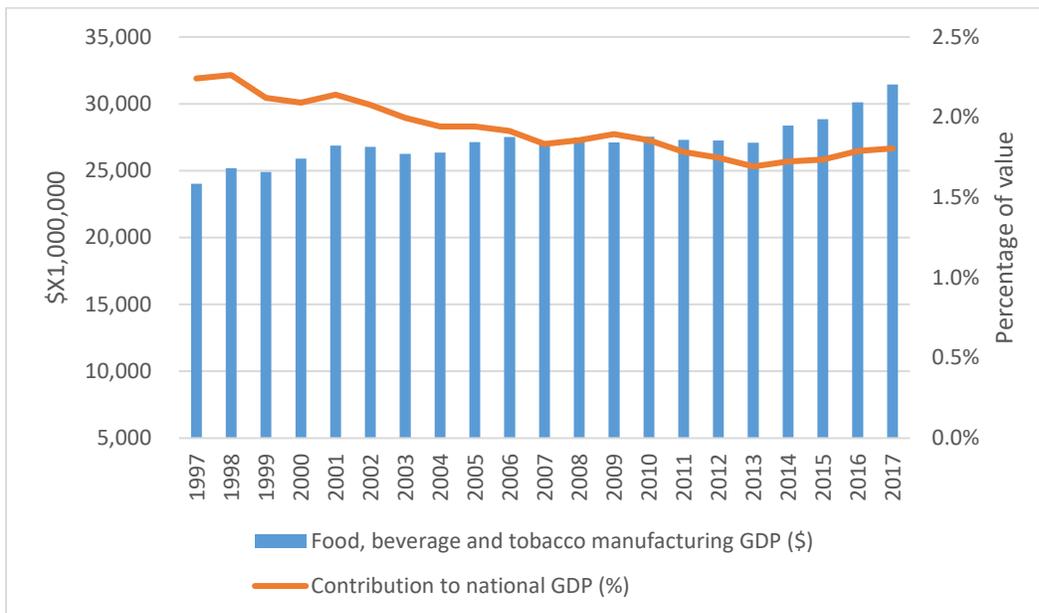
The aim of this study is to:

- identify factors driving investment, employment, competitiveness and productivity in food and beverage manufacturing;
- identify data availability for the food and beverage manufacturing industry research and business analytics;
- catalogue sources of data the university has public access to; and
- identify gaps in data and suggest appropriate ways to collect or acquire more data.

1.3 Food and Beverage Manufacturing Contribution to the Canadian Economy (GDP)

In 2017, food, beverage and tobacco manufacturing generated \$31.6 billion, which accounts for 1.8% of total national GDP (Figure 1.3). Food and beverage manufacturing was the largest manufacturing sub-sector accounting for 17.6% of manufacturing GDP. Meat product manufacturing and beverage and tobacco product manufacturing are the largest food and beverage manufacturing sub-industries accounting for 3.5% and 3.3% respectively, of manufacturing GDP. Other food manufacturing accounts for 2.2%, bakery and tortilla manufacturing accounts for 1.7%, dairy product manufacturing accounts for 1.7%, grain and oil milling 1.5% and fruit and vegetable preserving and specialty food accounts for 1.4%.

Figure 1.3 Canada Food, Beverage and Tobacco Manufacturing GDP (X\$1,000,000)



Source: Statistics Canada Table 36-10-0434-01 (formerly CANSIM 379-0031)

Note: The secondary axis represents year to year contribution to national GDP

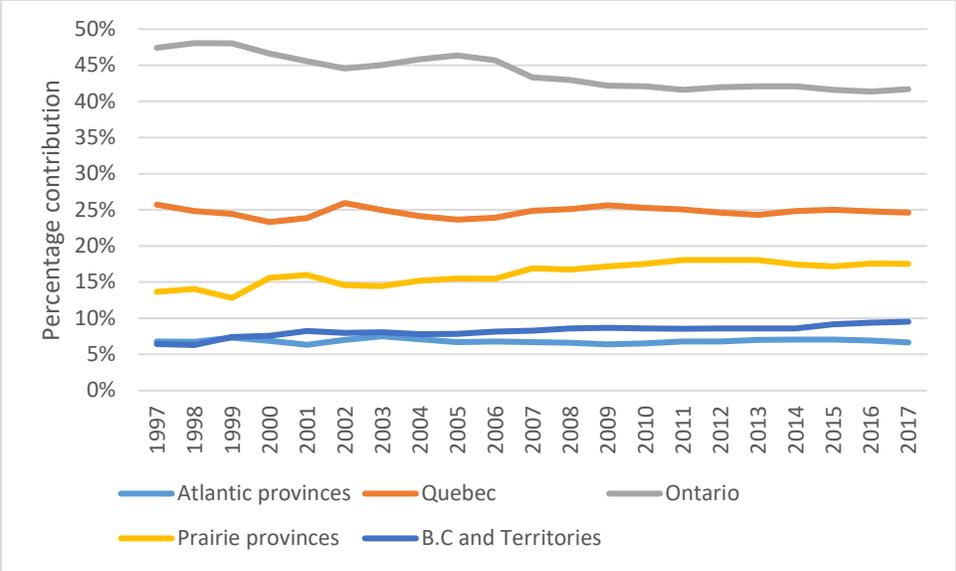
Food and beverage manufacturing has lost GDP share, in 1997 food and beverage manufacturing accounted for 2.2% of national GDP whereas in 2017 it only accounted for 1.8% of GDP. A 2012 report by Statistics Canada states that the decline in manufacturing’s share of the value of economic activity does not necessarily imply that manufacturing itself is in decline. It could be a result of other areas of the economy expanding more rapidly or society valuing services like construction, financial services and professional, scientific and technical services more than manufactured products (Statistics Canada, 2012).

1.3.1 Food and Beverage Manufacturing Contribution to the Economy of Ontario (GDP)

In 2017, Ontario accounted for 42% of total national food and beverage manufacturing GDP. This illustrates that Ontario has an important role in the food and beverage manufacturing industry. However, Ontario’s food and beverage manufacturing sector has lost market share, in 1997 Ontario food and beverage manufacturing accounted for 47% of total national food and beverage manufacturing GDP compared to 42% in 2017 (refer to Figure 1.4). While Ontario GDP has experienced a decrease in market share, some provinces including the Prairies (Alberta, Saskatchewan, and Manitoba), British Columbia and the Territories (Yukon, Nunavut and North Western Territories) have experienced an increase in market share. For instance, the market

share for British Columbia and Territories increased from 6% in 1997 to 10% in 2016. Similarly, the market share for the Prairies increased from 14% in 1997 to 18% in 2016. The market share for Quebec and the Atlantic provinces (New Brunswick, Newfoundland, Nova Scotia and Prince Edward Island) has remained stable.

Figure 1.4 Food, Beverage and Tobacco Manufacturing Contribution to National GDP by Region or Province



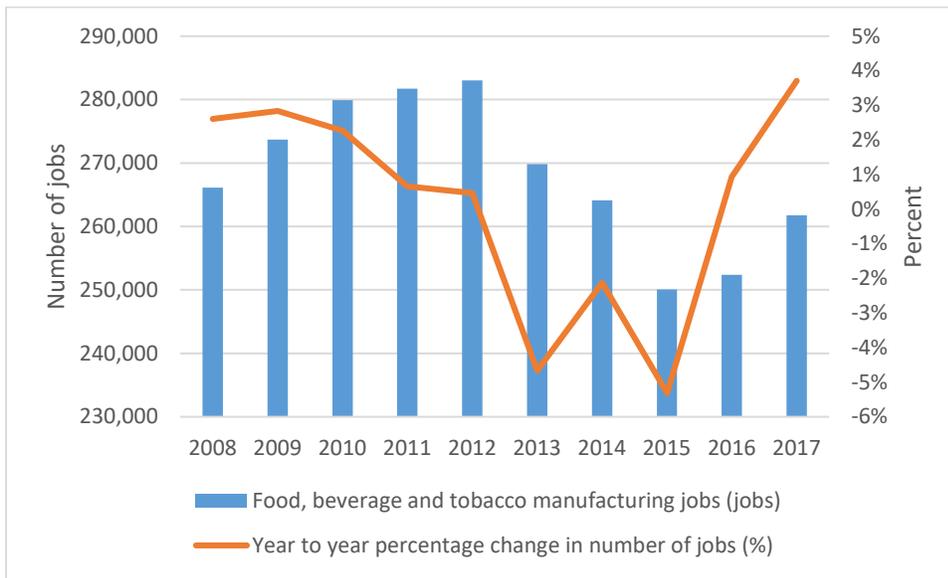
Source: Statistics Canada Table 36-10-0402-01 (formerly CANSIM 379-0030) and personal calculations

In 2017, Ontario’s food, beverage and tobacco manufacturing sub-sector generated \$13.1 billion GDP accounting for 2% of total Ontario GDP. Food and beverage manufacturing was the second largest manufacturing sub-sector (transportation equipment manufacturing was the largest, accounting for 23%) accounting for 16% of Ontario manufacturing GDP.

1.4 Food and Beverage Manufacturing Jobs in Canada

In 2017, food, beverage and tobacco manufacturing accounted for 261,765 jobs representing 1.4% of total jobs in Canada. Food and beverage manufacturing is the largest manufacturing employer, it accounts for 16.3% of manufacturing jobs. The total number of jobs in food, beverage and tobacco manufacturing increased by 3.7% from 252,400 in 2016 to 261,765 in 2017 (refer to Figure 1.5). Meat product manufacturing, bakeries and tortilla manufacturing and beverage and tobacco product manufacturing are the highest employers, accounting for 22%, 17.4% and 16% respectively of food and beverage manufacturing jobs.

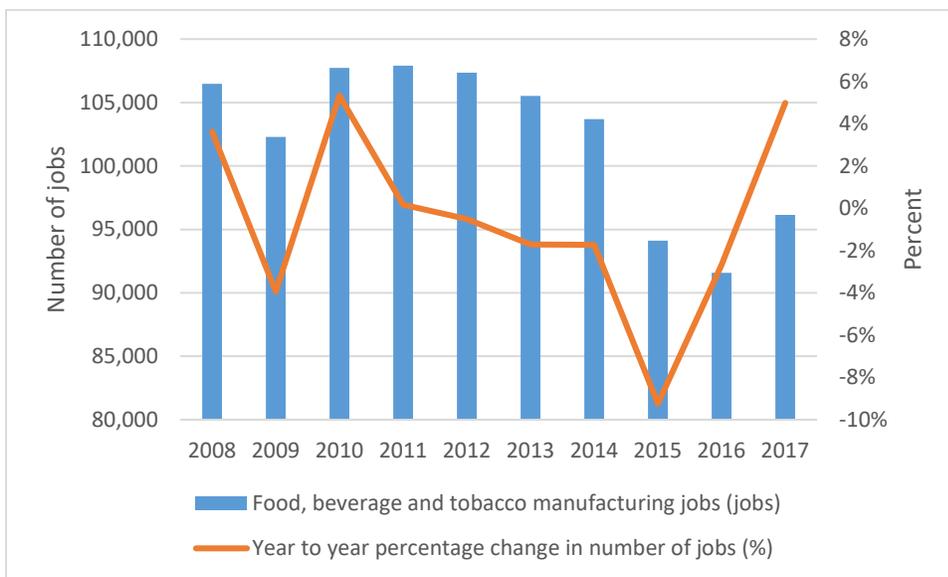
Figure 1.5 Food and Beverage Manufacturing Number of Jobs in Canada



Source: Statistics Canada Table 36-10-0489-01 (formerly CANSIM 383-0031). Note: The secondary axis on Figure 1.5 represents year to year percentage change in number of jobs from 2007 to 2016

1.4.1 Food and Beverage Manufacturing Jobs in Ontario

Figure 1.6 Food and Beverage Manufacturing Number of Jobs in Ontario



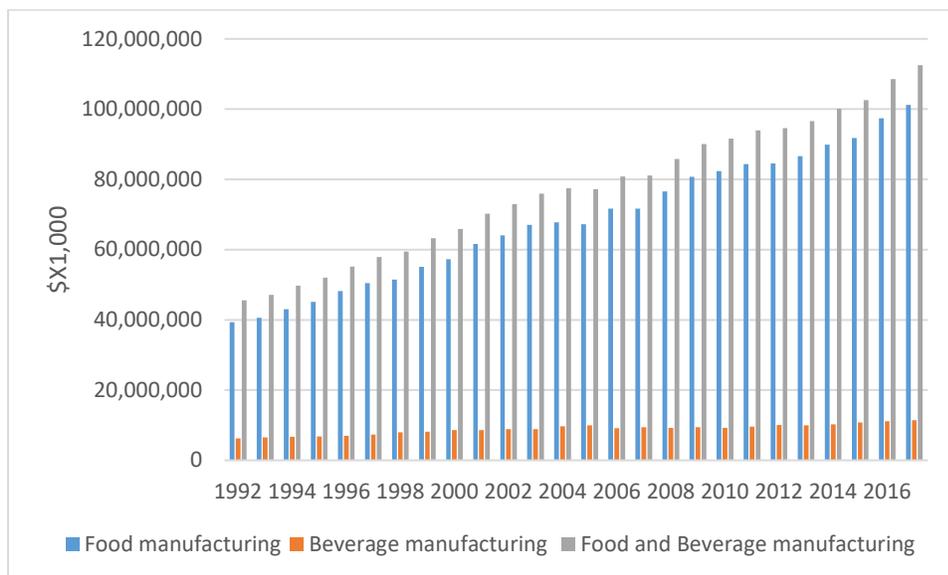
Source: Statistics Canada Table 36-10-0489-01 (formerly CANSIM 383-0031). Note: The secondary axis shows change in number of jobs from 2015 to 2016

In 2017, Ontario’s food and beverage manufacturing sub-sector accounted for 96,140 jobs representing 1.3% of all jobs in Ontario. It is the second largest manufacturing employer after transportation and equipment manufacturing (which accounts for 1.8% of all jobs in Ontario). Ontario’s food and beverage manufacturing sub-sector accounts for 13.8% of all manufacturing jobs in Ontario. The number of food and beverage manufacturing jobs increased by 5% from 91,575 in 2016 to 96,140 in 2017. Figure 1.6 illustrates that the number of jobs has been fluctuating from year to year.

1.5 Food and Beverage Sales of Goods Manufactured in Canada (Shipments)

Manufacturing shipments report the monetary value (not the quantity) of manufactured goods. In 2017, food and beverage manufacturing was the second largest manufacturing sub-sector after transport and equipment manufacturing. The combined value of shipments for food and beverage manufacturing was \$112.6 billion accounting for 17.3% of manufacturing shipments. The value of shipments has more than doubled over the decades. For example, in 1992, shipments were valued at \$45.5 billion compared to \$112.6 billion in 2017.

Figure 1.7 Canadian Food and Beverage Shipments (product value) (X\$1,000)



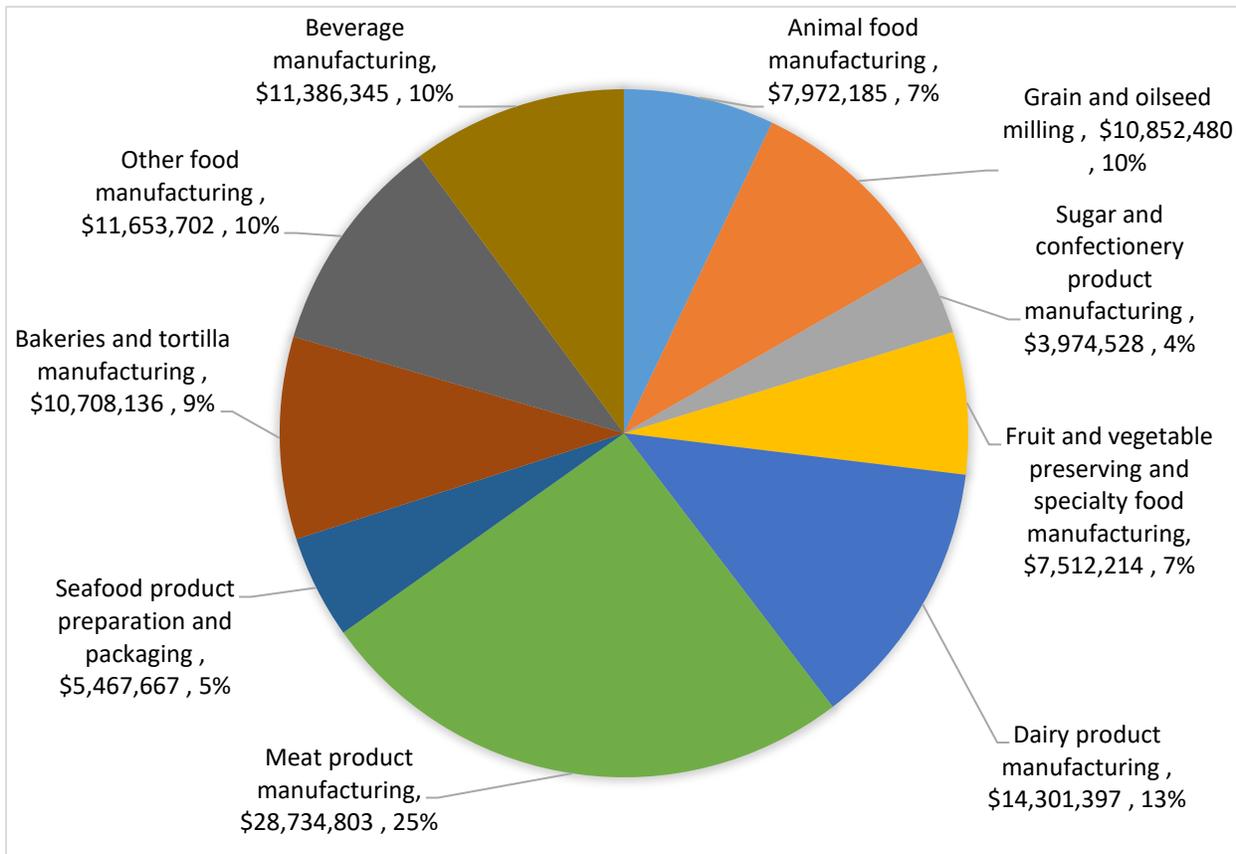
Source: Statistics Canada Table 16-10-0047-01 (formerly CANSIM 304-0014) Nominal/current

Figure 1.7 illustrates that the value of shipments has been increasing over the past decades, however, the cost of inputs such as capital, labour, energy, material and purchased services (KLEMS) has also increased substantially (and is highly volatile) over the years, subsequently affecting profit margins. Historically, energy and material prices are volatile due to seasonal

variations in supply and demand, seasonal variations in temperature, availability of inputs from surrounding regions, plant closures and deregulation measures, among others.

The top five food and beverage manufacturing industries: meat product manufacturing, dairy product manufacturing, grain and oilseed milling, other food manufacturing and beverage manufacturing accounted for approximately 60% of food and beverage manufacturing sales.

Figure 1.8 The Composition of Food and Beverage Manufacturing Shipments in Canada \$X1,000 (2017)



Source: Statistics Canada Table 16-10-0047-01 (formerly CANSIM 304-0014) Nominal/current

Statistics Canada identifies the size of manufacturing establishments by the number of people employed by the establishment. Establishments are grouped into four categories: micro (1 to 4 employees), small (5 to 99 employees), medium (100 to 499 employees) and large (more than 500 employees). The majority (91%) of food, beverage and tobacco manufacturing establishments are classified as small, 8% of establishments are classified as medium and only 1% of establishments are classified as large (Statistics Canada, 2017).

In 2016, food, beverage and tobacco manufacturing value added was \$40.6 billion, which accounts for 17.8% of total manufacturing value added. Food, beverage and tobacco

manufacturing value added increased by 7.7% from \$37.7 billion in 2015 to \$40.6 billion in 2016. Due to changes in Statistics Canada's data collection and analysis methods, we can only analyze total revenue, total expenses and manufacturing value-added data for the period 2012 to 2016. Total revenue increased by 12.7% from \$103.8 billion in 2012 to \$116.9 in 2016 whereas total expenses increased by 10.9% from \$92.9 billion in 2012 to \$103.1 billion in 2016. The data suggest that total revenue has been growing at an average annual rate of 3% while total expenses have been growing at an average annual rate of 2.6%, however, we cannot draw conclusions on profit margins because this is only five years of data. Table 16-10-0117-01 (2012 to 2016) replaced table 301-0006 (2004 to 2012), the two data sets cannot be used as time series data because of changes in data compilation and processing methods.

1.5.1 Food and Beverage Manufacturing Sales of Goods Manufactured in Ontario

Ontario's food and beverage manufacturing is the second largest manufacturing sub-sector after transport and equipment manufacturing. In 2017, the combined value of shipments for food, beverage and tobacco manufacturing was \$43.4 billion, accounting for 14% of Ontario manufacturing shipments. The top three food manufacturing industries (in Ontario), meat product manufacturing, bakeries and tortilla manufacturing and dairy product manufacturing account for 56% of Ontario food manufacturing shipments (Note: Beverage manufacturing shipment data for Ontario is suppressed/not reported).

Over the last 10 years (2008 to 2017), the monetary value of food manufacturing shipments increased by an average annual rate of 3%. The volume of goods produced, price, inflation and the exchange rate (for exports) among other factors affect the value of shipments.

The distribution of establishments in Ontario is similar to that of Canada, 91% of food and beverage manufacturing establishments are classified as small, 8% are classified as medium and only 1% are classified as large (Statistics Canada, 2017).

1.6 Manufacturing Industry Expenses

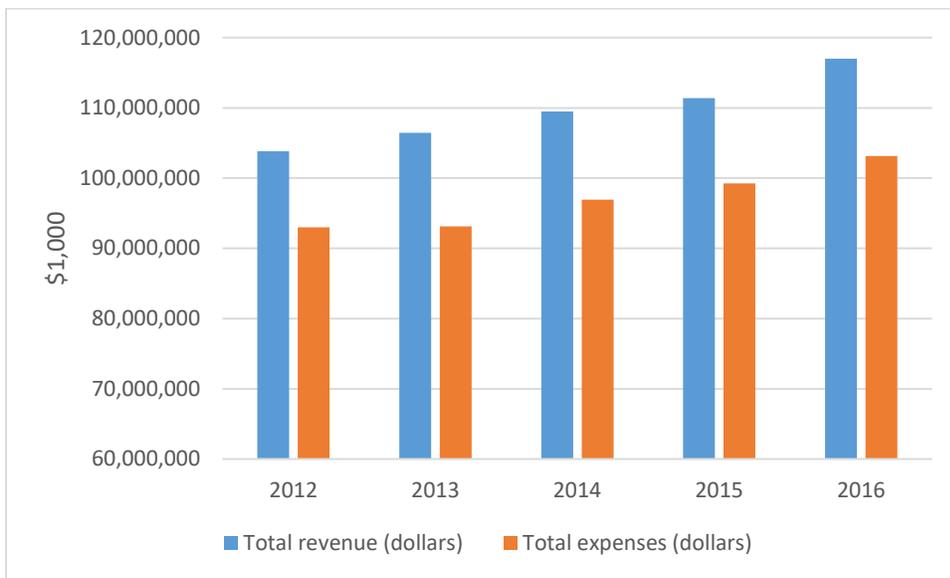
Revenue and expenditure data illustrates that both revenue and expenditure fluctuate in response to economic factors such as output price and cost of inputs and other demand and supply factors (see Figure 1.9). Total revenue includes sales of goods and services, operating interest and dividend revenue and other operating revenue. Operating expenses include salaries, wages and employee benefits, purchased goods, materials and services (e.g., energy, water and vehicle fuel), indirect taxes, depreciation and other operating expenses. Cost of materials and supplies accounts for approximately 44% of total expenses while the cost of energy, water and vehicle fuel accounts for 3% of total expenses, and direct and indirect salaries and wages account for 17% of total expenses (Statistics Canada, 2017).

Prices of energy and food products have been volatile over the past decade as evidenced by the food price crisis in 2007/2008, this has considerable implications for profit margins (see Figure 1.9). Dynamic changes in energy supply and demand have important implications for price. The crude oil price decline in 2014 and 2015 contributed to lower natural gas liquid prices (National

Energy Board, 2016). In 2015, annual average wholesale electricity prices were low due to new supply and slowing demand growth (National Energy Board, 2016). Price volatility of electricity, gasoline and natural gas, has motivated companies to invest in energy efficiency initiatives that include the purchase of energy efficient technologies and the implementation of plant-wide energy efficient practices (International Revenue Agency, 2016). Initiatives such as Natural Resources Canada’s energy efficiency for industry financial assistance program will provide assistance for energy management projects and process integration and computational fluid dynamics studies (Natural Resources Canada, 2016).

Establishments classified to the paper, primary metal, chemical and petroleum and coal-manufacturing industries consumed 76% of total energy used in manufacturing in 2016. Together these industries generated 20% of total sales of goods manufactured (Statistics Canada, 2016). In contrast, food and beverage manufacturing consumed 6% of total energy and generated 18% of shipments. Energy consumption by food and beverage manufacturing has increased by 15% from 107,182,718 gigajoules in 2006 to 123,580,143 gigajoules in 2016.

Figure 1.9 Food, Beverage and Tobacco Operating Revenue and Expenses and Profit



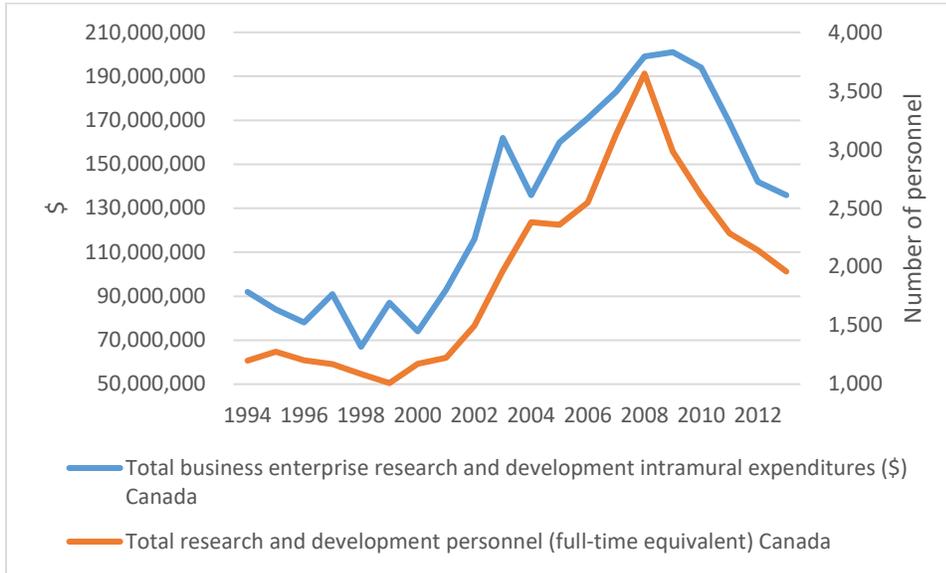
Source: Statistics Canada Table 16-10-0117-01 (formerly CANSIM 301-0008)

1.7 Private R&D Investment and Innovation

Private and public sector investment in Research and Development (R&D) is essential to foster growth and productivity. Innovation initiatives include the introduction of new product development, improvement in production process efficiency, technology improvement and adoption, diffusion and commercialization in response to global competition, changing consumer preferences and the regulatory environment. Food and beverage manufacturing has benefitted from innovation in food safety and preservation processes. Private R&D expenditure may

underestimate actual R&D spending in food and beverage manufacturing because not all businesses systematically track R&D spending (AAFC, 2016).

Figure 1.10 Business Enterprise Research and Development Intramural Expenditure



Source: Statistics Canada Table 27-10-0002-01 & 27-10-0024-01 (formerly CANSIM 358-0024 & 358-0161)

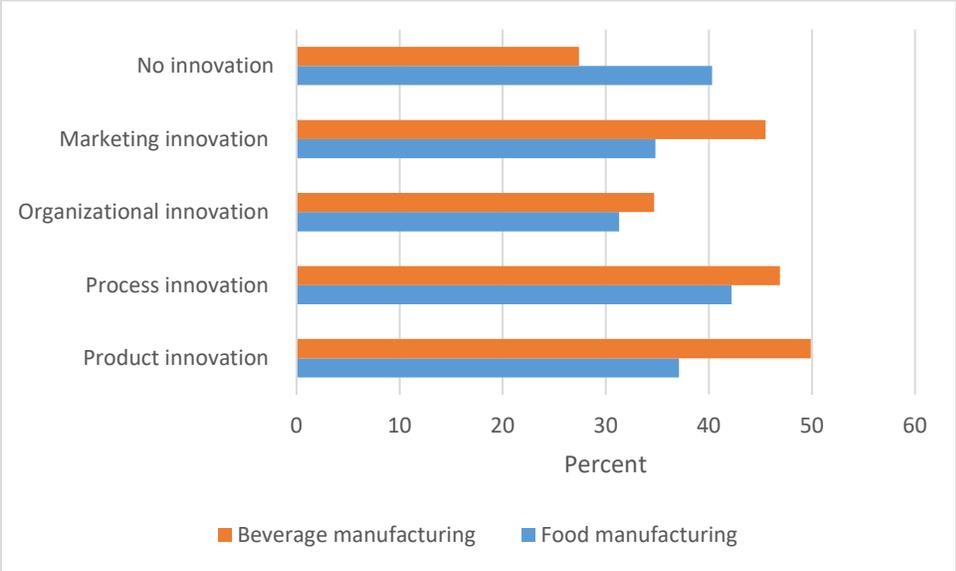
Note: Secondary axis represents number of personnel

Figure 1.10 suggests that in-house research and development expenditure and recruitment of research and development personnel have a similar trend (they increase and decrease in a similar pattern). The new revised business enterprise and development Statistics Canada table 27-10-0333-01 which replaced table 27-10-0002-01 illustrates that over the past three years (data is only available for 2014 to 2016) the average total in-house research and development expenditure is \$153 million. Current expenditure (that includes wages, salaries, services, material and other costs) accounts for 95% of in-house research expenditure while capital expenditure (which includes land, buildings, software and equipment) accounts for 5% of total expenditure. Ontario’s total business enterprise research and development intramural expenditure and personnel involved in research and development show a similar trend to national enterprise research and development expenditure and recruitment.

Figure 1.11 illustrates the introduction of innovations between 2012 and 2014. Product innovation was the most important type of innovation for beverage manufacturing enterprises followed by process innovation, then marketing innovation and lastly, organizational innovation. While for food manufacturing enterprises process innovation was the most important followed

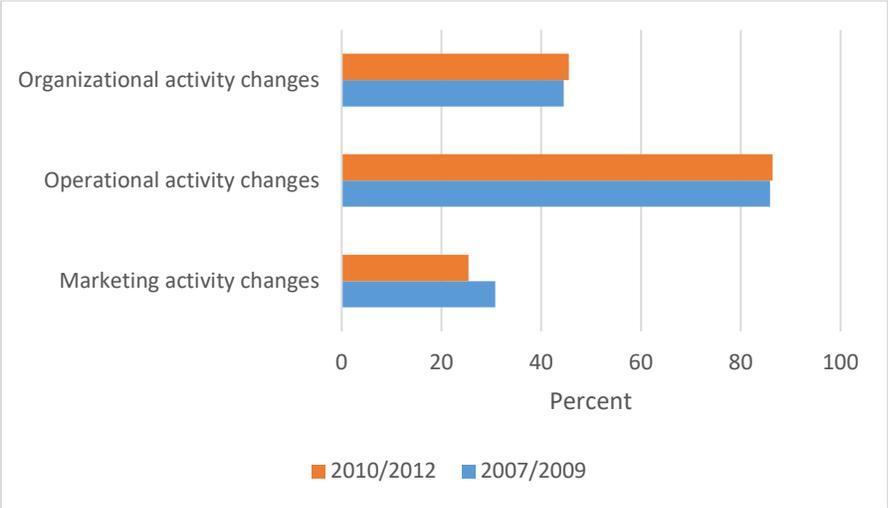
by product innovation, then marketing innovation, and lastly, organizational innovation. Some enterprises reported that they did not have any innovations.

Figure 1.11 Food and Beverage Enterprises 2014 by Innovation Type (percent)



Source: Statistics Canada Table 27-10-0318-01 (formerly CANSIM 358-0443)

Figure 1.12 Changes Resulting from Process Innovation in Food and Beverage Manufacturing (percent)



Source: Statistics Canada Table 27-10-0053-01 (formerly CANSIM 358-0245)

Sixty-one percent of enterprises reported they introduced process innovations (new or significantly improved production process) between 2010 and 2012, which resulted in average

unit cost reduction of between 5% and 11%. Figure 1.12 provides a summary of changes resulting from process innovation. More than 80% of enterprises reported process innovations resulted in operational activity changes, while organizational activity changes and marketing activity changes were reported by 45% and 30% of enterprises respectively.

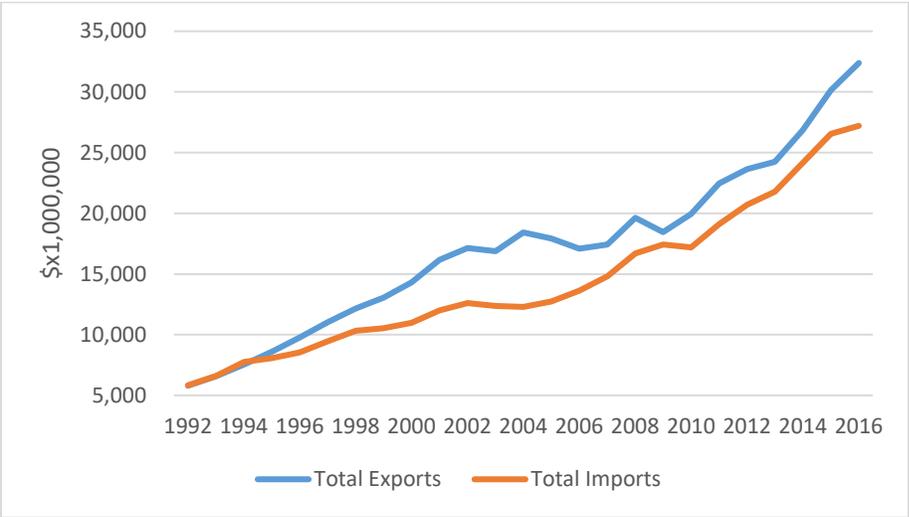
1.8 Food and Beverage Manufacturing International Trade

Canada depends on domestic and export markets for continued growth and to meet consumer demand. Canada also relies on both domestic and import markets for the supply of inputs.

1.8.1 Food Manufacturing Trade

Food manufacturing exports have been increasing, partly because of increases in product prices over the decades and in part due to increases in product volume traded. The United States remains Canada’s largest trade partner, accounting for 71% of food manufacturing exports and 63% of imports. In 2017, China was Canada’s second largest partner, it accounted for 8% of exports and 4% of imports. Canada is diversifying its trade into different regions/countries, although the United States remains as Canada’s largest food manufacturing trade partner credited in part to the North American Free Trade Agreement and in part due to proximity. In the past few decades, Canada has made several trade agreements with different countries. For instance, in 1998 and 2007 Japan was Canada’s second largest food manufacturing export partner accounting for 10% and 8% respectively of food manufacturing exports.

Figure 1.13 Food Manufacturing Exports and Imports Canada (X\$1,000,000)

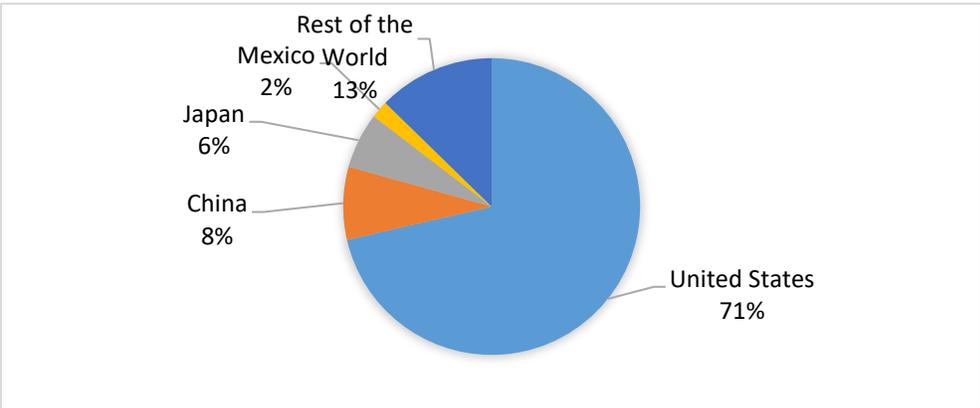


Source: Innovation, Science and Economic Development Canada Online trade data, 2018

In constant dollar terms, exports increased almost six times from \$5.8 billion in 1992 to \$33.9 billion in 2017. On the other hand, imports increased (almost five times) from \$5.8 billion in 1992 to \$27.5 billion in 2017. The trade balance of food manufacturing has been positive since 1995 (it increased from \$537.7 million in 1995 to \$6.5 billion in 2017). Nonetheless, trade balance growth is not constant, it fluctuates from year to year (refer to Figure 1.13).

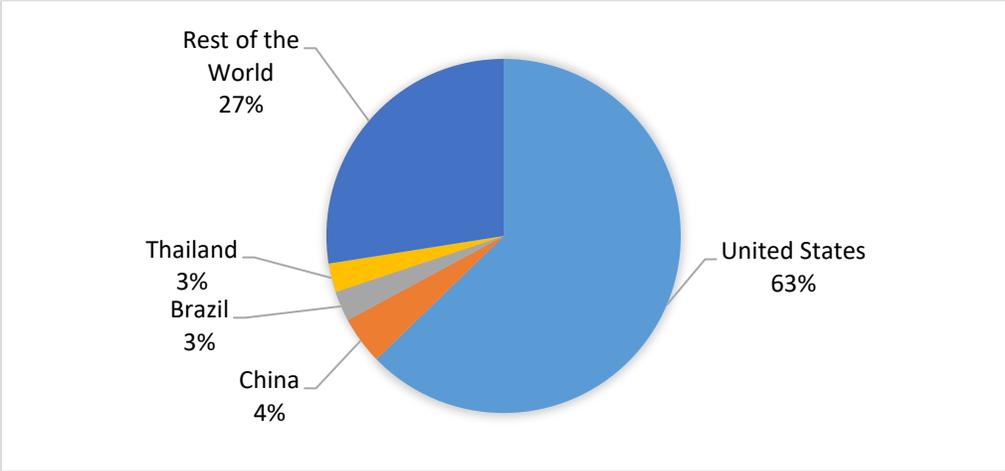
The largest food manufacturing sub-sectors are meat product manufacturing, grain, and oilseed milling, accounting for 23% and 21% respectively of food manufacturing exports (no other sub-sector accounts for more than 14% of exports). Other food manufacturing and fruit, vegetable and specialty food are the largest import sub-sectors accounting for 18% and 16% respectively, of food manufacturing imports. Figures 1.14 and 1.15 illustrate the distribution of food manufacturing imports and exports, showcasing the top four countries.

Figure 1.14 Food Manufacturing National Exports by Country (2017 export value)



Source: Innovation, Science and Economic Development Canada Online data, 2018

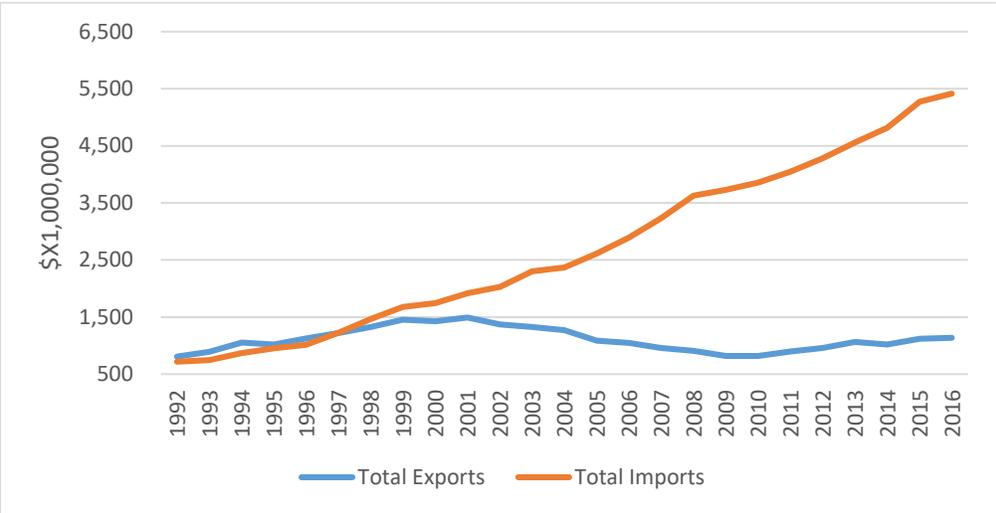
Figure 1.15 Food Manufacturing National Imports by Country (2017 import value)



Source: Innovation, Science and Economic Development Canada Online data, 2018

1.8.2 Beverage Manufacturing Trade

Figure 1.16 Beverage Manufacturing Exports and Imports Canada (X\$1,000,000)

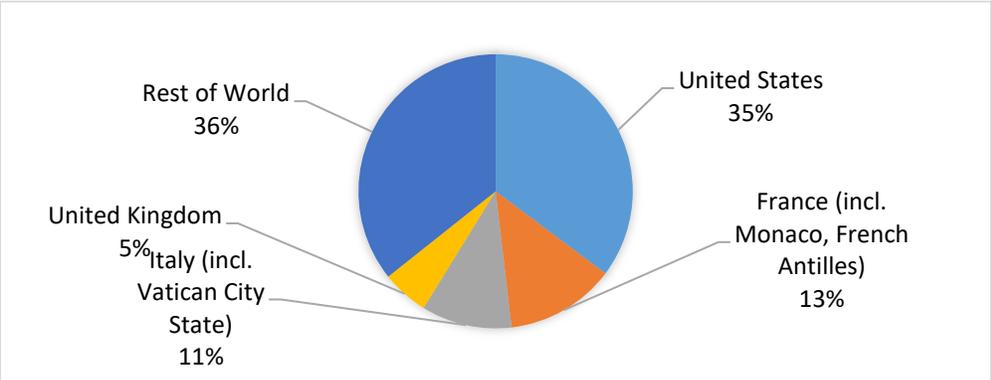


Source: Innovation, Science and Economic Development Canada Online data, 2018

Beverage manufacturing has been a net importer since 1997, the negative trade balance increased almost a thousand times from \$4.5 million in 1997 to \$4.4 billion in 2017. Exports increased by 24% from \$807.8 million in 1992 to \$1.1 billion in 2017 while imports increased almost eight times from \$718.6 million in 1992 to \$5.6 billion in 2017.

The United States is Canada’s largest beverage manufacturing trade partner, Canada exports 84% of beverage products to the U.S. and imports 35% of beverage products from the U.S. Vietnam is the second largest partner accounting for 5% of beverage exports while France and Italy account for 13%, and 11% of imports respectively.

Figure 1.17 Beverage National Imports by Country (2017 import value)



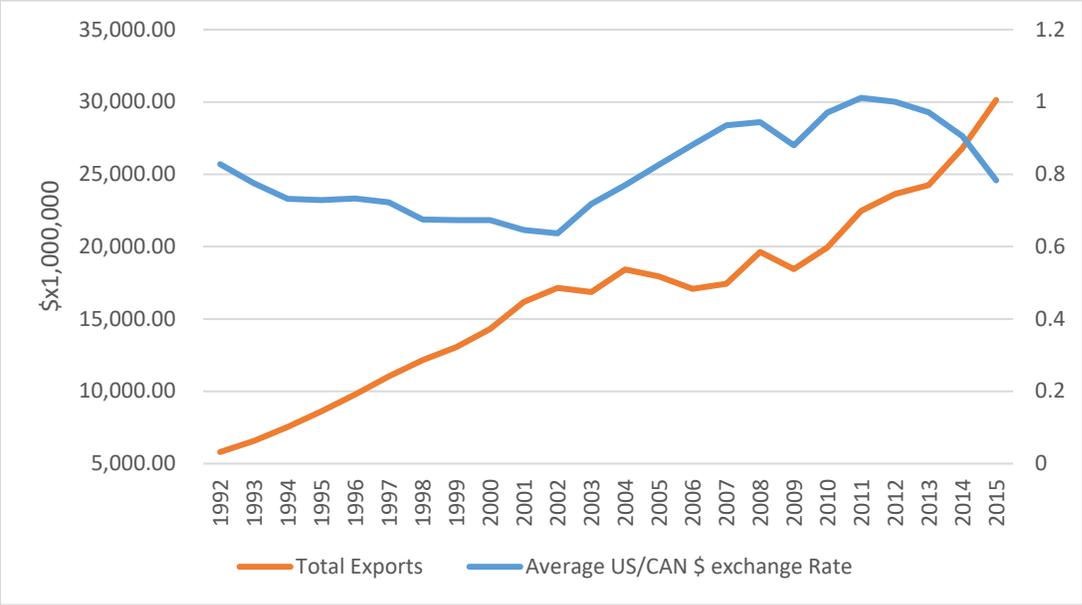
Source: Innovation, Science and Economic Development Canada Online data, 2018

1.8.3 Trade and Exchange Rates

The exchange rate has important implications for exports and imports, nevertheless, the simple correlation between commodity prices and exchange rates cannot on its own, establish a definitive causal link. Economic theory suggests that persistent differences in productivity between any two countries have an impact on real exchange rate with lagging productivity leading to a weakening currency and vice versa.

Figure 1.18 demonstrates the relationship between exports and the exchange rate. Given that the U.S. is Canada’s largest trade partner we use the US\$ to CAN\$ exchange rate for the period 1992 to 2015. Figure 1.18 illustrates that during the period of 1992 to 2002 the value of the Canadian dollar decreased. During this period, exports from Canada to all food and beverage product destinations increased substantially. In contrast, during the period of 2003 to 2008 the value of the Canadian dollar increased, consequently, exports decreased. It is important to note that while the exchange rate has a huge impact on trade there are other factors at play, for example, trade agreements, change in the price of inputs and disease outbreaks and weather conditions.

Figure 1.18 Relationship Between Exchange Rate and Exports



Source: Innovation, Science and Economic Development Canada Online data, 2017 & Canadian Foreign Exchange Services, 2016

Note: The secondary axis shows the U.S./Canada exchange rate

Chapter 2: Canadian Food Policies and the Structure of the Food and Beverage Manufacturing Industry.

2.0 Introduction

Food processing faces significant challenges and opportunities from global markets. These include technological change, changing market requirements (e.g. entry into or exit from free trade agreements like NAFTA, TTP, CETA, CKFTA, CPTPP), the emergence of low cost competitors (e.g. the BRICS), a growing concern for increased health and safety of food products, labour shortages, minimum wage regulations, environmental regulations (e.g. cap and trade) a depreciating Canadian dollar, higher energy prices and growing niche markets. Food policies and regulation can be used as a mechanism to address challenges and to foster productivity and competition however if policies do not respond fast enough to changes in the market they can hinder competition and productivity. In this chapter, we examine food policies and their implications in addressing challenges and opportunities for food and beverage manufacturing firms.

2.1 Domestic Food Policies and Regulation

Canada regulates food safety with process, product and information standards. Process standards specify how the product should be produced through operation standards and good manufacturing practices. Product standards require that final products have specific characteristics, for example, maximum microbial pathogen load for fresh meats and poultry. Food recalls can result from fears of bacterial contamination as well as labelling mix-ups and undeclared contents. Information standards specify the types of labelling or other communication that must accompany products (Caswell, 2003). Information standards enable consumers to make informed decisions based on information that is truthful and not misleading, however, this increases firm compliance costs and reduces competitiveness.

The Food and Drug Act is the primary legislation governing the safety and nutritional quality of food sold in Canada. Food and related health claims are regulated based on scientific evidence and the level of risk to consumer health and safety. The Canadian Food Inspection Agency's (CFIA) guidelines on food labelling, advertising and claims, food standards and compositional requirements (fortification, foods for special dietary uses, food additives, chemical and microbial hazards, veterinary drug residues), packaging material and pesticides explain requirements to meet food and drug regulations (CFIA, 2016). Consumed products are classified as either food or drugs, Food is defined in the Food and Drug Act as items manufactured or sold for use as food or drink, Natural Health Products (NHP) are subsets of drugs and are defined under Natural Health Product Regulation. NHPs are over the counter substances taken in a specified dose (Health Canada, 2016). These definitions determine the classification of a product and provide a framework for regulation. In 2018 a framework defining edibles containing cannabis will be developed (Health Canada, 2018).

The CFIA monitors and enforces regulatory compliance of foods while Health Canada monitors and enforces regulatory compliance for Natural Health Products (NHP) and is responsible for product classification into foods or natural health products (AAFC, 2015). The Canadian Food Inspection Agency's general principles of food hygiene, composition and labelling is a guide for food manufacturers to assist them to control the safety, labelling and composition of food during manufacturing, processing, storage or distribution (CFIA, 2014). Food labels are mandatory for most prepackaged products, core labels should be bilingual, include common name, country of origin, date marking and storage instructions, identity and principal place of business, irradiated foods, legibility and location, list of ingredients and allergens, net quantity, nutrition labelling, sweeteners, food additives, fortification, grades and standards of identity. Often, manufacturers voluntarily provide information on their labels beyond the requirement to provide information to specific customer needs as a marketing tool (USDA ERS, 2016). These claims and statements provide information about allergens and gluten, composition and quality and health claims, methods of production, origin, organic, nutrient content, pictures, vignettes, logos and trademarks. Some label requirements are meant for specific products, for example, alcohol content in alcoholic beverages, the percentage of nuts in chocolate and confectionery products, milk fat, size and grade designation, lean and extra lean for meat products (CFIA, 2016).

Traceability policies are designed to protect consumers from foodborne illnesses. Comprehensive traceability systems and good record keeping practices facilitate timely food safety investigations, recalls and withdrawals (CFIA, 2016). Companies also implement the Preventive Control Plan (PCP), it must be consistent with Hazard Analysis Critical Control Point. It must include identification of all hazards, critical control points and related control measures that are validated by evidence, critical limits, monitoring procedures, corrective action procedures, verification procedures and record keeping procedures (CFIA, 2016).

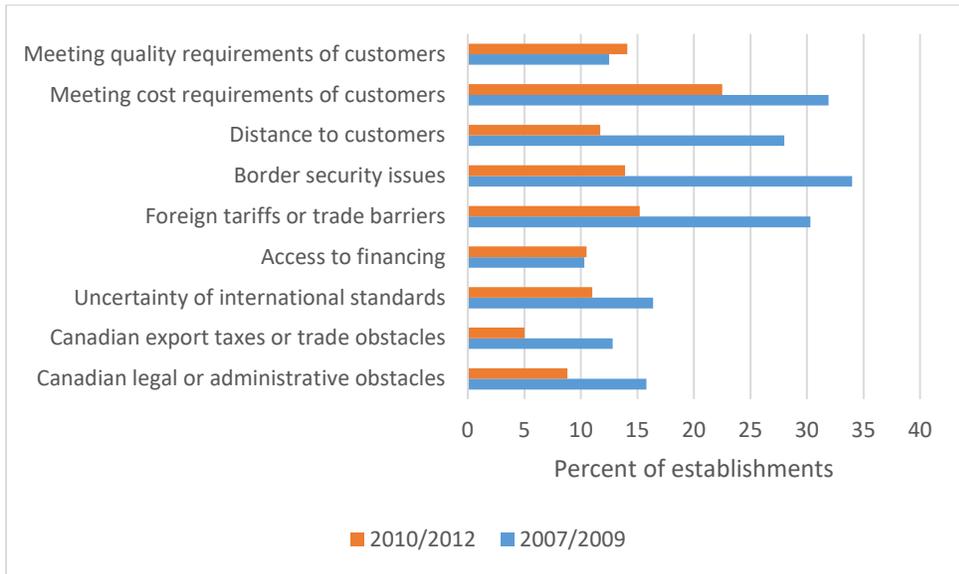
The Safe Food for Canadians Act allows for effective inspection, a renewed commitment to service and more information for consumers. All persons preparing food for exports are required to have a license to meet the requirements of the Safe Food for Canadians Act and its regulations with respect to food safety and to ensure that the food meets foreign state requirements. Imports and exports are required to comply with food Acts and Regulations including labelling, packaging, standards and documentation requirements (CFIA, 2016).

Companies perceive regulatory issues, uncertainty, and risk as their greatest barriers to product development and process innovation according to the Statistics Canada survey of innovation and business strategy (see Figure 2.1). For instance, slow processing times by Health Canada for applications to make health claims and to attain approval of new additives and foods act as a significant regulatory hurdle (Ross, 2011). Despite barriers some manufacturers continue to innovate and promote their products, for example, lack of approval for probiotics did not hinder growth in dairy products. Manufacturers shifted focus to taste, quality, protein content and popularity of Greek yoghurt (AAFC, 2016). In some instances, health claims have resulted in lawsuits. In 2013, Kellogg Canada settled a class action lawsuit related to claims about its frosted Mini Wheats cereal and agreed to pay \$4 million (CBC, 2013)¹. The suit alleged that the company used false advertising when claiming the cereal improved children's cognitive functions without scientific proof. The company has since changed its claims, it now refers to the

¹ CBC. (2013). Kellogg fined \$4M for false Mini Wheats advertising <http://www.cbc.ca/news/business/kellogg-fined-4m-for-false-mini-wheats-advertising-1.1388018>

cereal as being high in fibre, keeping children full, and helping them stay focused (Euromonitor, 2014).

Figure 2.1 Food and Beverage Manufacturing Obstacles of High Importance to Exporting Products



Source: Statistics Canada Table 27-10-0128-01 (formerly CANSIM 358-0301)

The Statistics Canada survey for innovation and business strategy (see Figure 2.1) shows that border security issues, meeting cost requirements of customers, foreign tariffs or trade barriers were an obstacle of high importance to exporting enterprises. The Canadian Chamber of Commerce states that while Canada has been aggressive in pursuing new trade agreements over the past few years businesses continue to face substantial barriers (e.g. tariff and non-tariff trade barriers) expanding abroad, and exporters are falling behind in key markets such as China (Canada Chamber of Commerce, 2016).

2.2 Trade Policies

Canada is pursuing trade liberalization through trade negotiations and policies that boost access to growing (foreign) markets. The two primary policy drivers for exports are food safety and facilitating market access. The Safe Food for Canadians Act of 2012 was designed to modernize, simplify and strengthen rules for food commodities imported into Canada and to provide increased export opportunities for Canadian producers. The Act consolidates the authorities of the Fish Inspection Act, the Canada Agricultural Products Act, the Meat Inspection Act, and food provisions of the Consumer Packaging and Labelling Act. Strengthening of international trade rules to ensure public confidence in food safety and food quality systems uses a science-

based approach to regulate technical trade issues (AAFC, 2014). On one hand, it provides clear and consistent rules for food commodity importers so that consumers can be confident that all food on grocery shelves is safe regardless of origin. It also enables Canadian exporters to be more competitive abroad and open access to an even greater number of international markets by aligning the food safety systems to those of key trading partners (CFIA, 2015). On the other hand, food safety regulations act as non-tariff barriers, they increase compliance costs and reduce competitiveness. In extreme cases, violations of food safety can result in denied access to export markets, outright bans are applied when acute food safety issues are identified. For example, in 2003 the announcement of a single case of BSE in Alberta undermined the entire Canadian cattle industry. Immediately the U.S. and Mexico shut borders to all Canadian beef products (Parliament of Canada, 2005).

The Canadian dairy sector operates under a supply management system based on planned domestic production, administered pricing and dairy product import controls (quota and tariff). Code of practice of the care and handling of dairy cattle has developed a full traceability system that tracks the animal, identifies the premises and animal movement (AAFC, 2016). Provisions made by the Trans-Pacific Partnership deal and the Comprehensive Economic Trade Agreement will increase import quota for specific dairy products (AAFC, 2016). Supply management depends on certainty in dairy production hence trade policies that reduce certainty undermine the system.

Agri-food exports are vulnerable to regulatory barriers that are not addressed by free trade agreements, for instance, country of origin labelling. The U.S. is the major destination for Canadian food exports (refer to Chapter 1). The U.S. Farm Security and Rural Investment Act requires mandatory Country Of Origin Labelling (COOL). Under COOL, animals born and raised in Canada spend 15 days in holding pens before processing. Canada is concerned with the mandatory COOL labelling arguing that it is discriminatory and imposes unnecessary burden and cost to Canadian and American supply chains and hurts producers (AAFC, 2015). The Canadian federal government appealed to the World Trade Organization (WTO) arguing that COOL increased costs, lowered processing efficiency and distorted trade. The U.S. Congress repealed mandatory Country of Origin Labelling in December 2015 after the WTO ruled that it violated international trade rules².

Genetically modified organisms (GMO) labelling is not mandatory according to the U.S. and Canada Federal Food Drug Act, though manufacturers can voluntarily label their products. GMO labelling is only required if there is a material difference between a genetically engineered product and a conventional product (U.S. Dept. of health & human services, 2016). The premise of the policy is that safety evaluation of food and chemical products is based on the properties of the product and not the manner in which it was produced (U.S. Dept. of Health & Human Services, 2016). While the U.S. has strongly opposed GMO labelling, it is mandatory in Europe and has huge implications for trade in light of newly negotiated trade agreements like the Comprehensive Economic and Trade Agreement (CETA). Europe also prohibits the use of growth hormones in farm animals. Canada developed a hormone-free certification program in response to the European Union's strict zero tolerance policy for a low level presence of unapproved genetically modified organisms in food products. This includes a ban on the feed

² MacLean's 2015 U.S. Congress repeals country of origin labelling law <http://www.macleans.ca/news/canada/u-s-congress-repeals-country-of-origin-meat-labelling-law/>

additive ractopamine (which affects Canadian pork and beef exports). The European Union does not accept some decontamination methods approved in Canada for beef (AAFC, 2012).

2.3 Investment Policies

Regulatory requirements can encourage innovation through programs that help companies to invest in new products and technologies, or inhibit, or delay innovations through being unresponsive to changes in the economic, social and technical conditions. For instance, Canada removed tariffs on manufacturing inputs and machinery to reduce the regulatory and customs burden on Canadian businesses³. Over the years, both the private and public sector have made significant investments in food and beverage manufacturing.

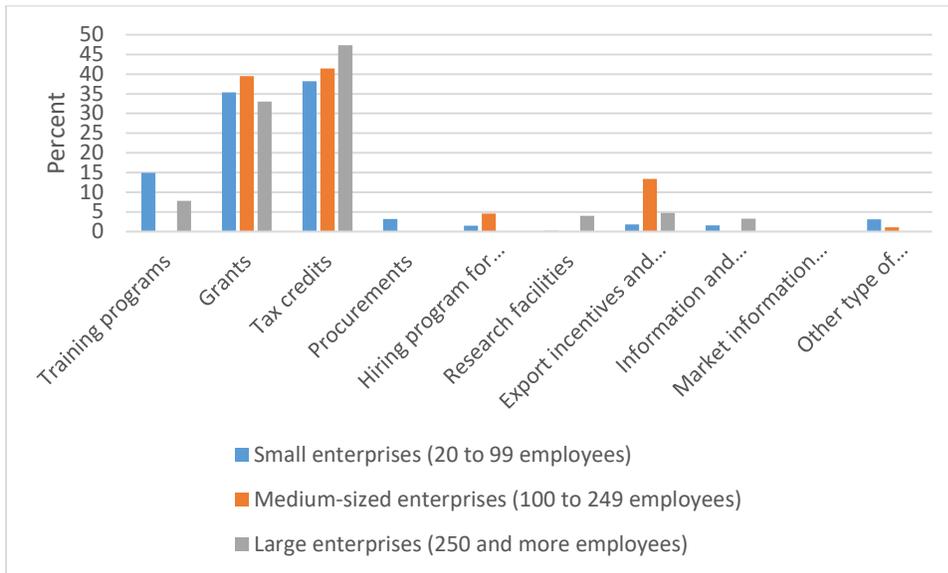
2.3.1 Government Investment Initiatives

Public R&D investment has been implemented in three phases. The first generation, the Agricultural Policy Framework (APF) 2003-2008 focused on business risk management, food safety, quality, and environmentally responsible production for the agriculture and agri-food sector. The second-generation, Growing Forward 1 (GF1) 2008-2013 shifted emphasis toward science and innovation to enhance sector productivity, profitability and competitiveness and greater recognition of bio-economy opportunities beyond primary agriculture to the processing sector (AAFC, 2015). The first stream of GF1 was led by AAFC research activities, it addressed regulatory challenges, animal and plant health and environmental programs such as SAGES (Sustainable Agriculture Environmental Systems), WEBs (Watershed Evaluation of Beneficial Management Practices) and NAHARP (National Agri-Environmental Health Analysis and Reporting Program). The second stream of GF1 was led by industry through Canadian Agri-Science Clusters and Developing Innovative Agri-Products (DIAP).

The third phase, Growing Forward 2, 2013-2018, increased investments in science and innovation, it encourages partnerships and industry-led research and development activities (AAFC, 2015). Examples of these initiatives include the food and beverage growth fund, the Scientific Research and Experimental Development (SR&ED) tax incentive, federal advanced manufacturing fund for cutting-edge technologies and large-scale activities and the Ontario Apprenticeship Training Tax Credit (ATTC), a refundable tax credit for businesses employing apprentices during the first 48 months of an apprenticeship program. The federal accelerated Capital Costs Allowance (CCA) program provides a ten-year tax incentive to boost productivity. It provides an incentive for firms to invest in new machinery and equipment for increasing productivity levels. The Canadian Chamber of Commerce argues that further work needs to be done by the government to change corporate tax rates and breaks, they argue that tax laws are costly and complex and penalize growth of small firms (Canada Chamber of Commerce, 2016).

³ Department of Finance Government of Canada 2013 – Foreign trade zone <https://www.fin.gc.ca/ftz-zf/index-eng.asp>

Figure 2.2 Government Support Programs Most Critical for Food and Beverage Manufacturing Innovation Activities (2010/2012)



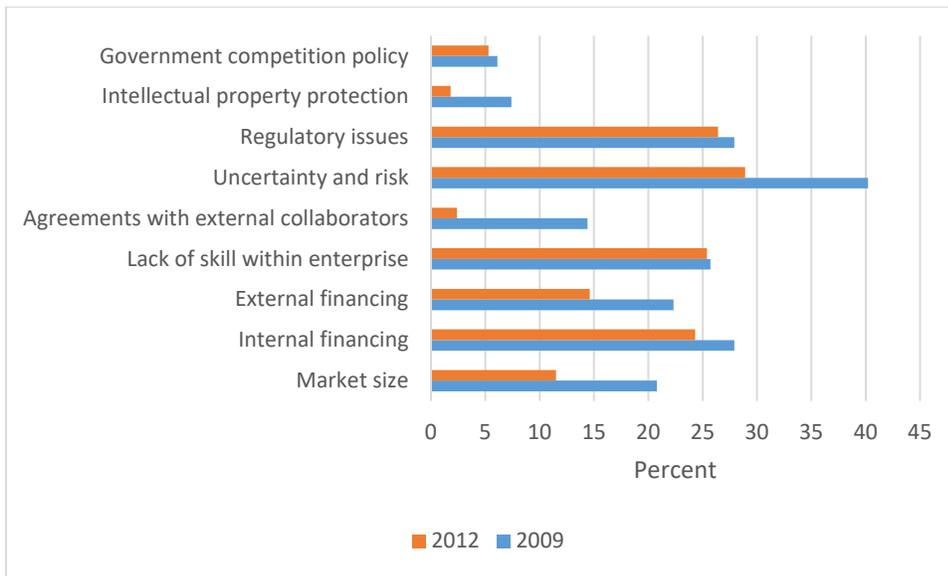
Source: Statistics Canada Table 27-10-0092-01 (formerly CANSIM 358-0267)

Results from the Statistics Canada Survey of Innovation and Business Strategy (see Figure 2.2) illustrates that government grants, training programs, export incentives and tax credits are viewed as the most important support programs by small, medium and large food and beverage manufacturing enterprises.

2.3.2 Private Investment Initiatives

In Chapter one, product and process innovation were identified as the most important types of innovation for food and beverage manufacturing. Product and process innovation requires a combination of skills and technology to produce a product.

Figure 2.3 Food and Beverage Manufacturing Obstacles to Innovation



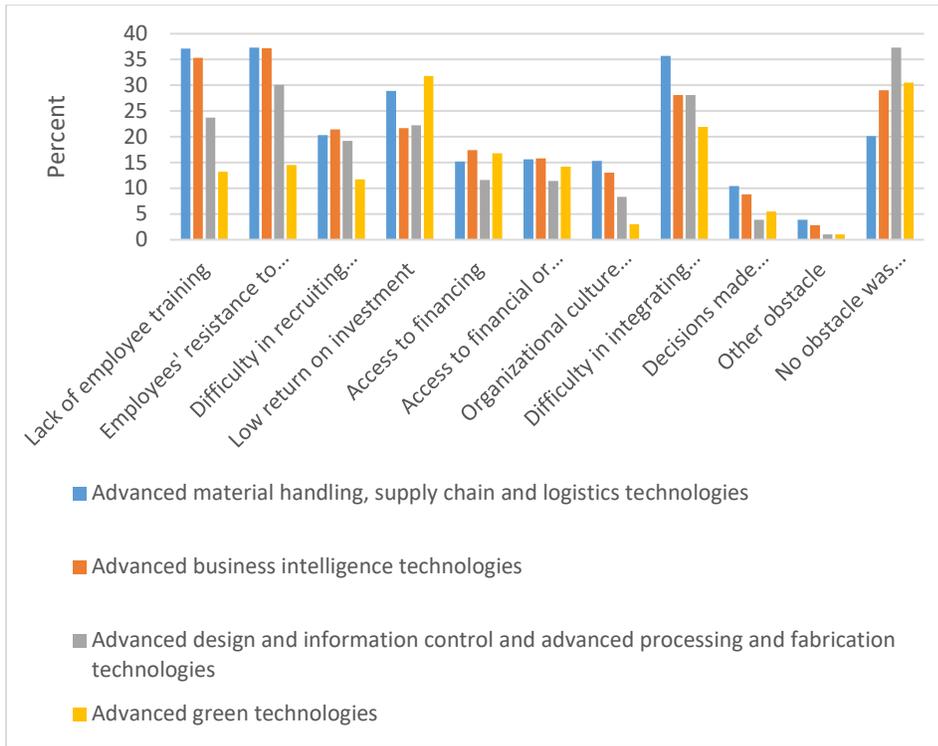
Source: Statistics Canada Table 27-10-0093-01 (formerly CANSIM 358-0268)

Lack of skill within the enterprise and internal financing rank third and fourth as barriers to innovation (Figure 2.3). The Canadian Chamber of Commerce states that many workers lack adequate reading, digital skills (like interpreting graphs and instruction manuals) and Science, Technology, Engineering and Math (STEM) skills which are critical as enterprises adopt technologies (like robots, data and artificial intelligence) that enhance productivity (Chamber of Commerce, 2016). Literature suggests that there is lack of staff skilled in database design and computer programming. A 2017 report by the Agricultural Institute of Canada shows that there is a shortage of labour (especially in primary agriculture) and a shortage of commodity-specific research specialists and technicians in the food and beverage processing companies.

Figure 2.4 shows that lack of employee training, employee resistance to change, low return on investment and difficulty in integrating new advanced technologies with existing systems were the main obstacles to adopting a technology. However, some firms indicated that they did not encounter any obstacles.

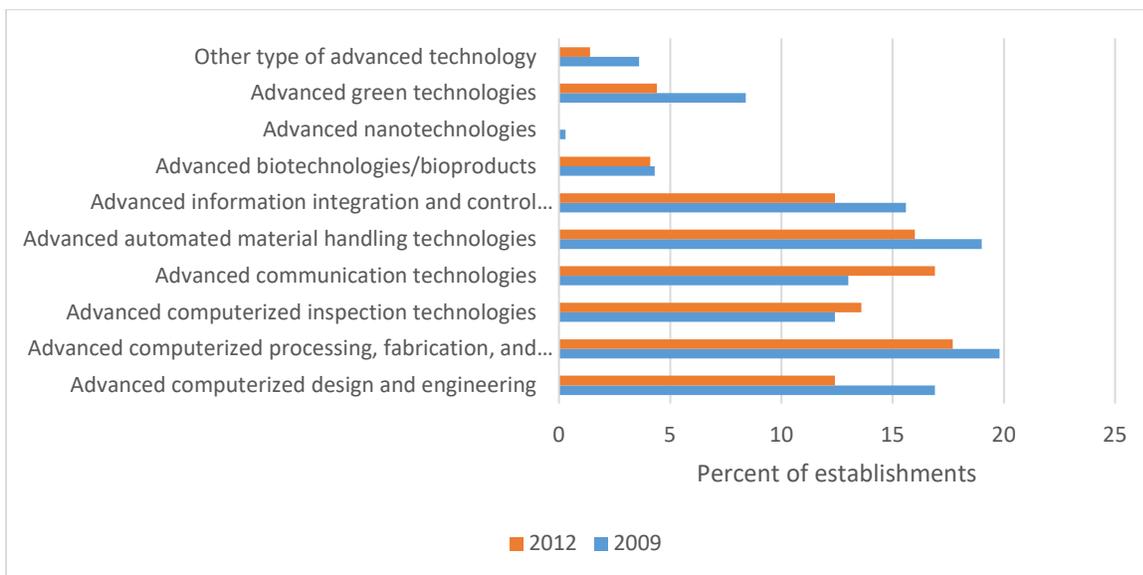
Figure 2.5 illustrates that 12% to 20% of enterprises reported that they used advanced handling, information, communication, inspection, processing and design technologies. Less than 5% of enterprises reported use of green technologies, nanotechnologies and biotechnologies in 2012.

Figure 2.4 Obstacles to the Adoption of Advanced Technology by Food Manufacturing Firms



Source: Statistics Canada Table 27-10-0282-01 (formerly CANSIM 358-0407)

Figure 2.5 Advanced Technology Use by Food and Beverage Manufacturing Enterprises



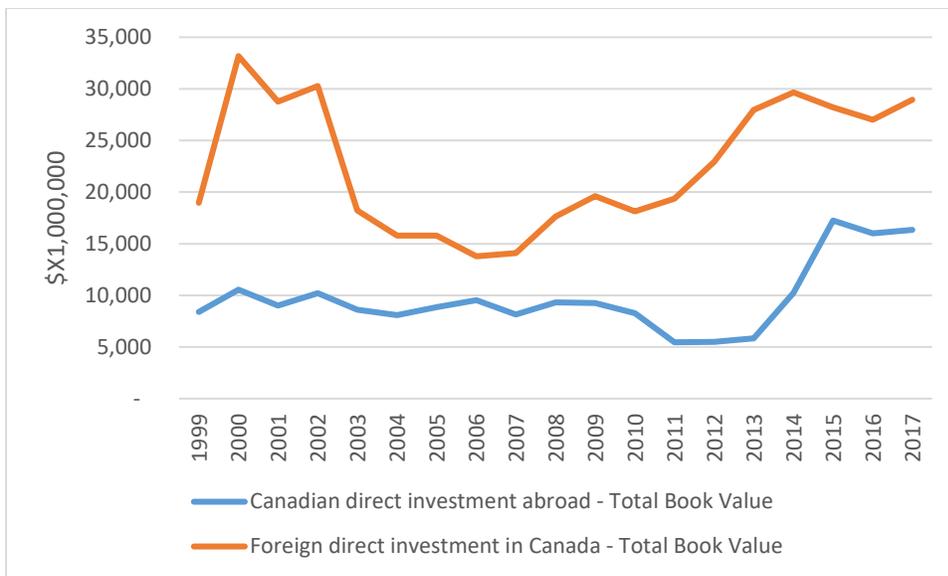
Source: Statistics Canada Table 27-10-0134-01 (formerly CANSIM 358-0237)

2.3.3 Food and Beverage Manufacturing Foreign Direct Investment

The Investment Canada Act and Foreign Investment Promotion and Protection Agreement (FIPA) require Canada to treat foreign investors equally to domestic investors with respect to establishment, acquisitions, expansion, management and operation (Global Affairs Canada, 2014). Companies have taken advantage of advances in technology and an enabling policy environment to spread their operations across multiple locations to increase efficiency, lower costs and speed up production. In 2016, food and beverage manufacturing accounted for 4.1% of the total national foreign direct investment, which is 18% of manufacturing foreign direct investment. In terms of Canada direct investment abroad in 2016, food and beverage manufacturing accounted for 1.5% of total national investment abroad, which is 18.7% of manufacturing Canada direct investment abroad. These statistics suggest that food and beverage manufacturing has a significant role in foreign direct investment (into Canada) and Canada’s direct investment abroad.

Figure 2.6 illustrates that food and beverage manufacturing Foreign Direct Investment (FDI) into Canada is greater than Canada Direct Investment Abroad (CDIA) total book value. Canada Direct Investment Abroad increased by 95% from \$8.4 billion in 1999 to \$16.3 billion in 2017. On the other hand, Foreign Direct Investment (FDI) into Canada increased by 53% from \$18.9 billion in 1999 to \$28.9 billion in 2016. CDIA and FDI fluctuate from year to year, in part due to changes in market structure (e.g. mergers and acquisitions) and economic condition of the host country. Mergers and acquisitions involving large firms sometimes lead to large year to year changes in the U.S. direct investment position in Canada’s food and beverage industry (USDA, 2016).

Figure 2.6 Food, Beverage and Tobacco Direct Investment in Canada and Abroad



Source: Statistics Canada Table 36-10-0009-01 (formerly CANSIM 376-0052)

The A.T. Kearney's FDI confidence index is a forward-looking analysis of how political, economic and regulatory changes will likely affect a country's FDI inflows in the coming year⁴. In 2016, the U.S. ranked first followed by China then Canada. Out of a possible score of three, the U.S., China and Canada scored 2.02, 1.82 and 1.80 respectively. Canada gained one spot in ranking third in 2016 from fourth in 2015. The Canadian Agri-Food Policy Institute (CAPI) argues that the increase in FDI indicate that small and large firms in Canada are being purchased with FDI resulting in upgrades to machinery, equipment, and technology in plants (CAPI, 2014). Canada-China Foreign Investment Promotion and Protection Agreement (FIPA), which came into effect in October 2014, will most likely increase investment opportunities between the two countries since, Canada has the lowest marginal corporate income tax rate among G7 countries which may attract more FDI (Canadian Chamber of Commerce, 2013).

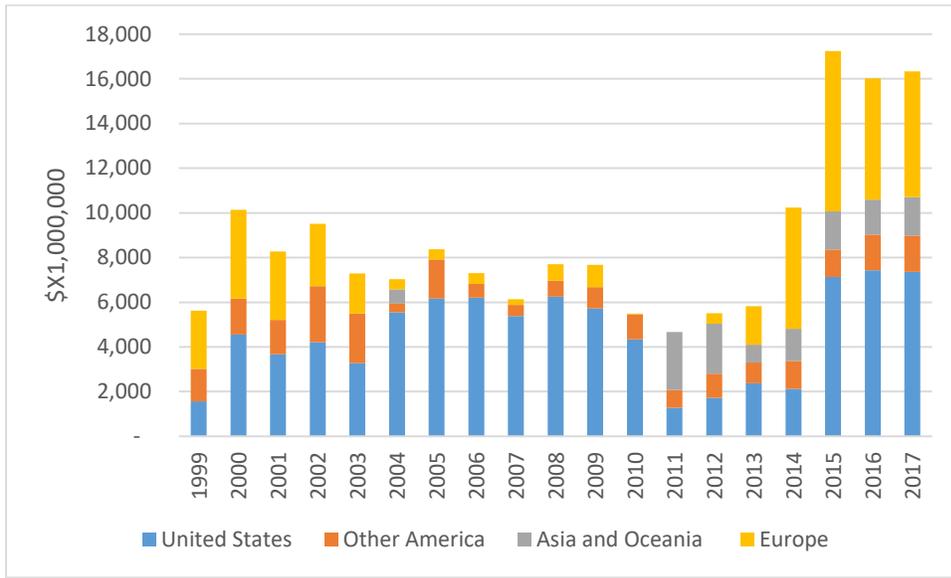
Multinational companies grow their businesses through mergers and acquisitions. For example, in 2014, 3G Capital, a Brazilian firm, acquired Tim Hortons⁵, Canada's iconic quick service restaurant. FDI options comprise licenses, joint ventures and ownership. Licenses are normally used as a short-term tool for testing the market and obtaining brand recognition. Joint ventures involve joint ownership or agreements through alliances. Ownership is the most preferred method because it offers control over all aspects of the business including brand names, technology and skills (AAFC, 1995). Many studies in literature have attempted to analyze the effect of merger and acquisition activity on market power and firm efficiency as this has important welfare implications. However, estimating these effects empirically is difficult. For instance, booming economic conditions can mask poor management. Also M&A data is not publicly available while high profile acquisitions are published by media. Focusing on them may result in selection bias and in data that is not representative of M&A activity.

Integrated global supply chains, foreign investment and cross border portfolio holdings have resulted in firms expanding production beyond domestic markets. Companies can choose to export, establish new operations or acquire existing companies. For example, George Weston has taken over a Nashville based company Creative Occasions Inc. to grow its cakes. The Canadian Agri-Food Policy Institute (CAPI) suggests that Canadian firms are investing abroad rather than using Canada as an export platform (CAPI, 2014). A 2015 Statistics Canada report states that as Canadians expand their activities across national borders through foreign direct investment this has led to a number of policy related challenges on issues such as outsourcing jobs, competitiveness and export performance (Statistics Canada, 2015).

⁴ The 2016 A.T. Kearney Foreign Direct Investment Confidence Index https://www.atkearney.com/gbpc/foreign-direct-investment-confidence-index/publication/-/asset_publisher/lsBVD71WgZDd/content/2016-a-t-kearney-foreign-direct-investment-confidence-index/10192

⁵ Canadian Business – Why foreign ownership has been great for Tim Hortons <http://www.canadianbusiness.com/blogs-and-comment/why-foreign-ownership-has-been-great-for-tim-hortons/>

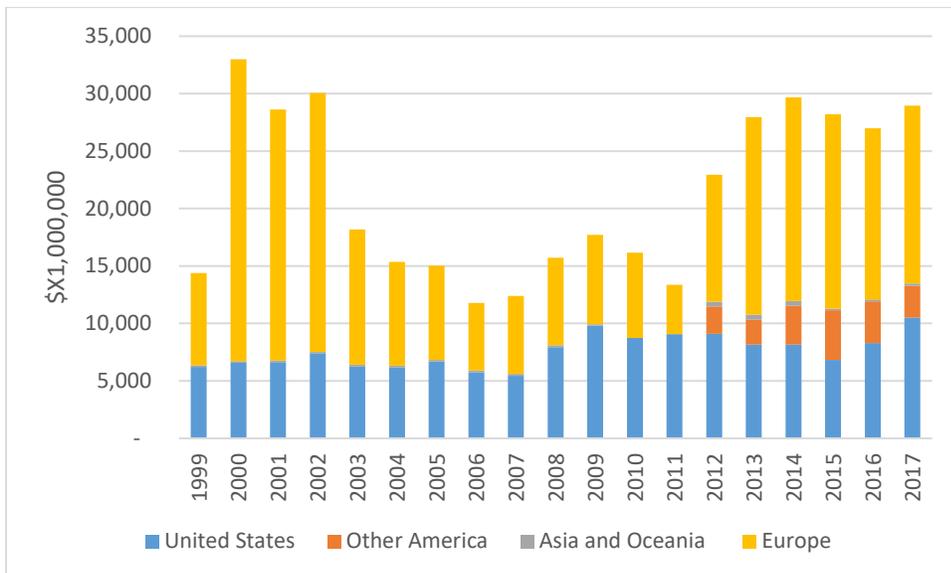
Figure 2.7 Food, Beverage and Tobacco Manufacturing Canada Direct Investment Abroad



Source: Statistics Canada Table 36-10-0009-01 (formerly CANSIM 376-0052)

In 2017, Canadian firms invested \$7.4 billion in the U.S. accounting for 45% of total food, beverage and tobacco manufacturing direct investment abroad (refer to Figure 2.7). The second largest investment of \$5.6 billion was made in Europe accounting for 34% of food, beverage and tobacco manufacturing direct investment abroad.

Figure 2.8 Food, Beverage and Tobacco Manufacturing Foreign Direct Investment in Canada



Source: Statistics Canada Table 36-10-0009-01 (formerly CANSIM 376-0052)

Figure 2.8 illustrates that in 2017, Europe invested \$15.5 billion accounting for 53% of FDI while the U.S. invested \$810.5 billion, accounting for 36% of total food and beverage manufacturing FDI into Canada. Trade agreements such as CETA and TPP are likely to improve Canada's FDI stock, which may partly explain increased investment by Europe, Asia and Oceania and other America. Other America countries invested \$2.8 billion in 2017, accounting for 10% of total FDI while Asia and Oceania countries invested \$188 million accounting for 1% of total food and beverage manufacturing FDI. Countries classified as other America made their first investments in Canada food and beverage manufacturing in 2012.

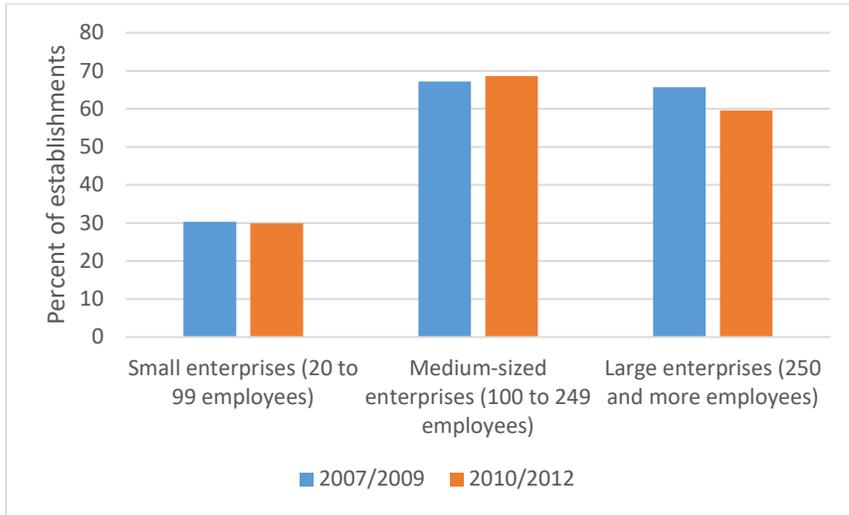
2.4 Food and Beverage Supply Chain

Food and beverage manufacturing is a high volume, fast moving, low margin business (AAFC, 2016). Cost control and product positioning is an important aspect of managing profit margins to minimize waste. The food supply chain connects three main sectors: the agricultural sector, the food processing industry and the distribution sector (wholesale and retail) (AAFC, 2016). Specific supply chains exist for every single food item purchased by consumers because food processing is heterogeneous. The food and beverage processing industry produces processed goods using both primary and processed products as inputs that are then distributed as inputs or as finished products to food manufacturers, food retailers, food service establishments and ultimately the consumer (AAFC, 2015). In 2011, raw agricultural inputs accounted for 50% of total value of material inputs, processed inputs from the food and beverage processing industry accounted for 33% of inputs and fish and seafood accounted for 4% of inputs. The remaining 13% of inputs came from packaging materials, energy, chemical additives and ingredients (AAFC, 2016). The 2011 output disposition shows that 48% of total sales of processed food and beverage products went to Canadian food retailers, 18% was exported to foreign markets, 13% went to domestic food service providers, 14% was shipped to other food manufacturers for further processing, 4% to primary agriculture and 1% to inventory (AAFC, 2016).

2.4.1 Food and Beverage Manufacturing Exports

Food processing has undergone significant structural change becoming increasingly consolidated, (which in some instances leads to concentration) and export oriented because of globalization of food markets. Figure 2.9 shows the number of food and beverage manufacturing establishments that exported or attempted to export their products.

Figure 2.9 Food and Beverage Manufacturing Enterprises that Exported or Attempted to Export Products

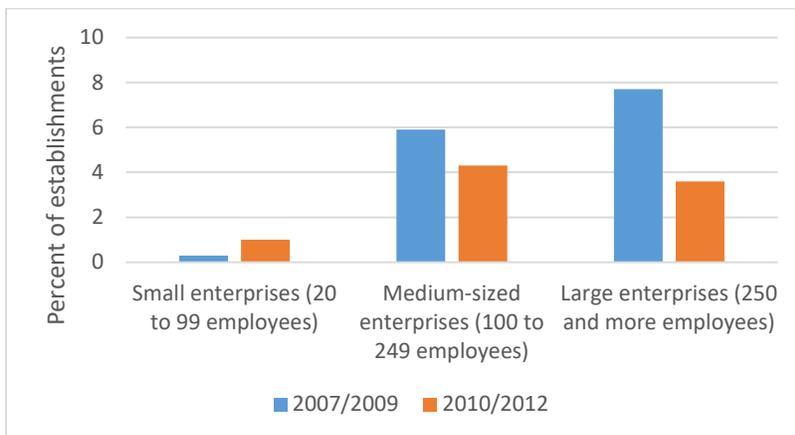


Source: Statistics Canada Table 27-10-0078-01 (formerly CANSIM 358-0300)

2.4.2 Food and Beverage Manufacturing Relocation into Canada

In 2007/2009, 2% of food and beverage manufacturing businesses relocated into Canada compared to 1.8% in 2010/2012 (refer to Figure 2.10). Statistics suggest that medium and large enterprises with 100 and more employees were more likely to relocate. Business activities relocated into Canada include production of goods, provision of services, distribution and logistics, information and communication services, human resource management and financial management. The U.S. was the most important country for relocation, approximately 66% of business activities relocated from the U.S. (Statistics Canada, 2017).

Figure 2.10 Relocation of Business Activities from Another Country Into Canada

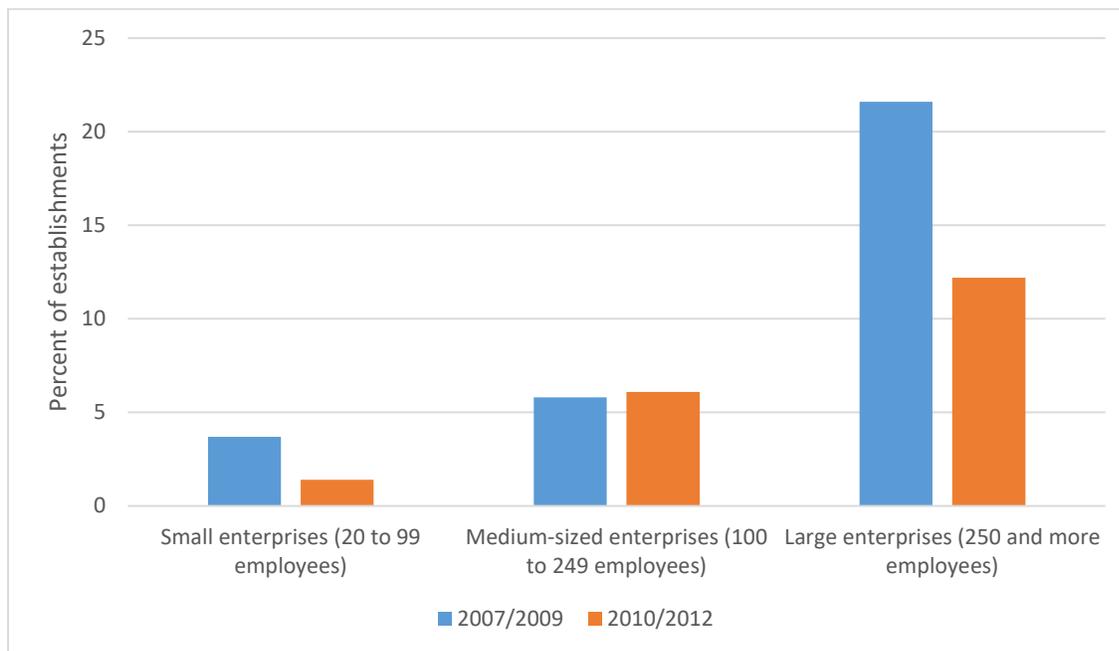


Source: Statistics Canada Table 27-10-0063-01 (formerly CANSIM 358-0292)

2.4.3 Food and Beverage Manufacturing Relocation from Canada

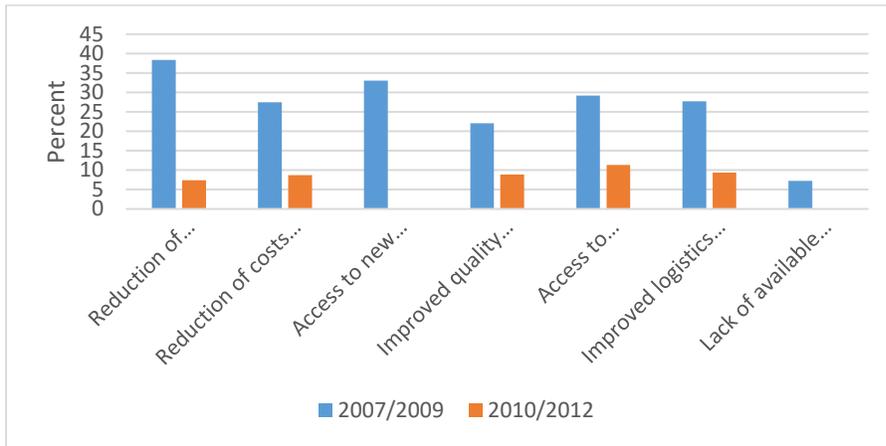
During the period 2007/2009 approximately 7.6% of food and beverage manufacturing businesses relocated from Canada compared to 3.9% that relocated in 2010/2012 (Statistics Canada, 2017). The statistics suggest that large enterprises with 250 and more employees were more likely to relocate from Canada. Business activities relocated or outsourced include production of goods, distribution and logistics, marketing, sales and after sales services, software development and data processing, information and communication. Reasons for relocating include access to resources and cost reduction (refer to Figure 2.12). The United States was the most important country for relocating or outsourcing activities in 2009, it accounted for 53.8% of activity relocated and outsourced from Canada. Other important countries were India accounting for 27.8% and Germany accounting for 7.5% of activity relocated and outsourced from Canada (Statistics Canada, 2017).

Figure 2.11 Relocation of Business Activities from Canada to Another Country



Source: Statistics Canada Table 27-10-0113-01 (formerly CANSIM 358-0284)

Figure 2.12 Reasons for Relocating or Outsourcing Business Activities

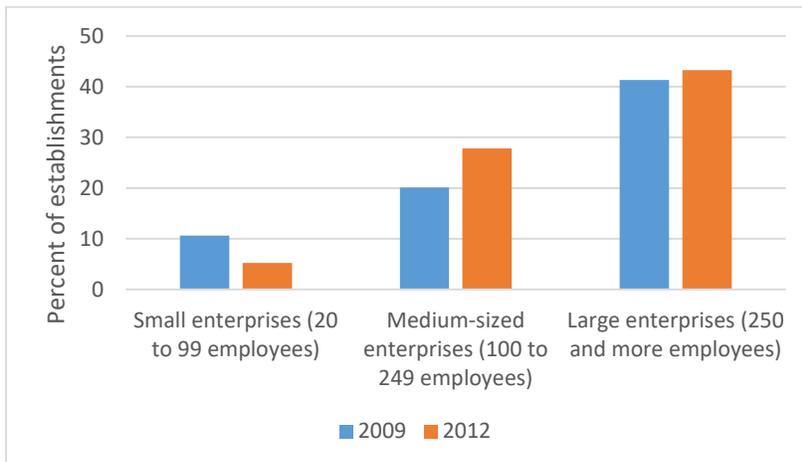


Source: Statistics Canada Table 27-10-0047-01 (formerly CANSIM 358-0289)

2.4.4 Food and Beverage Manufacturing Business Operation

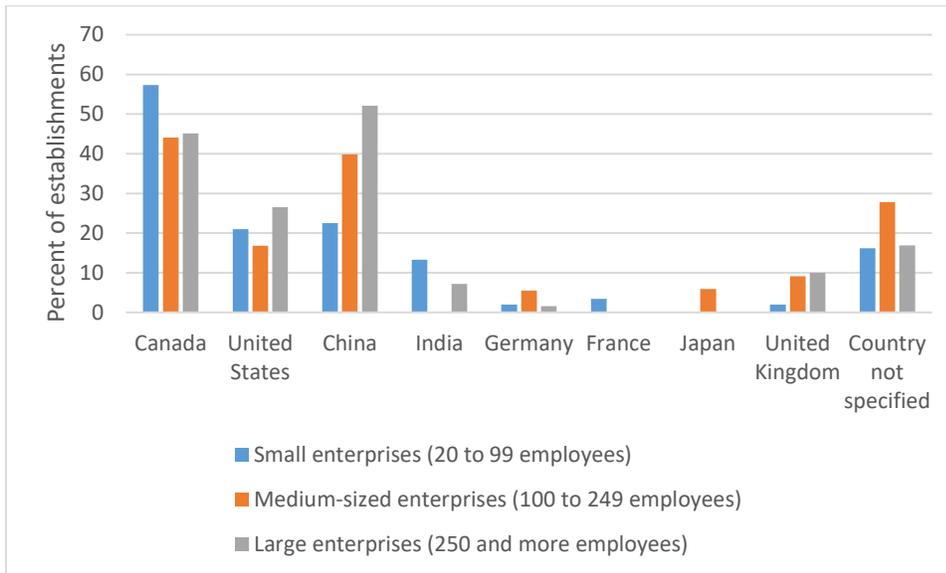
The Statistics Canada Survey of Innovation and Business Strategy (SIBS) illustrates that in 2012, 94% of business enterprise head offices were located in Canada, while 4% were located in the U.S., 1.6% in Europe and 0.3% in Asia Pacific. Some enterprises are subsidiaries of another enterprise. A subsidiary is a business entity, which has more than 50% of the ordinary shares or voting power owned by another business entity (Statistics Canada, 2017). Figure 2.13 illustrates that 5% of small enterprises (20 to 99 employees), 28% of medium-sized enterprises (100 to 249 employees) and 43% of large enterprises (250 or more employees) are subsidiaries of another enterprise.

Figure 2.13 Food and Beverage Manufacturing Enterprises that are Subsidiaries of other Enterprises



Source: Statistics Canada Table 27-10-0096-01 (formerly CANSIM 358-0271)

Figure 2.14 Most Important Countries in Which Enterprises Made Changes to Operational Activities



Source: Statistics Canada Table 27-10-0112-01 (formerly CANSIM 358-0283)

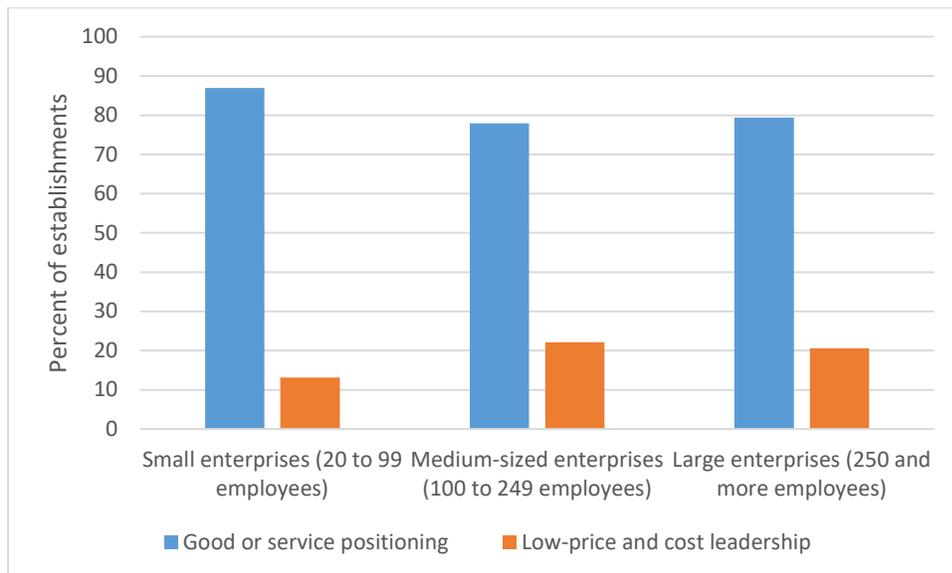
Figure 2.14 shows that small, medium and large enterprises identified Canada, U.S. and China as the most important countries in which enterprises made changes to operational activities. This shows that to some extent government initiatives on promoting food and beverage manufacturing competitiveness and market access in global markets are yielding some results.

2.5 Competitiveness and Productivity

The fundamental approaches to Porter’s competitive positioning are cost leadership and product positioning. Cost leadership offers internal financial advantage while product positioning embraces the opportunity to add value. Product positioning can be achieved in numerous ways that include lower price levels, superior quality and elaborate services (Hooley et al, 1998).

The Statistics Canada Survey of Innovation and Business Strategy (SIBS) shows that in 2012, more than 78% of enterprises indicated that good or service positioning was the most important long-term business strategy compared to less than 25% for low price and cost leadership (refer to Figure 2.15). Gross margin/operating margin and sales/income growth are the most important performance indicators used to monitor long-term growth (Statistics Canada, 2017).

Figure 2.15 Most important Long-Term Strategy to Enterprises for Food and Beverage Manufacturing (2012)



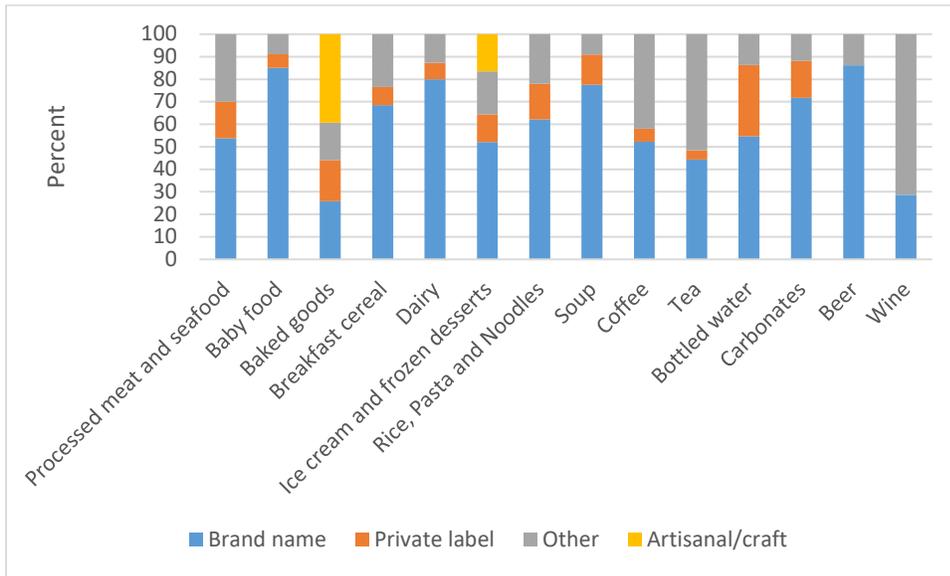
Source: Statistics Canada Table 27-10-0131-01 (formerly CANSIM 358-0304)

2.5.1 Market Share, Concentration, Consolidation and Product Branding

Market share is a good indicator of change in the competitive landscape and it drives company strategies to form mergers or make acquisitions. To improve efficiency, save cost and to gain market access, multinationals are increasingly consolidating and expanding their operations. Increased consolidation has not necessarily led to increased concentration. Concentration is a measure of share of production of top firms; it is an indicator of market power and the degree of concentration varies by food categories (Euromonitor, 2015). While manufacturer concentration is not evident at the global level for total packaged food sales, firm concentration may exist in specific product lines and regional markets (Euromonitor, 2015).

Firm concentration is particularly evident for those products where the manufacturer's brands are popular like soups, breakfast cereal and baby food. Food products that are less differentiated such as bread, meat or flour are less concentrated (Euromonitor, 2015). Firms that are active in the concentrated categories operate at global level and typically offer branded products. A strong brand may act as a signal of quality, thus helping secure consumer loyalty. At the same time, it may make it harder for potential rivals to compete, dissuading them from entering the market. The incidence of private label and no label products is more widespread in craft production e.g. bakeries, butcheries but their geographic scope is likely to be narrow (AAFC, 2012).

Figure 2.16 Brand Retail Market Value Share (percentage) by Industry



Source: Euromonitor Global Market Information Database, 2016

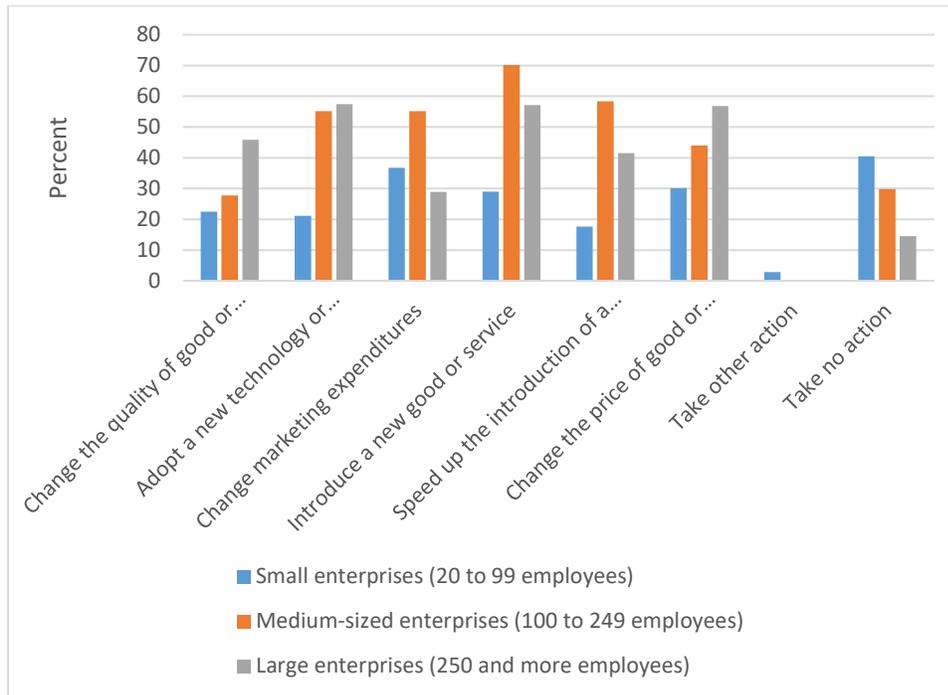
Figure 2.16 illustrates that brand name products have a large market share for dairy products, soup, baby food, beer and breakfast cereal, while for products like baked goods, wine and tea private label, other and artisanal/craft has a significant share. Popular name brands and private (retail store brand) labels such as Loblaw in-store brands (such as No Frills' No Name and upscale President's Choice) drive innovation and competition, which increases demand for specific product lines.

Retail consolidation and concentration increases the degree of retail brand penetration and power. Loblaw, Sobeys and Metro are the three main food retailers⁶ nationwide. In July 2009, Loblaw purchased T&T supermarket, Canada's largest Asian food store, to increase its ethnic consumer market share. Canada's changing demographics offer grocery stores the opportunity of expanding ethnic food aisles and sections. This trend has been observed in major grocery stores such as Food Basics and FreshCO. Supermarkets also compete for market share with box stores and mass merchandisers like Walmart and Costco that also own private labels like Great Value Brand (Walmart) and Kirkland (Costco).

Figure 2.17 shows that changing the quality of the product, adopting new technology, changing marketing expenditure, introducing new products and changing the price of products are the common measures taken in response to increased competition.

⁶ Dynamics of the food and beverage manufacturing sector in Quebec: The retailer perspective <http://www.mnp.ca/en/posts/dynamics-of-the-food-and-beverage-manufacturing-sector-in-quebec-the-retailer-perspective>

Figure 2.17 Measures Taken in Response to Increased Competition in the Main Market of the Highest Selling Good

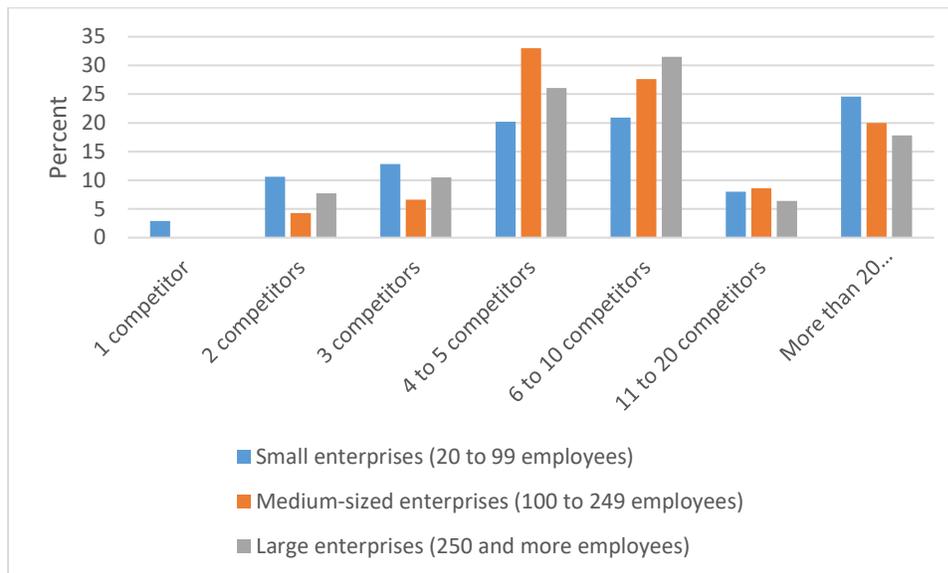


Source: Statistics Canada Table 27-10-0167-01 (formerly CANSIM 358-0335)

2.5.2 Competition Strategies

The two common competition strategies are geographic expansion into new markets fostered by new trade agreements (mainly in developing countries) and greater emphasis on product category management (USDA, ERS, 2016). Per capita consumption of staple or traditional food is declining in most developed countries thus the new strategy is to export to countries with rising per capita consumption. Figure 2.18 illustrates that food and beverage manufacturers are facing fierce competition. A majority of companies reported having 4 to 10 competitors and over 20 competitors for their highest selling product (including multinational companies). A majority (67%) of enterprises reported that multinational companies were among competitors.

Figure 2.18 Competitors Faced by Enterprise for Highest Selling Good or Service in Main Market



Source: Statistics Canada Table 27-10-0163-01 (formerly CANSIM 358-0331)

The Government has introduced several initiatives that include reducing corporate tax rate, investing in global trade opportunities, eliminating tariffs, funding worker skills training and investment in new technologies to give manufacturers a competitive edge.

In response to mounting market pressures, food manufacturers are focusing on specific product lines where they have inherent advantages (Euromonitor, 2015). The new strategy is category management and focused growth in contrast to the old strategy of product portfolio diversification. It allows them to become leaders in certain core product lines and to better cater to consumers in different markets (USDA, ERS, 2016). For example, in 2013/2014 Maple Leaf Foods sold its bakery (Canada Bread Co.) and pasta (Canada Bread's Olivieri Pasta) business to focus on its meat operations (Euromonitor, 2016).

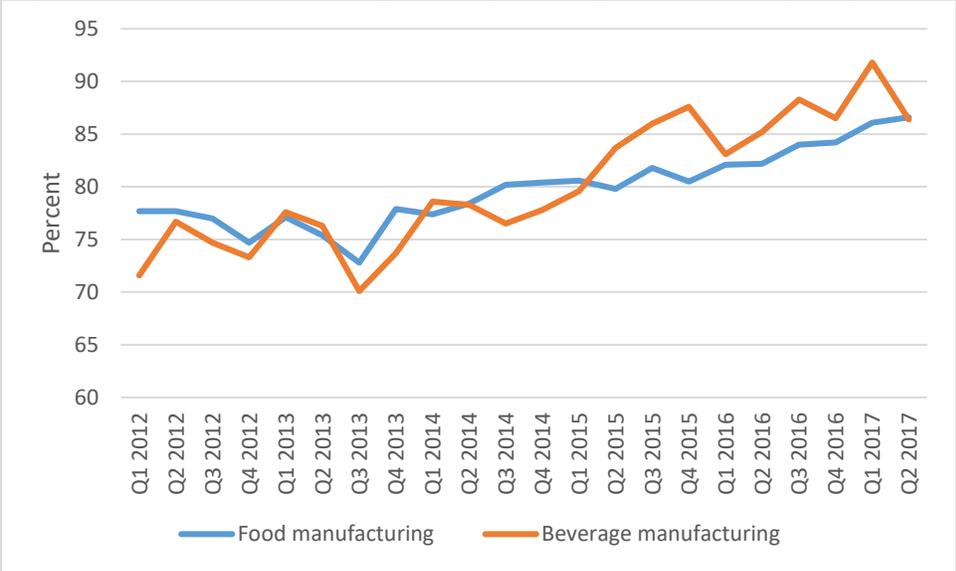
2.5.3 Capacity Utilization and Productivity

Capacity utilization helps forecast the labour market, final demand, consumption and inflation. An increase in capacity utilization signals an increase in employment and capital spending⁷. Capacity utilization rates for food and beverage manufacturing fluctuate from year to year and or season to season. Statistics Canada reports capacity utilization data on a quarterly basis. Figure

⁷ Why capacity utilization is an important economic indicator <http://marketrealist.com/2014/07/capacity-utilization-important-economic-indicator/>

2.19 suggests that in general over the past five years food and beverage manufacturing capacity utilization has been increasing.

Figure 2.19 Food and Beverage Manufacturing Industrial Capacity Utilization Rate

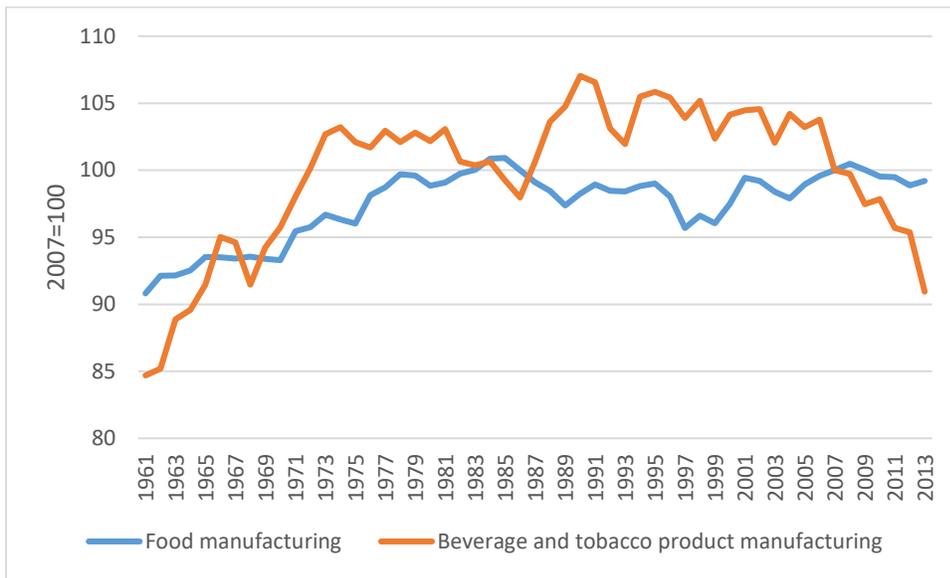


Source: Statistics Canada Table 16-10-0109-01 (formerly CANSIM 028-0002)

Multifactor productivity (MFP) relates output to a combination of inputs used in the production of that output, such as labour, capital, energy, materials and purchased services (KLEMS). Labour productivity is the ratio of the output of goods and services to the labour hours devoted to the production of that output (Statistics Canada, 2015). Measures of multifactor productivity growth track movements in technical progress and production efficiency (Statistics Canada, 2013). MFP growth is pro-cyclical, rising in economic expansions and falling in economic downturns (Statistics Canada, 2013).

Food and beverage manufacturing has been able to produce more goods and services over time by making production more efficient. Beverage and tobacco manufacturing multifactor productivity has been decreasing since 2007, it decreased from 103.8 in 2006 to 90.9 in 2013. On the other hand, the multifactor productivity of food manufacturing is flattening, it increased from 97.8 in 2004 to 99.2 in 2013 (see Figure 2.20).

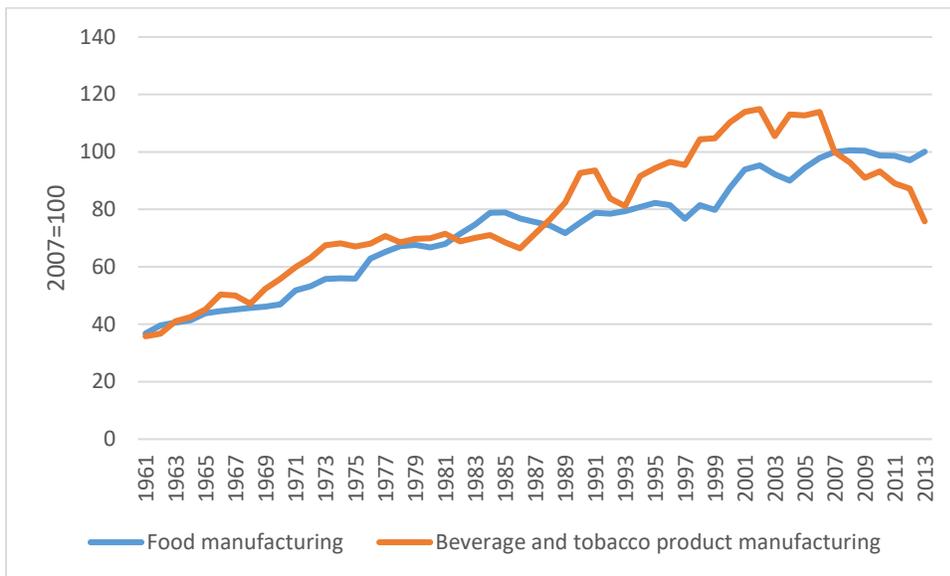
Figure 2.20 Food and Beverage Manufacturing Multifactor Productivity Based on Gross Output



Source: Statistics Canada Table 36-10-0217-01 (formerly CANSIM 383-0032)

Figure 2.21 illustrates that labour productivity of food manufacturing has been increasing while that of beverage manufacturing has been decreasing since 2007.

Figure 2.21 Food and Beverage Manufacturing Labour Productivity Based on Value Added



Source: Statistics Canada Table 36-10-0217-01 (formerly CANSIM 383-0032)

Chapter 3: Challenges and Opportunities of the Canadian Food and Beverage Manufacturing Industry.

3.0 Introduction

Food and beverage manufacturing is classified into ten sub industries; animal food manufacturing, grain and oilseed milling, sugar and confectionery product manufacturing, fruit and vegetable preserving and specialty food manufacturing, dairy product manufacturing, meat product manufacturing, seafood product preparation and packaging, bakeries and tortilla manufacturing and other food manufacturing. This chapter discusses consumption trends, product positioning and marketing trends as well as the competitive environment of each of the ten food and beverage manufacturing industries.

3.1 Highlights of Consumption Trends

Demographics and consumer preferences are the major drivers of demand for food. Consumers are seeking food ingredients that go beyond basic nutritional benefits to enhance general well-being and even disease prevention based on choice or necessity i.e. food intolerance (AAFC, 2016). Statistics Canada estimates that 32% of Canada's population is comprised of children under 14 years and adults over 65 years. Some studies suggest that households with children and elderly members tend to be more health conscious than other age groups although there is no consensus in the literature. Consumers are increasingly demanding healthy, convenient, nutritious (better for you or fortified/functional) and tasty, natural and organic products.

Better for you products are defined as products where the amount of substance considered less healthy has been actively reduced. This includes products with reduced fat, reduced sugar, reduced salt, reduced caffeine and low calories. High sodium intake has been linked to elevated blood pressure and processed foods contain high sodium levels (AAFC, 2016). Cholesterol fears have led food manufacturers to adopt trans-fat reduction. Examples of better for you products include sugar-reduced juices and use of natural sweeteners such as stevia. In dairy manufacturing, Saputo leads in reduced fat milk, on the go milk products and flavoured milk with its extensive line of single serve, shelf stable products. In sugar and confectionery manufacturing, Mondelez International's Cadbury Adams and Mars Inc.'s Wrigley lead in sugar-free gum manufacturing (Euromonitor, 2016).

Fortified (cannot make a health claim) and functional (can make a health claim) foods are defined as the mandatory addition of vitamins and minerals to food to restore nutrients lost during processing to address a public health requirement (AAFC, 2016). Examples include addition of vitamin D to fluid milk to prevent childhood rickets, increased fiber, whole grain, added omega 3s, omega 6s, healthy snack foods, yoghurt with added probiotics and juices with added nutrients and antioxidants, use of super fruits like pomegranate and blueberry, energy drinks and Kellogg's Krave product line.

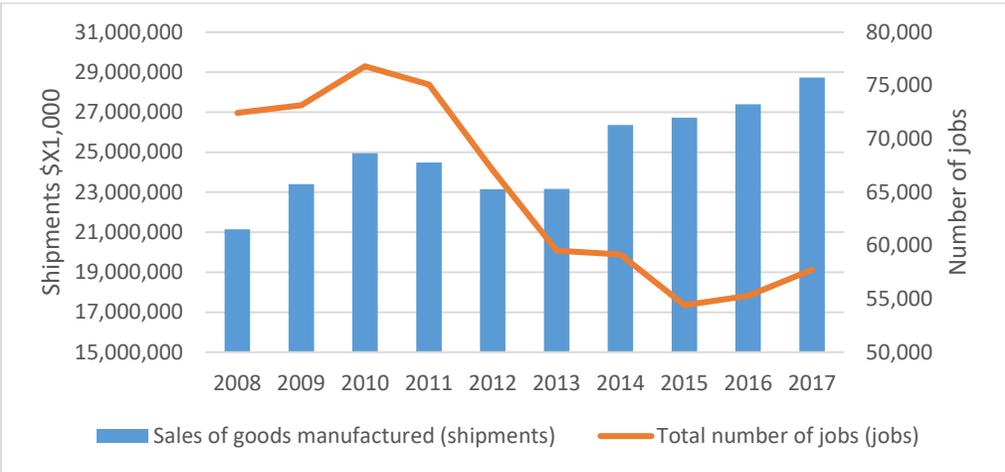
The drivers for the food intolerant segment include food allergies, lactose and gluten intolerance. Gluten-free food is the fastest growing food intolerance segment, gluten-free baked goods lead this category. One-third of Canadians demand gluten-free food, however, the market is expected to stabilize (AAFC, 2013). Gluten-free foods include quinoa, rice, potatoes, corn and soybean. Agropur Cooperation, Mead Johnson and Abbott Laboratories are the leading players for lactose intolerant products such as soymilk and almond milk (Euromonitor, 2016).

Naturally, healthy products without artificial preservatives or additives have a strong appeal although the market for staple foods such as bread is saturated (Euromonitor, 2016). The market for Nestea made from real tea leaves and beverages made up of 100% fruit/vegetable juice is growing. Bread is promoted as high fiber, high protein, low fat and low sugar. General Mill’s Cheerio cereal is popular for its soluble fiber and the claim that it lowers cholesterol and the risk of heart disease (Euromonitor, 2016).

3.2 Meat Product Manufacturing (Canadian)

Meat processing companies manufacture a wide variety of meat products ranging from fresh and frozen meat to processed, smoked, canned and cooked meats as well as sausage and deli meats. About 70% of processed meats in Canada, such as sausages or cold cuts are made with pork (AAFC, 2016). Meat product manufacturing is the largest employer and generates the highest shipments of all food and beverage manufacturing industries. In 2017, meat product manufacturing generated shipments valued at \$28.7 billion, which accounted for 25% of total food and beverage manufacturing shipments. Meat product manufacturing employed 57,745 people in 2017, accounting for 22% of total food and beverage manufacturing employment (refer to Figure 3.1). Ontario, Alberta and Quebec account for 85% of total shipments of manufactured meat products, all three provinces share borders with the United States. Close proximity to the U.S., Canada’s most important trade partner gives them a competitive advantage.

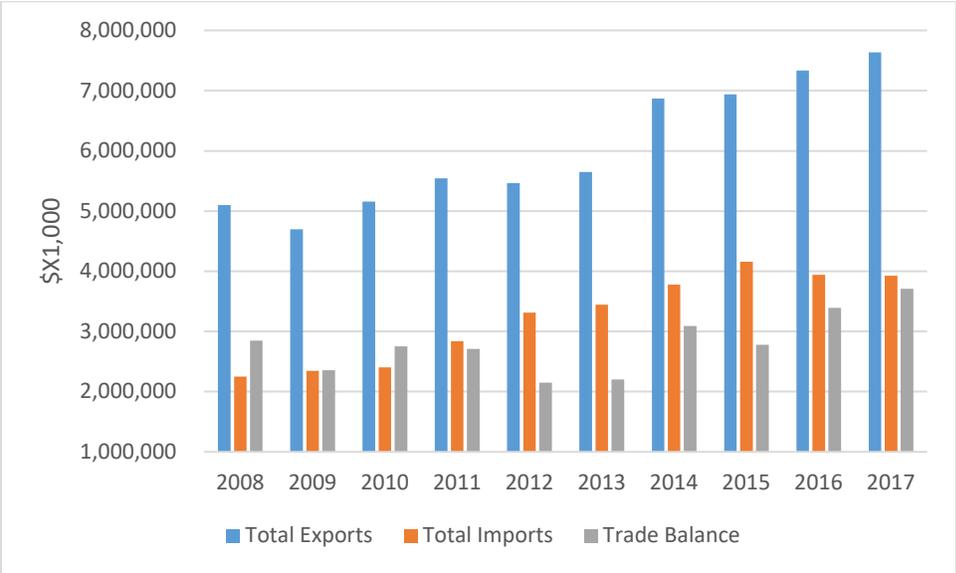
Figure 3.1 Canada Sales of Manufactured Meat Products (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0047-01 (formerly CANSIM 383-0031 & 304-0014)

Canada was a net exporter of meat products in 2017, it exported \$7.6 billion and imported \$3.9 billion meat products (refer to Figure 3.2). The United States, Japan and China are the most important countries for meat product manufacturing exports, accounting for 50%, 19% and 11% respectively of total meat product exports. Exports to China have increased over the last ten years. In 2007 exports to China were valued at \$123.3 million and accounted for 3% of total exports compared to \$853.5 million in 2017, accounting for 11% of total meat product exports (Innovation, Science and Economic Development Canada, 2017). The United States accounts for 76% of meat product imports, while Australia and New Zealand account for 7% and 6% respectively.

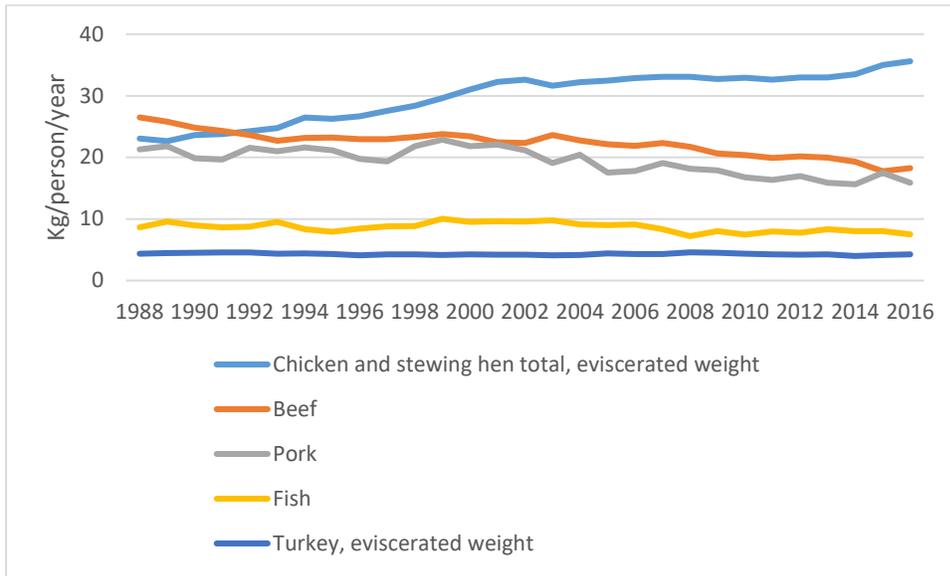
Figure 3.2 Canada Meat Product Manufacturing Imports, Exports and Trade Balance (\$)



Source: Innovation, Science and Economic Development Canada Online trade data, 2018

Maple Leaf Foods is the largest meat processor, it has strengthened its position through a complex series of mergers. Maple Leaf Foods accounts for 34% retail market value while Olymel and Maple Lodge account for 9% and 6% (Euromonitor, 2016). Schneider, Olymel and Maple Lodge are the top three-processed meat brands, however, private labels like Loblaw’s President Choice and Compliments from Sobeys are also popular. Maple Leaf leads in hog processing followed by Olymel while Cargill Foods and Lakeside Packers lead in beef processing. Lilydale Foods, Maple Leaf Poultry, Maple Lodge, Olymel and Sunrise Poultry lead in poultry processing. The largest meat processors produce more than one type of meat product and are expanding their product range. Maple Leaf sold its pasta and bakery business and closed underperforming manufacturing facilities to focus on its meat operations while Olymel has increased its processing capacity by expanding its hog slaughterhouse in Quebec (Euromonitor, 2016). In December 2015, Maple Leaf launched the “Protein Build” marketing campaign to promote the health benefits of its products as being a source of protein, vitamin B and amino acids (Euromonitor, 2016).

Figure 3.3 Food Available in Canada, Annual Kilograms per Person



Source: Statistics Canada Table 32-10-0054-01 (formerly CANSIM 002-0011)

Figure 3.3 illustrates that per capita consumption of chicken is increasing while consumption of beef and pork is declining and consumption of turkey and fish is almost flat. Red meat consumption is declining due to price and health concerns. Meat manufacturing has experienced volatile input prices and unstable economic conditions in several export markets (AAFC, 2016). Consumer preferences are heterogeneous, some consumers prefer white meat (chicken, fish, seafood which they say is more nutritious), others prefer red meat (high protein meat), others get their protein from vegetables and legumes. Consumers are incorporating non-meat options into their diets. Frozen meat substitutes are performing well, Maple Leaf is the leader in this category. Hain Celestial's Yves Veggie Cuisine is the leading meat substitute brand with its carrot, kale and potato patties (Euromonitor, 2016).

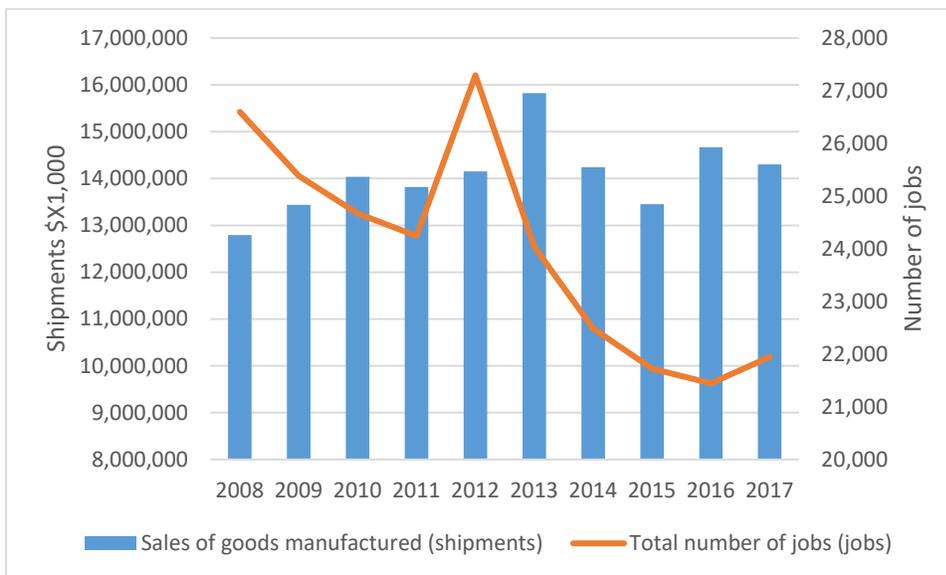
There is limited differentiation in beef markets. Options for processors include reducing feed costs and cost of production and innovative methods such as producing all natural, free of preservatives, hormone free, antibiotic free meat and sterilizing beef through irradiation. In 2017, the federal government approved irradiation on ground beef, irradiation can potentially eliminate E.coli.

Consumers are advocating for humane handling and slaughter of food animals. The Meat Inspection Act and the Meat Hygiene Manual of Procedures and Annexes require humane handling and slaughter of all food animals (CFIA, 2017). The CFIA does not regulate claims about how meat, poultry and fish were raised or fed (this information is voluntary). However, this brings about confusion as to the definition of natural. Natural meat means different things to different people, it can mean no antibiotics or hormone free or grass fed. However, some processors use claims like raised without the use of antibiotics, raised without the use of added hormones that are more specific and might not be misleading (CFIA, 2016).

3.3 Dairy Product Manufacturing (Canadian)

There are two main markets for milk, the fluid market that produced 27.9 million hectoliters and the industrial market that produced 53.6 million hectoliters in 2016 (Canadian Dairy Information Centre, 2017). Saputo, Agropur and Parmalat are the largest processors accounting for 23.5%, 16.2% and 15% of retail market value respectively (Euromonitor, 2016). Popular dairy products include specialty cheese, cheddar, mozzarella, yoghurt, hard ice cream, butter, whey based protein products, and condensed dairy products, ice cream, frozen desserts and skim milk (refer to Figure 3.6). In 2017, dairy product manufacturing employed 21,945 people, accounting for 8% of total food and beverage manufacturing employment. Dairy product manufacturing generated shipments valued at \$14.3 billion in 2017, which accounted for 13% of total food and beverage manufacturing shipments (refer to Figure 3.4). Dairy product manufacturing is the second largest industry after meat product manufacturing, in terms of shipments. Ontario accounts for 39% of dairy product shipments while Quebec accounts for 37% of total dairy product shipments. Soymilk and almond milk are the most popular dairy alternatives intended for lactose intolerant consumers. Consumers are concerned with milk fat content, in response processors have come up with various innovations that include skimmed low-fat milk and production of flavoured milk drinks.

Figure 3.4 Canada Sales of Manufactured Dairy Products (Shipments and Jobs)

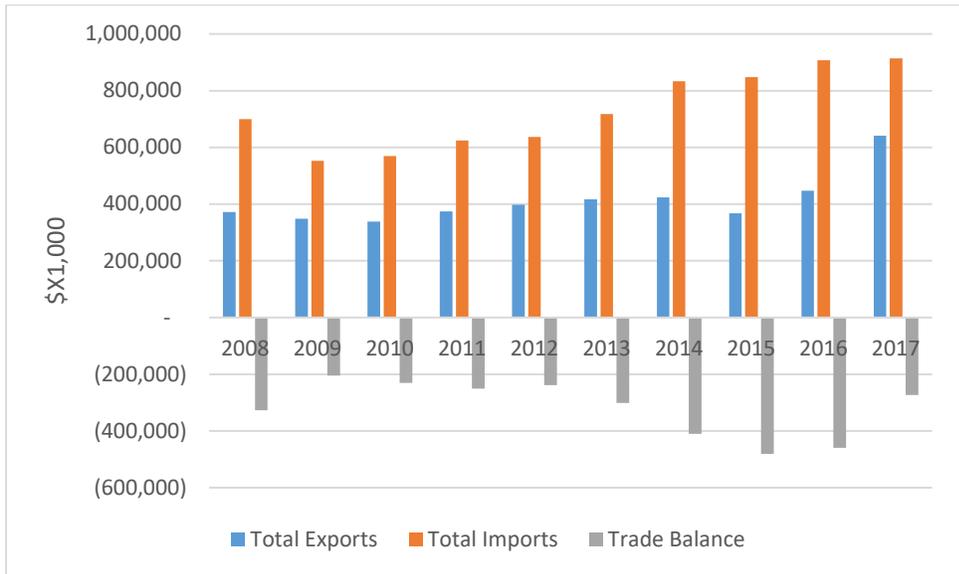


Source: Statistics Canada Table 36-10-0489-01 & 16-10-0047-01 (formerly CANSIM 383-0031 & 304-0014)

Canada is a net importer of dairy products, (refer to Figure 3.5) in 2017 it exported dairy products worth \$640.9 million and imported dairy products worth \$914.2 million. Canada exports 57% of manufactured dairy products to the United States, 5% to Algeria and 4% to

Egypt. The United States, Italy and New Zealand are the most important countries for manufactured dairy product imports accounting for 58%, 8% and 8% respectively of dairy product imports.

Figure 3.5 Canada Dairy Product Manufacturing Imports, Exports and Trade Balance (\$)

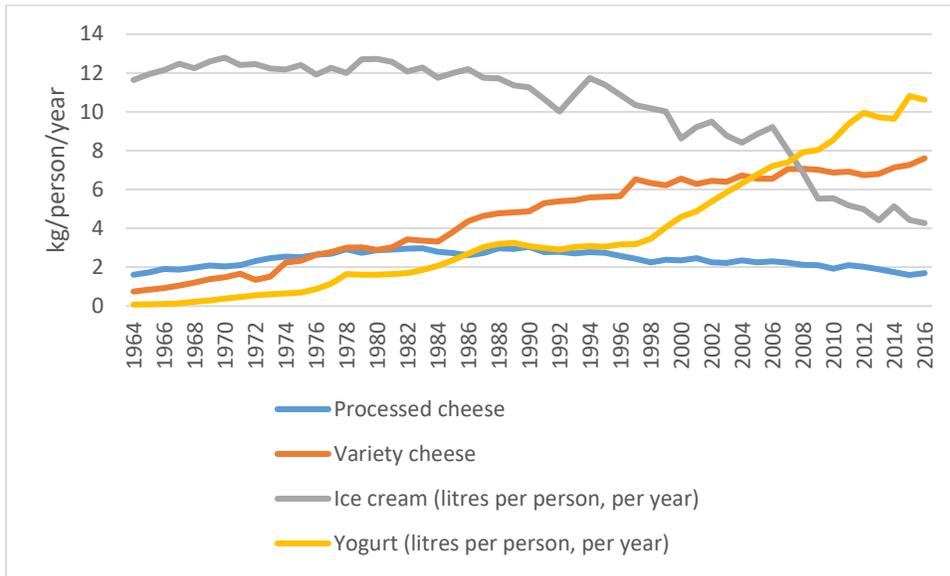


Source: Innovation, Science and Economic Development Canada Online data, 2018

Dairy consumption is stagnant, however, growth is largely driven by positive trends in consumption of butter, yoghurt and specialty cheeses, while consumption of ice cream and processed cheese is declining. Growing health consciousness hampers the growth of processed cheese while supporting the growth of unprocessed cheese (Euromonitor, 2016).

Canada’s dairy production is primarily to meet domestic requirements however, Canada’s ageing population, consumer health concerns and the growth in competing products and a lack of innovation, limit market growth. New trade agreements like CETA provide processors with an opportunity to increase production. In November 2016, the federal government announced the Dairy Processing Investment Program to support access to technical expertise and the purchase of new equipment to expand processing capacity, enhance efficiency and productivity and diversify product lines to maintain and capture new market opportunities (AAFC, 2016). To increase sales companies are seeking growth opportunities outside North America, for example, Saputo has subsidiaries in a number of countries including U.S. and Argentina. Saputo closed manufacturing plants in some provinces (Nova Scotia, Alberta, Quebec and Ontario) to reduce cost. Saputo is expanding goat cheese production, its emphasis on cheese production is partially due to its Quebec roots. The growing snacking trend increases demand for cheese. Saputo produces private label cheese for Loblaw and Sobeys. It developed a line of reduced fat and sodium mozzarella in response to increased health demand (Euromonitor, 2016).

Figure 3.6 Food Available in Canada, Annual Kilograms per Person



Source: Statistics Canada Table 32-10-0054-01 (formerly CANSIM 002-0011)

Kraft is a strong player in terms of innovation, packaging resizing (mostly downsizing) and new product launches, e.g. in 2014 it launched Philadelphia Jalapeno cream cheese. New sophisticated and cost-effective technology allow milk and cheese processors to develop high-quality functional products. For instance, Agropur developed a new brand, Iögo, through a joint venture between Agropur Cooperative and Agrifoods International Cooperative. Iögo is promoted as a yoghurt that is free from gelatin, artificial colours and flavours. Iögo brand includes spoonable yoghurt and drinking yoghurt including reduced fat and artificial varieties (Euromonitor, 2016).

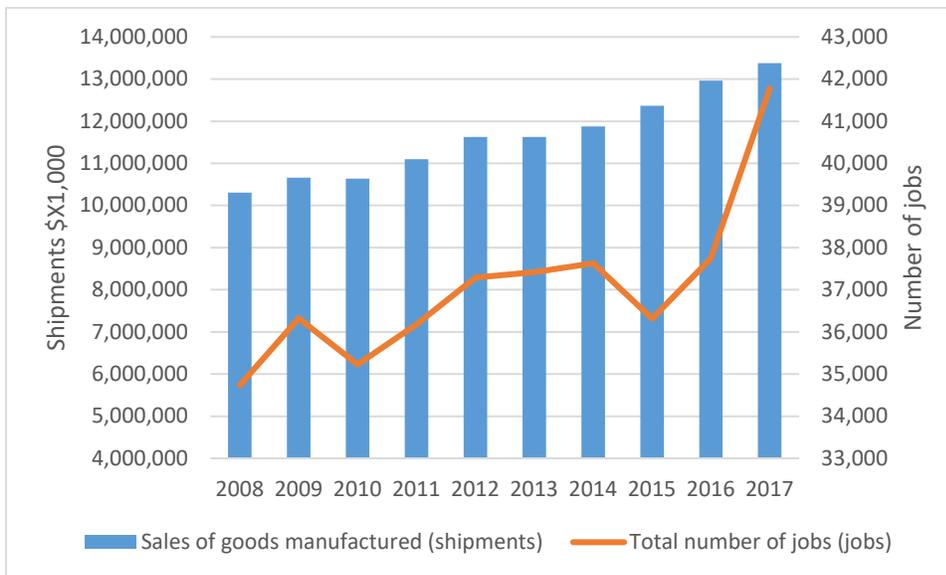
Baby food sales are increasing very fast as consumers are gravitating towards organic baby food as well as premium high-priced baby foods. Low birth rate limits demand growth while expansion in organic offerings supports growth. Nestlé Canada, Mead Johnson Nutrition, Abbott Laboratories and H J Heinz Co remain the major four players accounting for 77% of value share (Euromonitor, 2016). Baby food has two major markets, which is milk formula and baby food other than milk formula. Nestlé Canada, Mead Johnson Nutrition and Abbott Laboratories have a strong presence in milk formula, the three combined accounted for 89% of retail sales in 2016 (Euromonitor, 2016). The major baby food processors enjoy wide distribution across retail channels and geographies across Canada. Nestlé is the leader in organic baby food, but its market share declined due to its decision to exit prepared baby food (particularly purée) in 2013/2014. Private labels such as Loblaw’s President Choice brands have a strong focus on organic and have a wide distribution through Shoppers Drug Mart and many banners it owns (Euromonitor, 2016).

3.4 Beverage Manufacturing (Canadian)

The beverage industry can be divided into two categories, i.e. alcoholic and non-alcoholic beverages. The supply chain includes producers, processors, distributors, commercial partners, consumers and the government. Processors include facilities that make juice, carbonated soft drinks, bottled water, wineries, breweries, distilleries, bottlers and packers. The main distributors are provincial liquor boards, retail chains and restaurants (Parliament of Canada, 2013). Quebec, Ontario and British Columbia are home to 90% of beverage manufacturing facilities in Canada.

In 2017, beverage and tobacco manufacturing employed 41,780 people, (it is the third largest food and beverage manufacturing employer) accounting for 16% of total food and beverage manufacturing employment. Beverage manufacturing generated shipments valued at \$13.4 billion in 2017, which accounted for 12% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

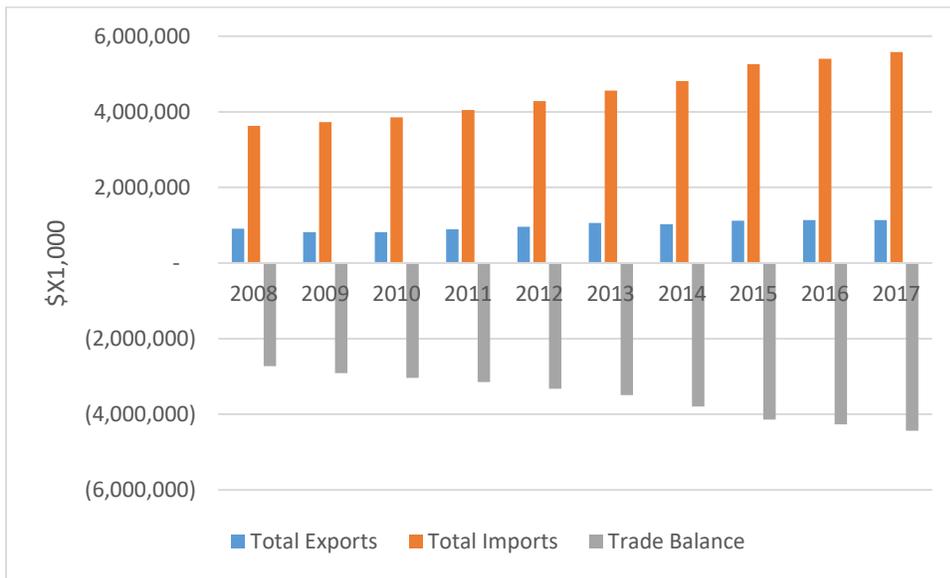
Figure 3.7 Canada Sales of Manufactured Beverage and Tobacco Products (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0047-01 (formerly CANSIM 383-0031 & 304-0014)

Canada is a net importer of beverages (see Figure 3.8). In 2017 exports were worth \$1.1 billion and imports were worth \$5.6 billion. The United States 84%, Vietnam 5% and China 3% are the most important countries for beverage exports. Approximately 60% of beverages are imported from the United States (35%), France (13%) and Italy (11%). In the last ten years, the trade deficit has increased by 63% from \$2.7 billion in 2008 to \$4.4 billion in 2017. Imports have increased by 54% from \$3.6 billion in 2008 to \$5.6 billion in 2017, whereas exports have only grown by 26% from \$906.3 million in 2008 to \$1.1 billion in 2017.

Figure 3.8 Canada Beverage Manufacturing Imports, Exports and Trade Balance (\$)



Source: Innovation, Science and Economic Development Canada Online data, 2018

Alcoholic drinks include beer, cider/Perry, and ready to drink/high strength premixes, spirits, wine and other alcoholic drinks. Anheuser-Busch InBev NV and Molson Coors Brewing Co. are the main players for alcoholic drinks, they account for 32.9% and 24.7% respectively of the total volume of alcohol production (Euromonitor, 2016). Other notable companies include Diageo Plc, Heineken NV, Andrew Peller Ltd, Constellation Brands Inc, Accolade Wines Ltd, SABMiller Plc and Pernod Ricard Groupe, each contributing less than 3% to total volume (Euromonitor, 2016).

Beer is the most popular of all alcoholic drinks in terms of volume and value; Labatt Brewing Co. Ltd and Molson Canada have a combined 80% share of volume of sales (AAFC, 2013). Beer is a mature market, share of sales are gradually shrinking due to the rising craft beer movement. Microbreweries are increasing across Canada with large players like Molson Canada investing in craft breweries. Labatt is working on diversifying away from the mature North American market particularly seeking growth in Africa. Labatt has strengthened its business with acquisitions in organic beer, craft beer and hard cider. New product launches such as vintage products, new craft beers, new flavours and new innovative packaging, reduced calories and no additives/preservatives drive beer consumption (Parliament of Canada, 2013).

Canada is not a major wine producer by global standards, nonetheless, Canada is one of the world's largest ice wine producers. The sector generates employment through agricultural production, manufacturing and tourism (AAFC, 2013). Interprovincial barriers to marketing, distribution and costly shelf space limit competitiveness in the wine industry. Importation of Intoxicating Liquors Act was amended in June 2012, making it possible to import wines across provincial borders, nevertheless, provinces comply at varying levels, which presents itself as a barrier. Canadian wines have less space in provincial liquor stores than foreign wines (Parliament of Canada, undated). Lack of regulation in labelling can result in misleading labels.

Some wines are labelled cellared in Canada when 70 to 90% of grapes are foreign (Parliament of Canada, undated). Innovation such as wine tourism used as a mechanism for promoting wines helps grow the industry. Canada's VIA Rail exclusively offers Canadian wines (Parliament of Canada, 2013).

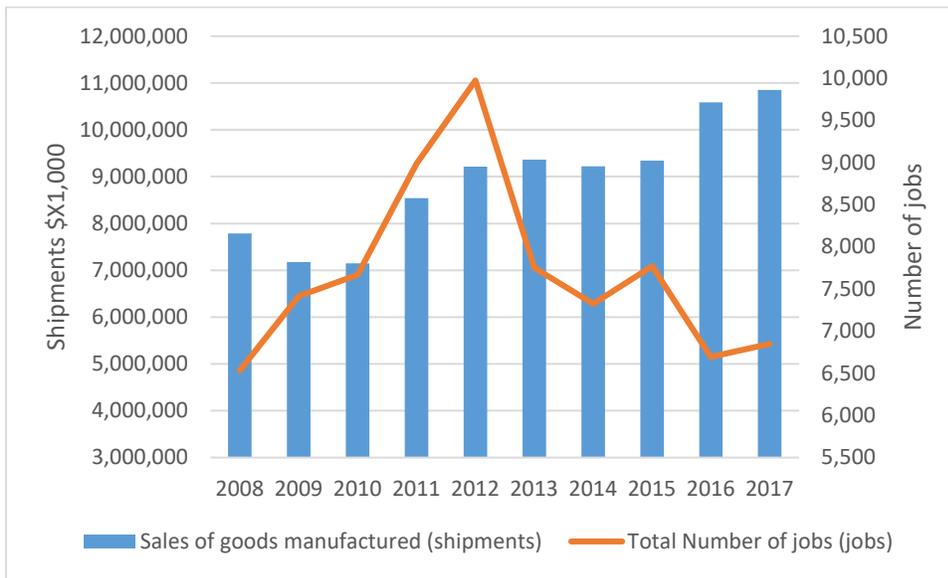
Soft drink manufacturing is highly concentrated and consists of a variety of non-alcoholic carbonated beverages, including fruit flavoured drinks, colas, ginger ales, ginger beer, root beers, ready to drink iced tea and coffee, soda waters, tonic waters, sport and energy drinks and relaxation drinks. The top three soft drink manufacturers are PepsiCo Beverages Canada, Coca-Cola Ltd and Nestlé Canada accounting for 15.5%, 14.4% and 12.8%, respectively, of the retail market value of soft drinks. Increasing consumer demand for healthier beverages due to concerns about sugar intake and artificial ingredients has resulted in a number of innovations. Carbonated drink manufacturers have developed innovative products such as ready to drink low-calorie beverages as well as vitamin and coconut water products (AAFC, 2016). Furthermore, manufacturers of bottled water have developed bottled water brands, and are expanding their offerings with flavoured water lines. Coca-Cola Ltd and PepsiCo Beverages Canada Ltd are the top two players in better for you beverages, the focus is on low calorie, reduced sugar. Both companies leverage their strength in marketing and product distribution across major channels. Their extensive reach and access to all distribution channels allow them to experiment with new products at a faster rate. In 2014, Coca-Cola initiated a partnership with Gilt.com a luxury online retailer. The introduction of the diet coke curated collection highlighted the online shopping trend that included metallic bright reds and blacks and white accents (Euromonitor, 2016). Diversification of product portfolio is important to soft drink manufacturing. Demand for ready to drink coffee and tea is increasing. Low-profit margins for processing plants coupled with stiff competition have led many processing plants to consolidate their operations. Over the last few years, a number of plants have closed or relocated (Parliament of Canada, 2013).

3.5 Grain and Oilseed Milling (Canadian)

Grain and oilseed milling is divided into three main subgroups: flour milling and malt manufacturing, starch and vegetable fat and oil manufacturing and breakfast cereal manufacturing. Grain and oilseed products often go to secondary processors such as a bakery or snack food manufacturers. Canola crushing has experienced prominent growth. In 2017, grain and oilseed milling employed 6,850 people, accounting for 3% of total food and beverage manufacturing employment (refer to Figure 3.9). Grain and oilseed milling generated shipments valued at \$10.8 billion in 2017, which accounted for 9% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

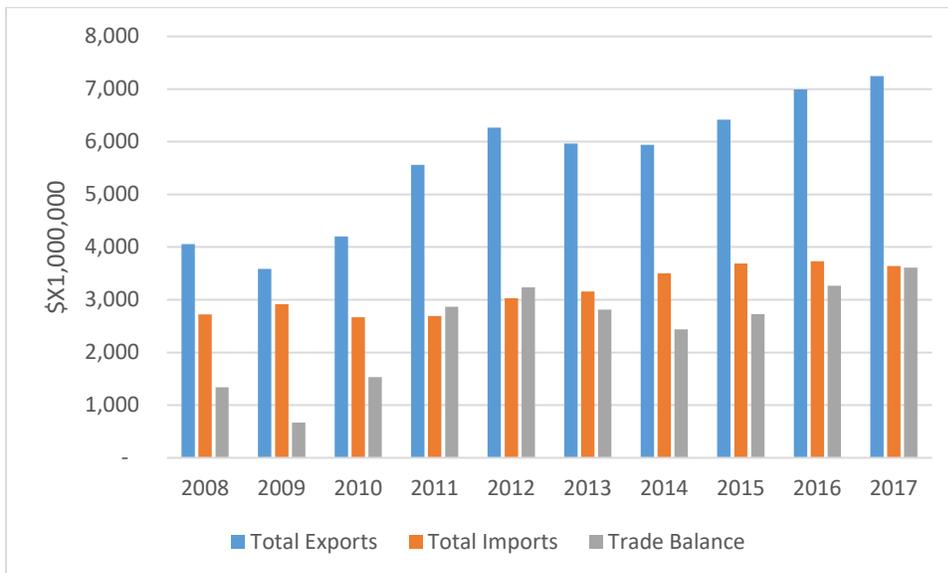
Consumer health concerns have resulted in reduced consumption of oils and fats, and an increased consumption of rice over wheat. Food made with whole grains such as bread and pasta are increasingly popular as they are considered healthy (AAFC, 2016). Concerns about sugar intake and rising demand for on the go convenience have a negative impact on breakfast cereal growth.

Figure 3.9 Canada Sales of Manufactured Grain and Oilseed Products (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0047-01 (formerly CANSIM 383-0031 & 304-0014)

Figure 3.10 Canada Grain and Oilseed Milling Imports, Exports and Trade Balance (\$)



Source: Innovation, Science and Economic Development Canada Online data, 2018

Grain and oilseed manufacturing is a net exporter, exports have increased substantially (increased by 79%) from \$4.1 billion in 2008 to \$7.2 billion in 2016 (refer to Figure 3.10). The United States 73%, China 15% and Mexico 3% are the most important countries for grain and

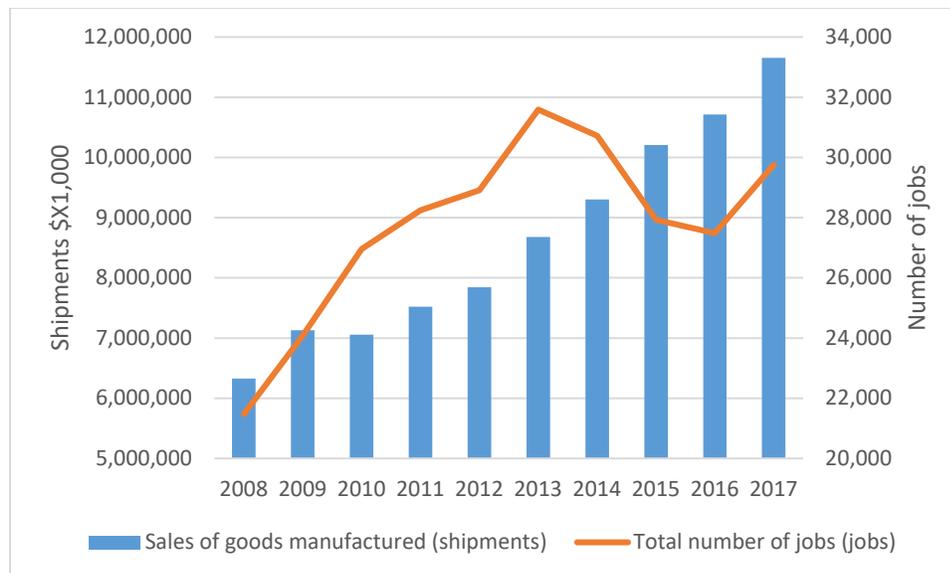
oilseed manufacturing exports. The three most important countries for grain and oilseed manufacturing imports are the United States 69%, Italy 4% and Malaysia 4%.

Kellogg Canada 39.5%, PepsiCo Beverages Canada 15.9%., General Mills 13.6% and Post Holdings 8.1% are the leading breakfast cereal manufacturers in Canada in terms of market share. A growing number of options for breakfast, concerns about sugar intake and rising demand for on the go convenience have a negative impact on growth. Kellogg is facing competition from Tim Hortons and MacDonald’s breakfast sandwiches and protein-packed items such as Greek yoghurt. Kellogg has invested in a turnaround plan, which includes new products with a focus on health and wellness such as Special K Protein, and Special K Nourish as well as Kashi products that are GMO-free (Euromonitor, 2016). Kellogg’s advertisement campaigns highlight its products weight control benefits as well as wholesome and natural ingredients. Kellogg has also developed convenient size ready to eat cereals. In 2014, Kellogg closed its manufacturing plant in London quoting lack of demand based on changing habits of consumers. The Globe and Mail in May 2015 cited lack of resonance with young generations as another challenge for Kellogg.

3.6 Other Food Manufacturing (Canadian)

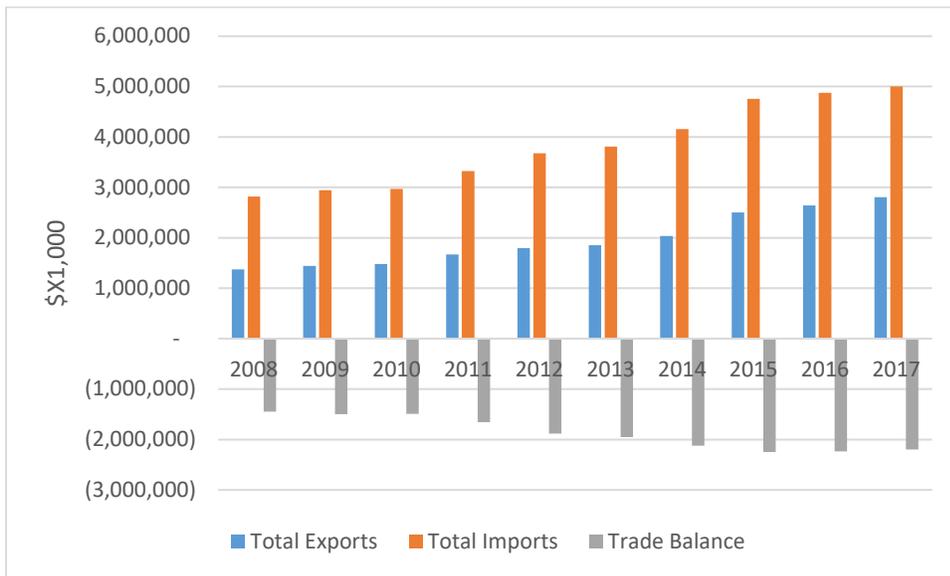
Other food includes snack food, roasted nut and peanut butter, coffee and tea manufacturing, flavouring syrup and concentrate, seasoning and dressing and all other food manufacturing. In 2017, other food manufacturing employed 29,760 people, accounting for 11% of total food and beverage manufacturing employment. Other food manufacturing generated shipments valued at \$11.7 billion in 2017, which accounted for 10% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

Figure 3.11 Canada Sales of Manufactured Other Food (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0047-01 (formerly CANSIM 383-0031 & 304-0014)

Figure 3.12 Canada Other Food Manufacturing Imports, Exports and Trade Balance (\$)



Source: Innovation, Science and Economic Development Canada Online data, 2018

Other food manufacturing is a net importer. The United States accounts for 75% of imports while China and Italy combined account for 4% of imports for other food manufacturing. The most important countries for other food manufacturing exports are the United States 90%, South Korea 1% and Japan 1%.

Snack foods are widely available in all retail channels. Innovations include new ingredients such as hemp seeds, grains and pulses and less salt, reduced fat, new flavours and gluten free and snacks targeted at certain religions e.g. kosher and halal (AAFC, 2016).

Kraft-Heinz, McCormick, Unilever and Frito-Lay account for over 50% of market share of sauces, dressing and condiments, with remaining divided among several small and medium-sized companies. Barriers to entry are low but access to major grocery stores and mass merchandisers is limited by sales volume requirement (Euromonitor, 2016). The health and wellness trend has influenced sauces, dressing and condiments (consumers demand products with low fat, low sugar, low sodium without additives and preservatives). Consumers are switching to new flavours rather than traditional ones. Herbs and Spices are the top-performing category. Kraft and Heinz Co. merged in 2015, they have a combined retail sales value share of 25%. Kraft Canada is the category leader for mayonnaise and salad dressing. In 2015 Kraft's share declined slightly as consumers were switching to either high-end premium sauces or cheaper economy private label brands. Kraft and Heinz Co. is popular for Heinz ketchup. Promotions include upside-down squeeze bottle and packaging (Euromonitor, 2016).

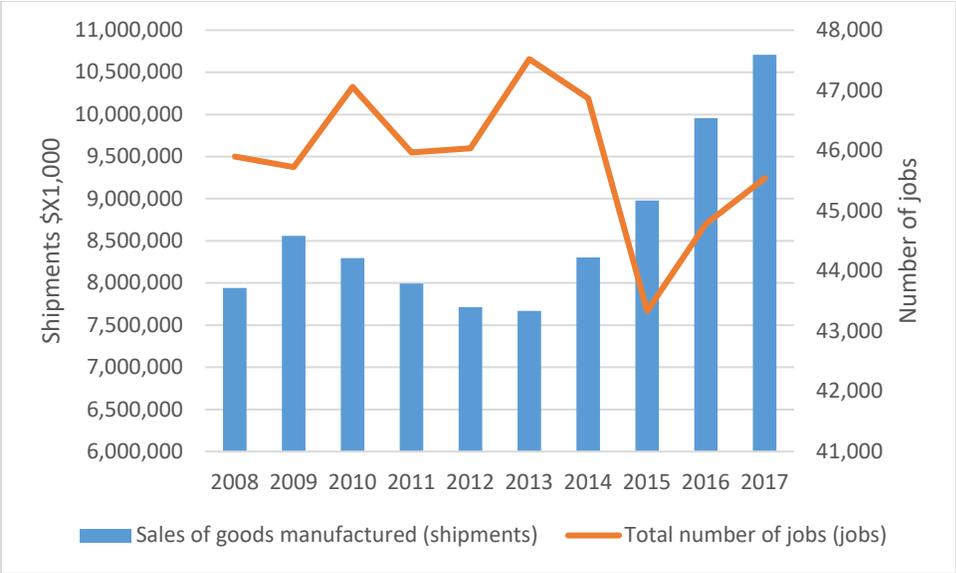
Fresh ground coffee is popular and stimulates sales value. Consumers demand a wider variety and specialty coffee. Keurig Canada Inc. and Kraft Canada lead the category accounting for 33% and 25% respectively, retail value sales. Keurig Canada enjoyed significant growth in years prior

to 2014 driven by sales of its brewing system and pods that fit these systems. Since the loss of patent protection for its brewing system in 2012, the company has been facing increasing challenges. Private label brands like Starbucks brands accounted for 54% of retail sales volume in 2015 supported by its partnership with PepsiCo (Euromonitor, 2016). High quality and unique experiences drive sales growth of specialty tea such as fruit and herbal tea (Euromonitor, 2017).

3.7 Bakeries and Tortilla Manufacturing (Canadian)

Bakery and tortilla manufacturing is the second largest (after meat product manufacturing) food and beverage manufacturing employer. In 2017, bakeries and tortilla manufacturing employed 45,540 people, accounting for 17% of total food and beverage manufacturing employment. In 2017, bakeries and tortilla manufacturing generated shipments valued at \$10.7 billion, which accounted for 9% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

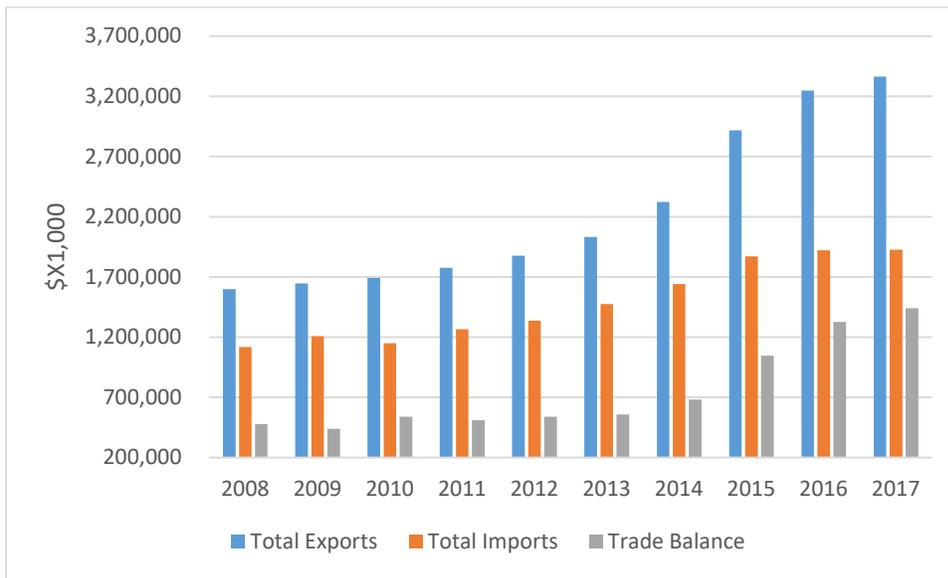
Figure 3.13 Canada Sales of Manufactured Bakeries and Tortilla (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0047-01 (formerly CANSIM 383-0031 & 304-0014)

Bakeries and tortilla manufacturing is a net exporter, the most important countries for exports are the United States 97%, United Kingdom 1% and Australia 0.4%. The most important countries for bakeries and tortilla manufacturing imports are the United States 71%, Italy 5% and Mexico 3%.

Figure 3.14 Canada Bakeries and Tortilla Imports, Exports and Trade Balance (\$)



Source: Innovation, Science and Economic Development Canada Online data, 2018

Baked goods are growing in volume and value. Consumer demand for the natural and healthy food drive growth in goods with claims such as added fiber, wholegrain, flatbreads and gluten-free. The unit price of baked goods is increasing due to inflation, a weaker Canadian dollar and a shift towards high-quality artisanal foods. George Weston Limited and Canada Bread Co. remain the top two baked goods players with 12% and 11% value shares respectively in 2015. George Weston Limited and Canada Bread Co. are expected to remain the largest. Their leadership positions are continually being challenged by smaller artisanal and specialty bakeries and those focusing on health benefits like gluten-free. The industry is relatively fragmented with no other single player commanding a share higher than 10%. George Weston bakery products are mostly distributed through Loblaw and its various banners that are also part of the company. George Weston has also been actively expanding through mergers and acquisitions (Euromonitor, 2016).

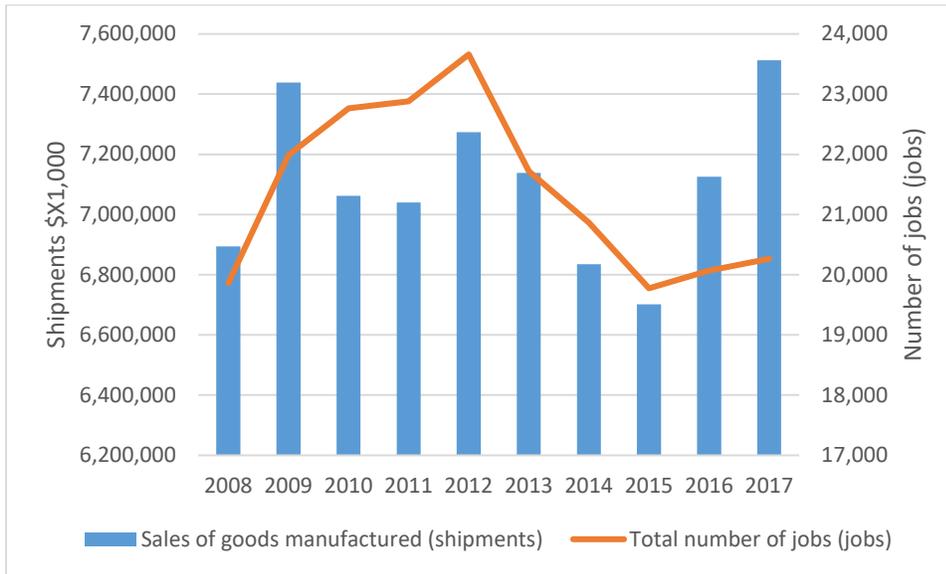
Ethnic shoppers and health enthusiasts are helping sustain growth in pasta consumption. Catelli Foods Coop leads this category with 18% value share due to its strong presence in pasta. Gluten-free continues to be a strong area of growth (Euromonitor, 2016).

3.8 Fruit and Vegetable Preserving and Specialty Food Manufacturing (Canadian)

Fruit and vegetable preserving and specialty food are comprised of establishments primarily engaged in manufacturing frozen fruit and vegetables, frozen entrees and side dishes and fruits and vegetables preserved by pickling, canning, dehydration and similar processes. In 2017, fruit and vegetable preserving and specialty food manufacturing employed 20,265 people, accounting for 8% of total food and beverage manufacturing employment. In 2017, fruit and vegetable

preserving and specialty food manufacturing generated shipments valued at \$7.5 billion, which accounted for 7% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

Figure 3.15 Canada Sales of Manufactured Fruit and Vegetable Preserving and Specialty Food (Shipments and Jobs)



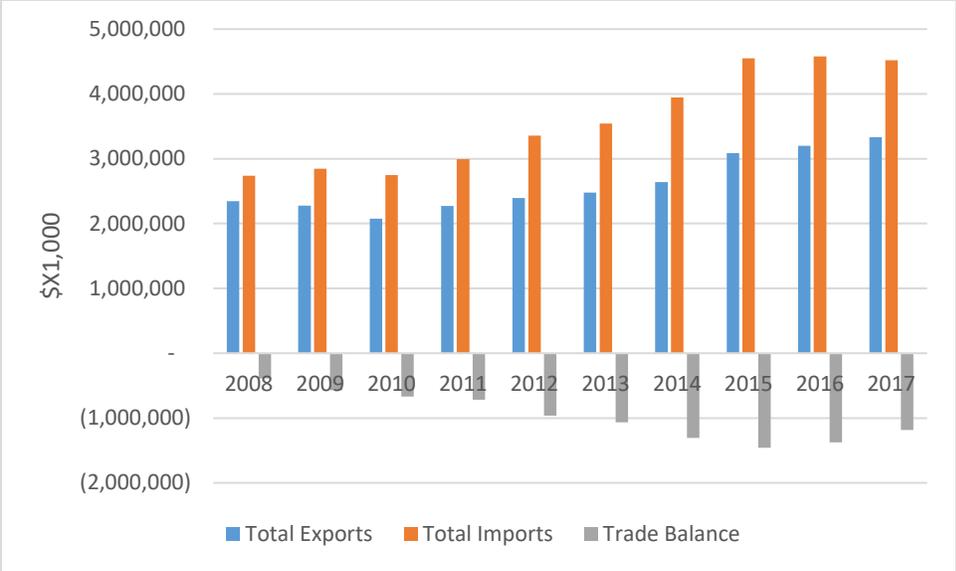
Source: Statistics Canada Table 36-10-0489-01 & 16-10-0047-01 (formerly CANSIM 383-0031 & 304-0014)

Fruit and vegetable preserving and specialty food manufacturing is a net importer. In the past ten years, the trade deficit has more than tripled from \$388.6 million in 2008 to \$1.2 billion in 2017. The United States, China and Brazil are the most important countries for imports accounting for 62%, 7% and 4% respectively. The most important countries for fruit and vegetable preserving and specialty food manufacturing exports are the United States 83%, Japan 2% and South Korea 1%. Frozen potato products, mainly French fries, lead exports.

Growth is driven by convenience factor and rising demand for healthy foods. Frozen fruit performs well. General Mills Canada Corp has a value share of 12%, ConAgra Foods and McCain Foods are close contenders. The market is fragmented and competition is tight. In September 2015 General Mills announced the sale of Green Giant brand and Le Sueur business, the company is shifting its focus to cereal and yoghurt while concentrating on its small but growing organic and natural foods division. McCain Foods has been active in new product development and marketing. Yves Veggie Cuisine is the clear leader for meat substitutes. In 2016, it launched new patties from kale, carrots and potatoes targeting vegetarians and flexitarians (Euromonitor, 2016).

Campbell Soup Co. is the leader in this category with a 61% value share attributed to its wide range of soup products. The company is losing market share to some low priced private products and smaller competitors offering options perceived as healthier and high quality. Lower interest from millennials hampers growth (Euromonitor, 2016).

Figure 3.16 Canada Fruit and Vegetable Preserving and Specialty Food Manufacturing Imports, Exports and Trade Balance (\$)



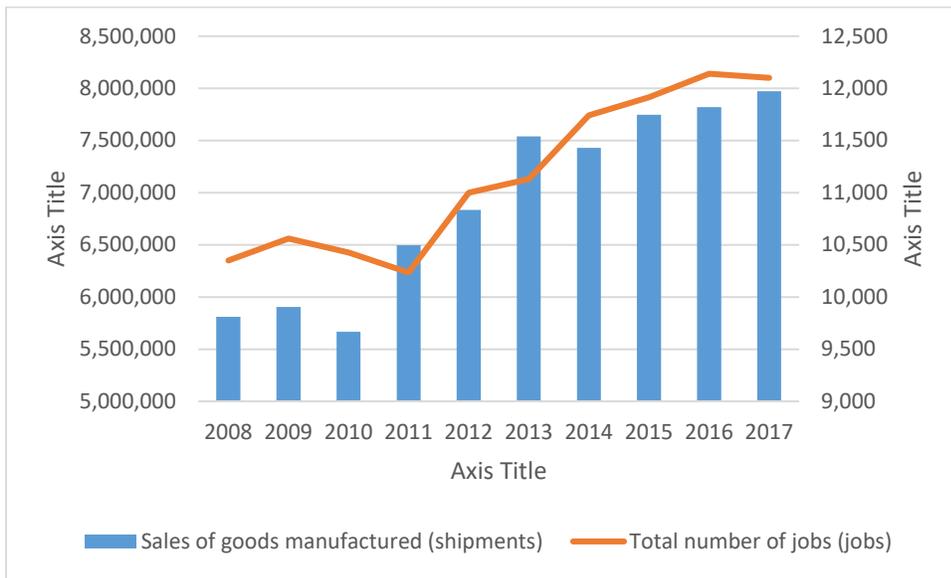
Source: Innovation, Science and Economic Development Canada Online data, 2018

3.9 Animal Food Manufacturing (Canadian)

Animal food manufacturing comprises establishments primarily engaged in manufacturing food and feed for animals including pets. In 2017, animal food manufacturing employed 12,100 people, accounting for 5% of total food and beverage manufacturing employment. Animal food manufacturing generated shipments valued at \$7.9 billion in 2017, which accounted for 7% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

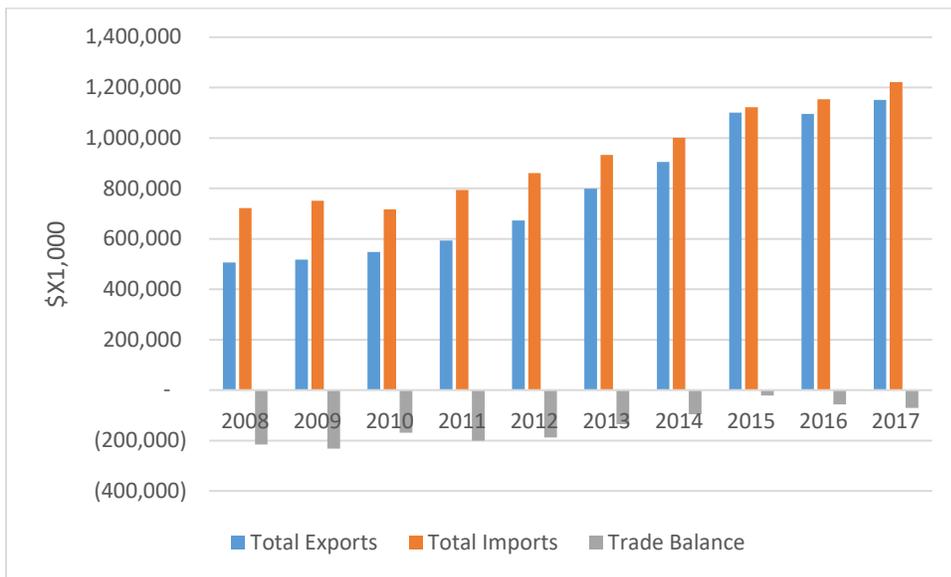
Animal food manufacturing is a net importer, nonetheless, trade balance decreased by 67% from \$216.3 million in 2008 to \$70.1 million in 2017. The most important countries for animal food manufacturing exports are the United States 57%, Russia 5% and Japan 4%. The most important countries for animal food manufacturing imports are the United States 88%, China 3% and Thailand 2%.

Figure 3.17 Canada Sales of Manufactured Animal Food (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0047-01 (formerly CANSIM 383-0031 & 304-0014)

Figure 3.18 Canada Animal Food Manufacturing Imports, Exports and Trade Balance (\$)



Source: Innovation, Science and Economic Development Canada Online data, 2018

Price premiums and humanization drive sales of dog food (Euromonitor, 2016). Pet food volume and value is increasing; Nestlé Purina Pet Care Co, Mars Canada Inc. and DLM Foods Canada

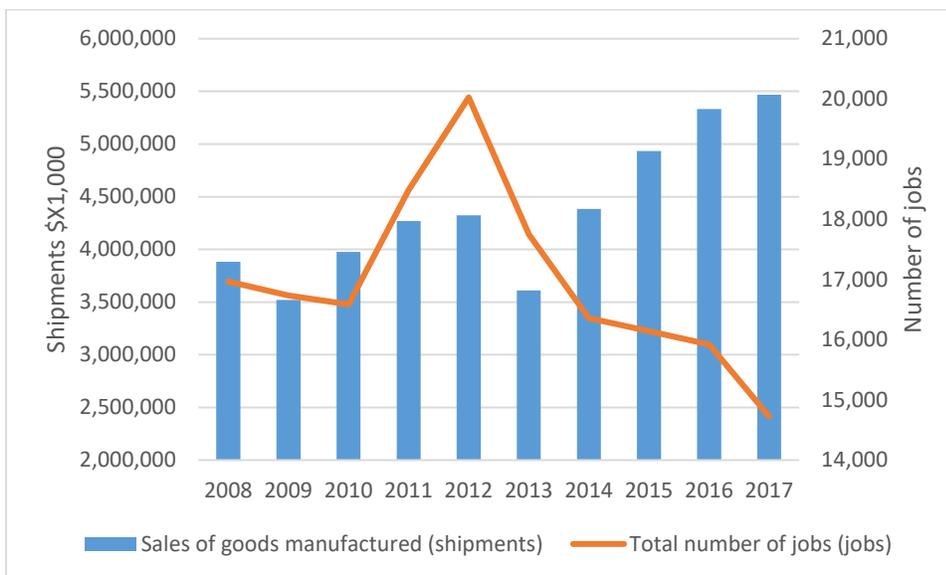
Coop continue to lead this category with 28%, 24% and 12% retail value shares respectively. These brands are available in most retail channels including independent small grocers, hypermarkets and pet stores which makes it easy and convenient for consumers to buy them (Euromonitor, 2016). Nestlé’s strong performance is attributed to a broad portfolio of brands in different price tiers, its strong market penetration and high brand awareness. (Euromonitor, 2016).

3.10 Seafood Product Preparation and Packaging (Canadian)

Seafood product preparation and packaging industry consist of establishments that are primarily engaged in canning seafood, including soup, smoking, salting, drying seafood, preparing fresh fish by removing heads, fins, bones and entrails, shucking and packing fresh shellfish, processing marine fats and oils and freezing seafood (AAFC, 2016). Canada is the world’s largest producer and exporter of Atlantic lobster and eighth largest seafood exporter (AAFC, 2016).

Approximately 70% of total fish and seafood production is exported. In 2017, seafood product preparation and packaging employed 14,725 people, accounting for 6% of total food and beverage manufacturing employment. In 2017, seafood product preparation and packaging generated shipments valued at \$5.5 billion, which accounted for 5% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

Figure 3.19 Canada Sales of Seafood Product Preparation and Packaging (Shipments and Jobs)

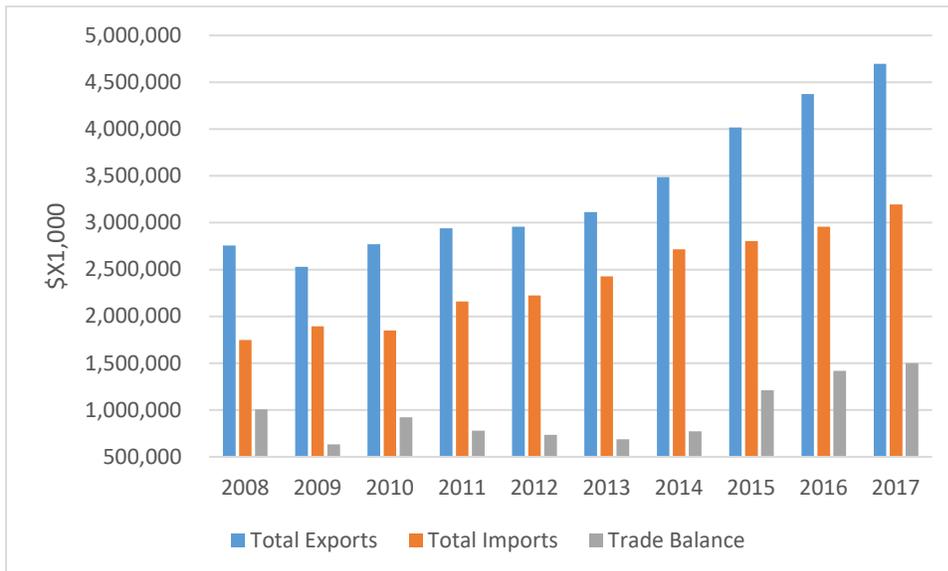


Source: Statistics Canada Table 36-10-0489-01 & 16-10-0047-01 (formerly CANSIM 383-0031 & 304-0014)

2016 data on seafood product preparation and packaging industry suppressed shipment data from Nova Scotia, Newfoundland and Labrador and British Columbia which would lead one to come to wrong conclusions (that production in these provinces is insignificant). The Atlantic and Pacific commercial ocean fisheries are the largest contributors to production followed by aquaculture and freshwater fisheries. Shellfish represent 53% of ocean fishery harvest, pelagic fish (e.g. salmon and tuna) 24% and groundfish (e.g. cod, haddock) 21%. Freshwater fish represent 7% of total wild harvest production, the majority are sourced from lakes in Ontario and Manitoba (AAFC, 2016).

Seafood product preparation and packaging is a net exporter. The United States 57%, China 14% and Japan 6% are the most important countries for seafood products manufacturing exports. The most important countries for seafood products manufacturing imports are the United States 24%, China 17% and Thailand 11%.

Figure 3.20 Canada Seafood Product Manufacturing Imports, Exports and Trade Balance (\$)



Source: Innovation, Science and Economic Development Canada Online data, 2018

High Liner Foods is the clear leader in frozen seafood followed by Nippon Suisan Inc. and its Blue Water Brand. In shelf-stable seafood Clover Leaf Seafoods Inc. and Canadian Fishing Co. lead the market. High Liner bought four of its major competitors in six years, company sales went from \$300 million in 2007 to \$1.2 billion in 2013⁸ (Euromonitor, 2016).

Sustainable production is a major challenge in seafood production. Sustainable wild seafood has a lower carbon footprint, lower freshwater use, and lower feed use. Retail has driven the sustainability movement. The Marine Stewardship Council is the international body working towards implementing sustainable fishing practices around the world. Sustainability comes with

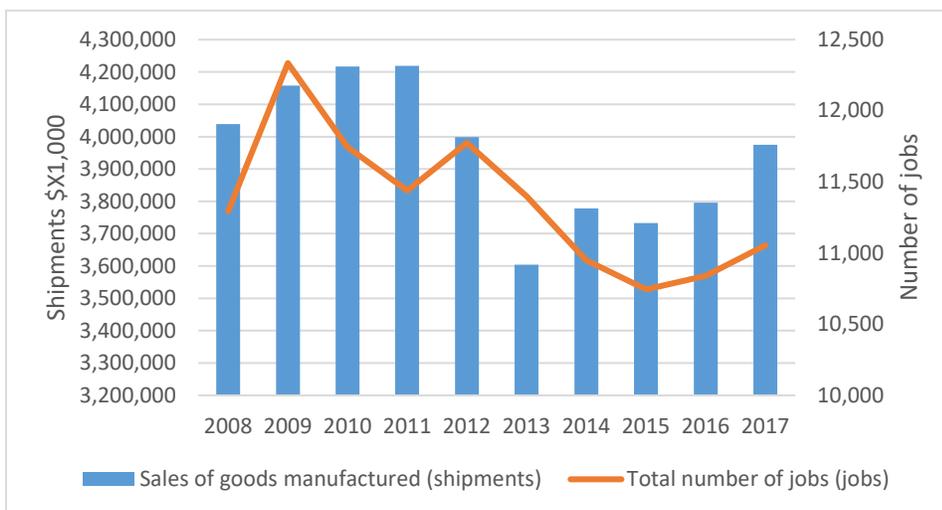
⁸ Canada's food and beverage processing magazine: Oceans of opportunity
<http://www.foodincanada.com/features/oceans-opportunity/>

a financial cost. Some acquisitions have positive results, for example, the acquisition of Janes by Sofina gave Sofina access to a wide range of experienced professionals, access to manufacturing facilities across Canada and ability to pull together promotions among complementary brands. The Association of Seafood Producers advocates for consolidation, which they state is good for the industry because Canada seafood is small scale compared to its competitors. For instance, Alaska has a crab fishery with four major ports while Canada has around two hundred ports. Plants are closing, particularly in shrimp as the quota reduces. Aquaculture is often criticized for waste, pollution and spread of a disease that can be associated with fish farming. Janes brand does not use farmed fish. Innovation includes smaller package sizes, fish tacos and fish bites that work well as a finger food. Clearwater’s new products include scallops and sauce and bacon-wrapped sea scallops (Canada Food and Beverage Processing Magazine, 2013).

3.11 Sugar and Confectionery Manufacturing (Canadian)

Sugar and confectionery manufacturing comprises establishments primarily engaged in manufacturing products such as sugars, chewing gum, cough drops, granola bars, chocolate bars, licorice and hard candy. Foreign ownership is high, the major multi-national confectionery manufacturers (Mars Inc, Mondelez International, Nestlé, Hershey Co. and Ferrero Group) have manufacturing plants in Canada. Sugar-free confectionery is the largest growing segment and its innovations include the use of natural ingredients. In 2017, sugar and confectionery manufacturing employed 11,055 people, accounting for 4% of total food and beverage manufacturing employment. In 2017, sugar and confectionery manufacturing generated shipments valued at \$3.9 billion, which accounted for 3% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

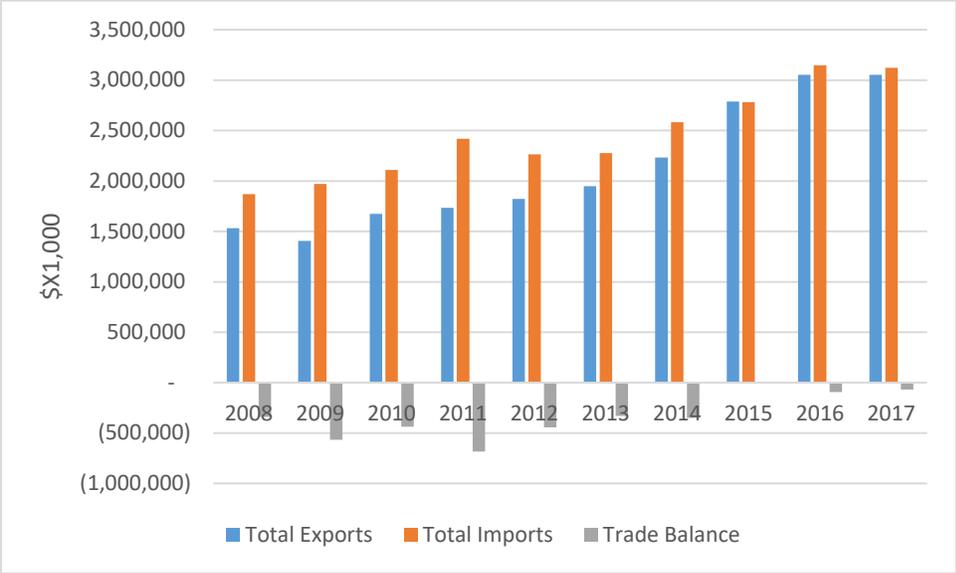
Figure 3.21 Canada Sales of Manufactured Sugar and Confectionery (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0047-01 (formerly CANSIM 383-0031 & 304-0014)

Canada is a net importer of sugar and confectionery products nonetheless, trade balance decreased almost five times from \$338.7 million in 2008 to \$68.6 million in 2017. The most important countries for sugar and confectionery products exports are the United States 94%, Mexico 1% and South Korea 1%. The most important countries for sugar and confectionery products imports are United States 47%, Brazil 15% and Mexico 4%.

Figure 3.22 Canada Sugar and Confectionery Product Manufacturing Imports, Exports and Trade balance (\$)



Source: Innovation, Science and Economic Development Canada Online data, 2018

Confectionery prices increased due to the 2014/2015 shortage of Cocoa supply and currency movements. Nestlé Canada and Hershey Canada continued to lead with 15% and 14% of retail sales value in 2015 followed by Adams Cadbury Canada (13%). The three major companies launched new products and sought growth (Euromonitor, 2016).

Chapter 4: Highlights of Ontario’s Food and Beverage Manufacturing Industry.

4.0 Introduction

Chapter one, two and three discussed trends in food and beverage manufacturing focusing on Ontario and national trends. This chapter provides an in-depth analysis of major trends in Ontario food and beverage manufacturing industries; it examines each of the ten food and beverage manufacturing sub-sectors.

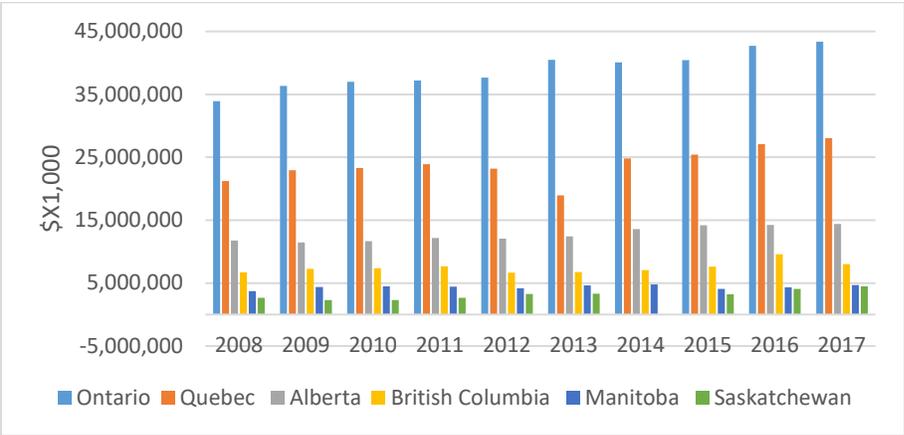
4.1 Comparison of Ontario Food and Beverage Manufacturing Shipments to Other Provinces

Figure 4.1 compares shipments of Ontario to five other provinces (Quebec, Manitoba, Saskatchewan, Alberta and British Columbia). Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick were not included in this analysis because Statistics Canada suppressed shipment data from 2013 to 2016 to meet confidentiality requirements of the Statistics Act. Yukon, North Western Territories and Nunavut were not included in the analysis because food and beverage shipments data is either not available or has been suppressed.

Ontario is the largest contributor to national total food and beverage manufacturing sales. In 2017, Ontario accounted for 41% of food and beverage manufacturing shipments, Quebec accounted for 26%, Alberta 14%, Manitoba 4%, Saskatchewan 4%, Nova Scotia 2%, Prince Edward Island 1% and British Columbia accounted for 8% of national shipments.

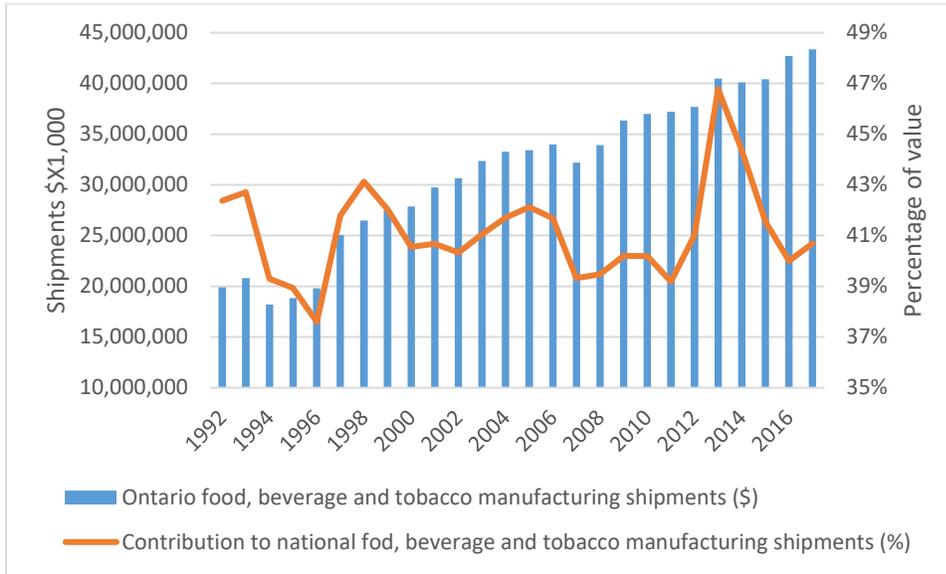
Figure 4.2 illustrates that Ontario food and beverage manufacturing shipments fluctuate from year to year.

Figure 4.1 Sales of Food and Beverage Manufacturing for select Provinces (\$)



Source: Statistics Canada Table 16-10-0048-01 (formerly CANSIM 304-0015)

Figure 4.2 Ontario Food and Beverage Manufacturing Shipments and Contribution to National Shipments

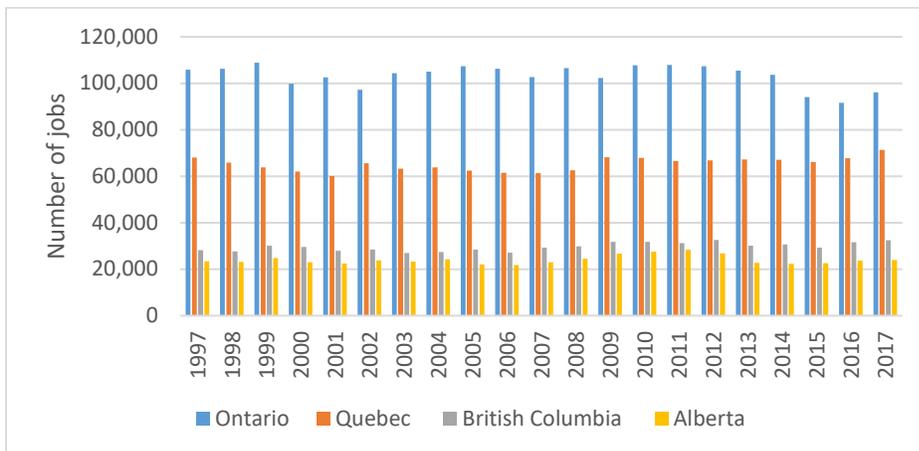


Source: Statistics Canada Table 16-10-0048-01 (formerly CANSIM 304-0015)

4.1.1 Comparison of Ontario Food and Beverage Manufacturing Jobs with other Provinces

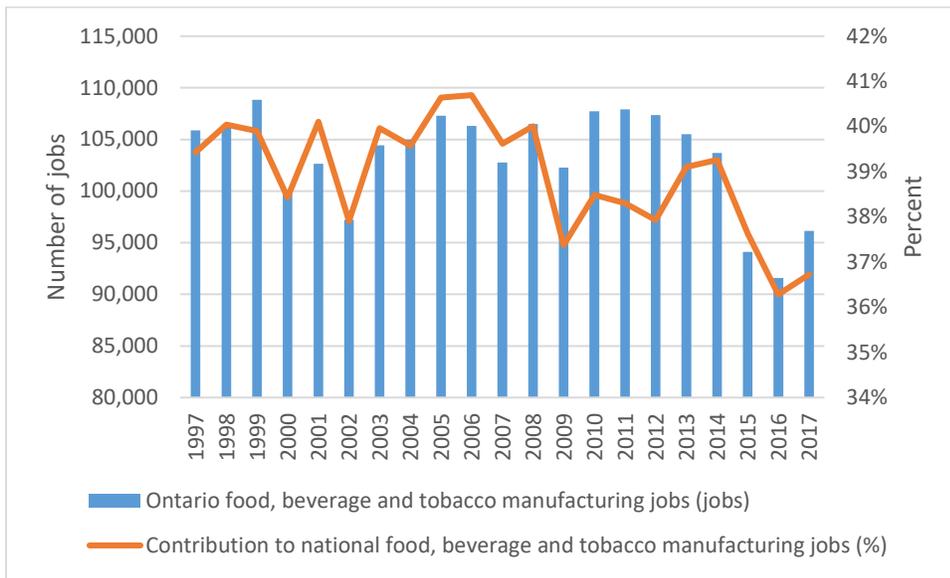
Figure 4.3 and 4.4 illustrate that Ontario accounts for more than one-third of food and beverage manufacturing jobs, however, Ontario’s contribution to total jobs has declined from 41% in 2006 to 35% in 2016.

Figure 4.3 Food and Beverage Manufacturing Jobs Select Provinces



Source: Statistics Canada Table 36-10-0489-01 (formerly CANSIM 383-0031)

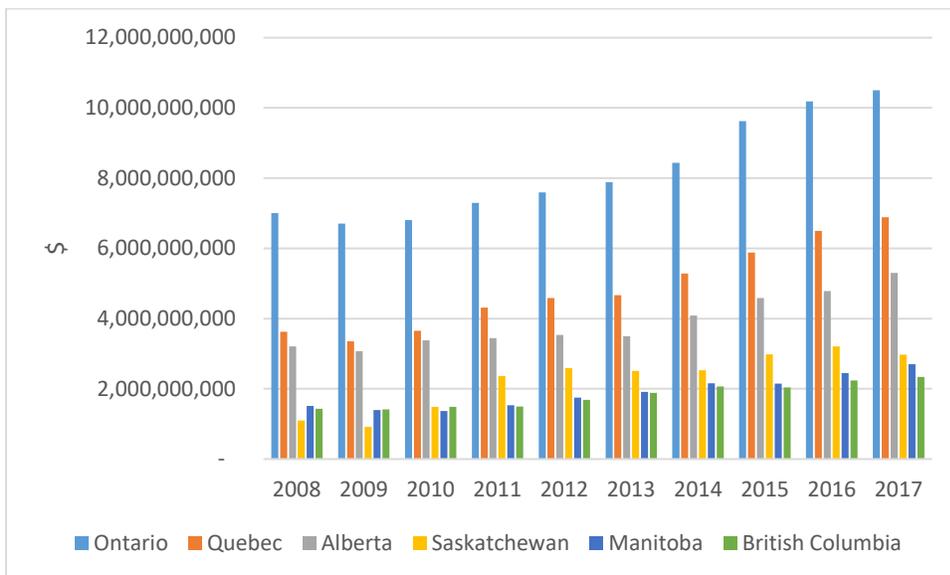
Figure 4.4 Ontario Food and Beverage Manufacturing Jobs and Contribution to National Jobs



Source: Statistics Canada Table 36-10-0489-01 (formerly CANSIM 383-0031)

4.1.2 Comparison of Ontario Food and Beverage Manufacturing Exports with other Provinces

Figure 4.5 Food and Beverage Manufacturing Exports for Select Provinces



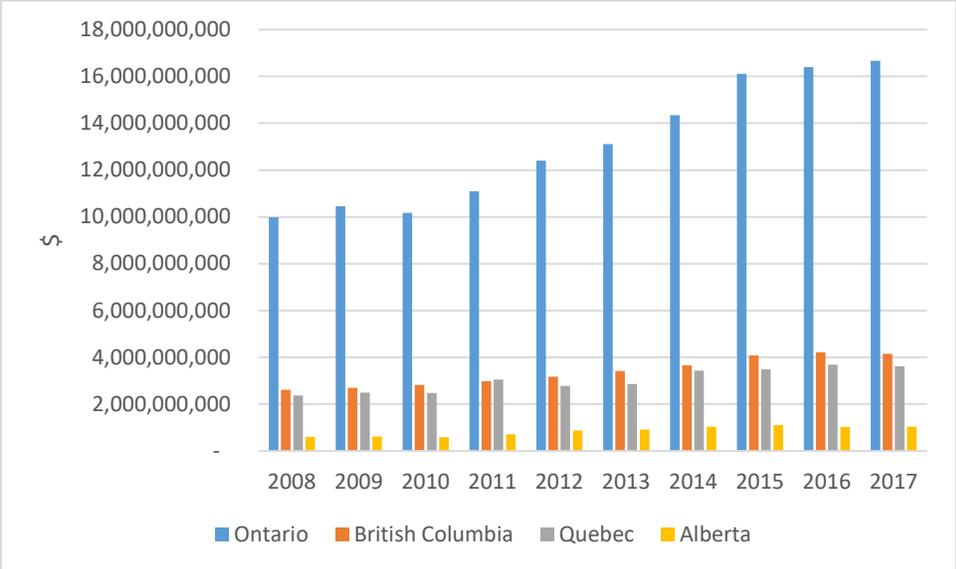
Source: Innovation, Science and Economic Development Canada, 2018

Figure 4.5 illustrates that Ontario has the highest food and beverage manufacturing exports. Ontario food and beverage manufacturing exports represent approximately 30% of national food and beverage manufacturing exports.

4.1.3 Comparison of Ontario Food and Beverage Manufacturing Imports with other Provinces

Figure 4.6 illustrates that Ontario has the highest food and beverage manufacturing imports. Ontario food and beverage manufacturing imports represent approximately 60% of national food and beverage manufacturing imports.

Figure 4.6 Food and Beverage Manufacturing Imports for Select Provinces

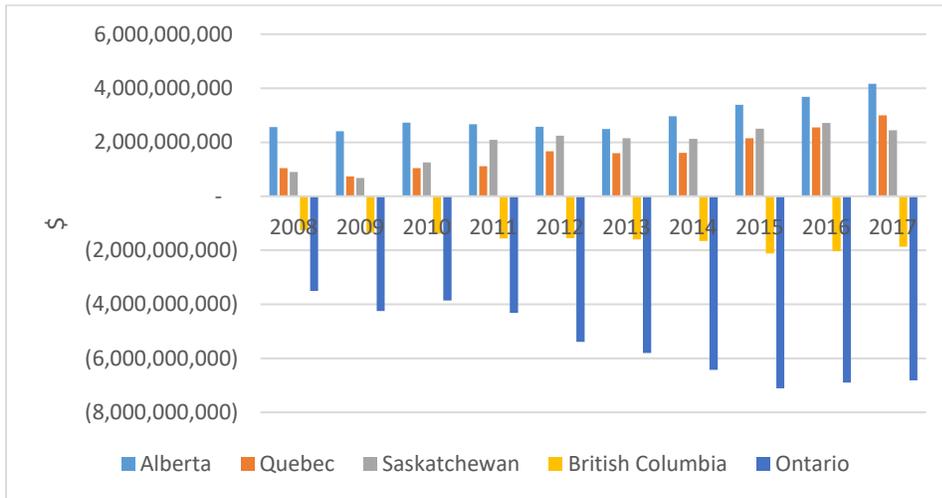


Source: Innovation, Science and Economic Development Canada, 2018

4.1.4 Comparison of Ontario Food and Beverage Manufacturing Trade Balance with other Provinces

Figure 4.7 illustrates that Alberta, Saskatchewan and Quebec have positive trade balance while Ontario and British Columbia have negative food and beverage manufacturing trade balance. Ontario has the highest food and beverage manufacturing imports and exports (see Figure 4.5 and 4.6) however, imports are growing at a faster rate than exports. Over the last ten years imports increased by 84% from \$10.1 billion in 2007 to \$18.6 billion whereas exports increased by 54% from \$6.6 billion in 2007 to \$10.2 billion in 2016.

Figure 4.7 Food and Beverage Manufacturing Trade Balance for Select Provinces

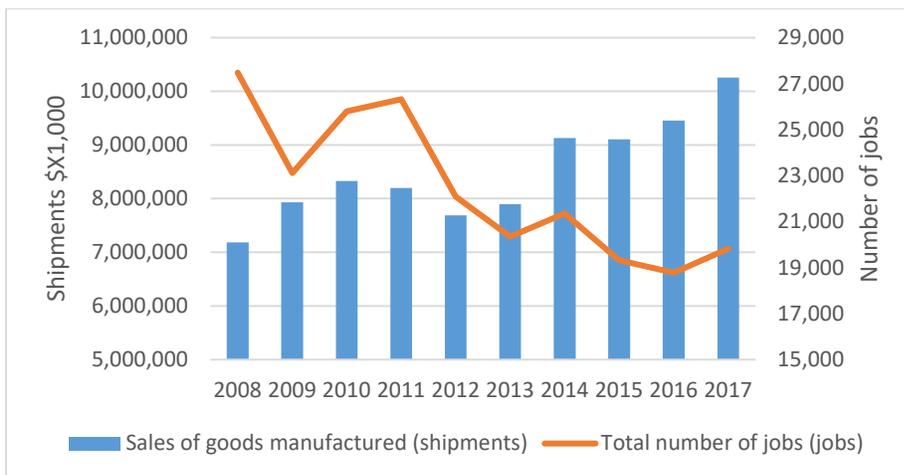


Source: Innovation, Science and Economic Development Canada, 2018

4.2 Meat Product Manufacturing (Ontario)

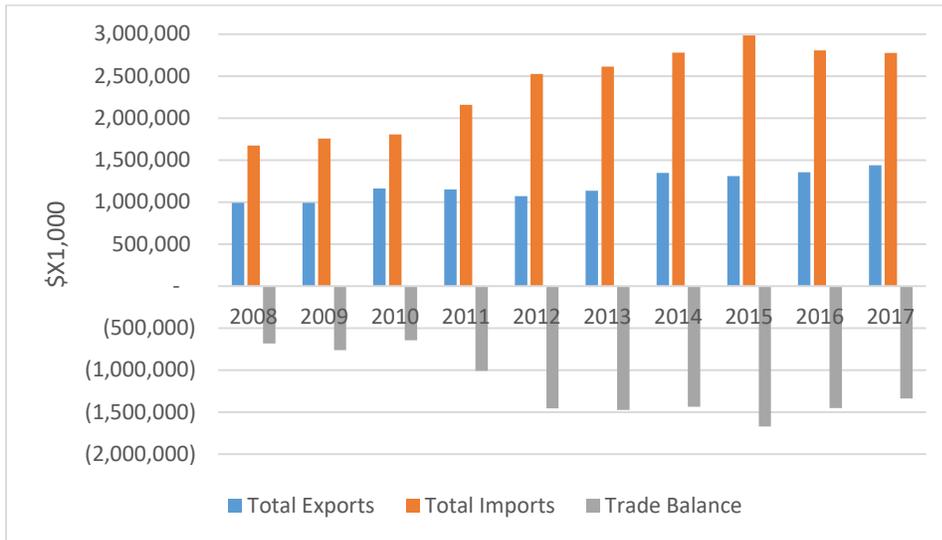
Meat product manufacturing is the third largest employer in Ontario and generates the highest shipments of all food and beverage manufacturing industries. In 2017, meat product manufacturing generated shipments valued at \$10.3 billion, accounting for 24% of total food and beverage manufacturing shipments. Meat product manufacturing employed 19,825 people in 2017, accounting for 21% of total food and beverage manufacturing employment (Statistics Canada, 2017). Ontario accounts for 35% of total Canadian shipments of manufactured meat products.

Figure 4.8 Ontario Sales of Manufactured Meat Products (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0048-01 (formerly CANSIM 383-0031 & 304-0015)

Figure 4.9 Ontario Meat Product Manufacturing Imports, Exports and Trade Balance (\$)



Source: Innovation, Science and Economic Development Canada Online data, 2018

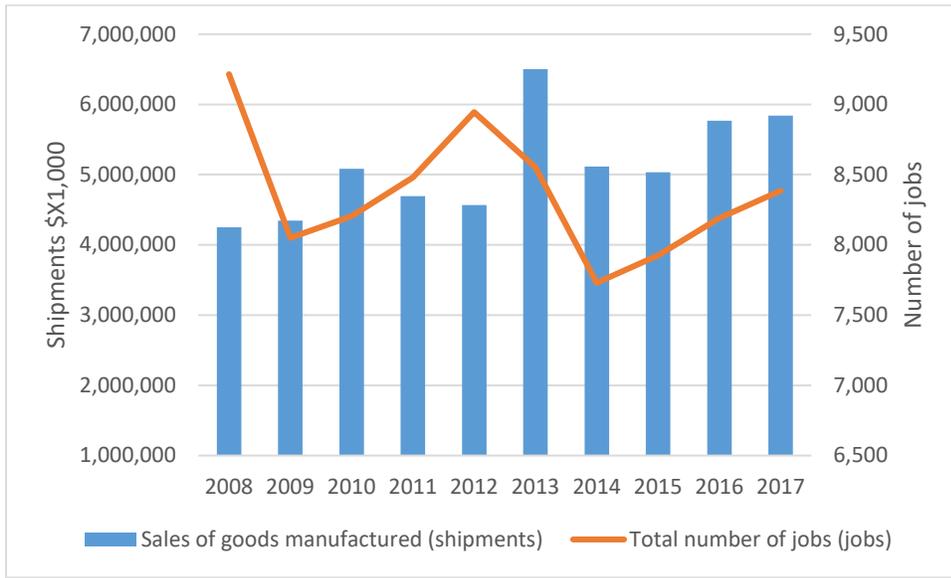
Ontario was a net importer of meat products in 2017, it exported \$1.4 billion and imported \$2.8 billion meat products (refer to Figure 4.9). The United States, China and Japan China are the important countries for meat product manufacturing exports, accounting for 67%, 8% and 8% respectively of total meat product exports. The United States accounts for 81% of meat product imports, while Australia and New Zealand account for 5% and 5% respectively.

4.3 Dairy Product Manufacturing (Ontario)

In 2017, dairy product manufacturing employed 8,385 people, accounting for 9% of total Ontario food and beverage manufacturing employment. Dairy product manufacturing generated shipments valued at \$5.8 billion in 2017, accounting for 13% of total Ontario food and beverage manufacturing shipments (Statistics Canada, 2017). Ontario accounts for 47% of total national dairy product shipments.

Ontario was a net importer of dairy products (refer to Figure 4.11), in 2017 it exported \$242.5 million and imported \$547.8 million dairy products. Ontario exports 72% of dairy product manufacturing exports to the United States, 3% to Saudi Arabia and 3% to the Philippines. The United States, New Zealand and Italy are the most important countries for dairy product manufacturing imports accounting for 74%, 7% and 7% respectively of dairy product imports.

Figure 4.10 Ontario Sales of Manufactured Dairy Products (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0048-01 (formerly CANSIM 383-0031 & 304-0015)

Figure 4.11 Ontario Dairy Product Manufacturing Imports, Exports and Trade Balance (\$)

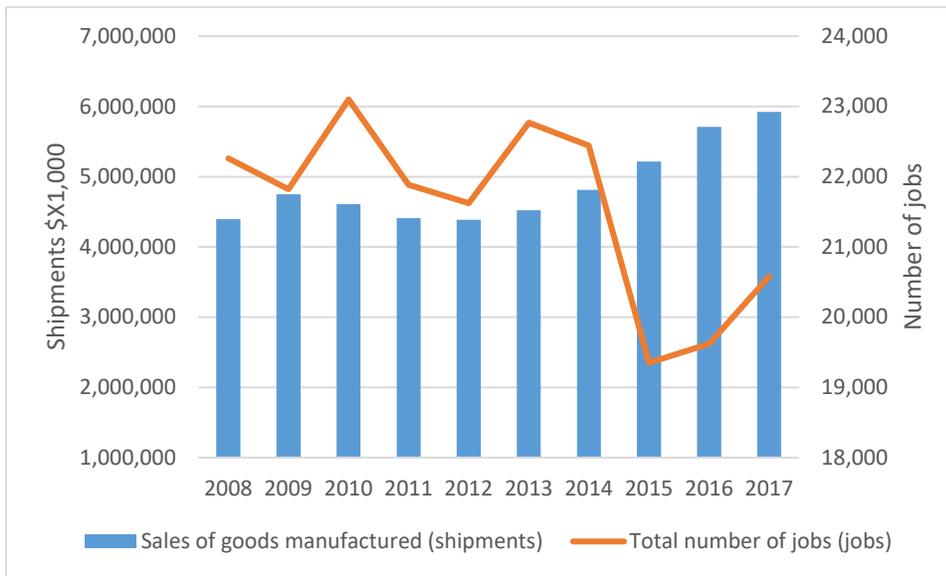


Source: Innovation, Science and Economic Development Canada Online data, 2018

4.4 Bakeries and Tortilla Manufacturing (Ontario)

Bakery and tortilla manufacturing is the largest food and beverage manufacturing employer in Ontario and second largest in terms of shipments. In 2017, bakeries and tortilla manufacturing employed 20,580 people, accounting for 21% of total Ontario food and beverage manufacturing employment. In 2016, bakeries and tortilla manufacturing generated shipments valued at \$5.9 billion, which accounted for 14% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

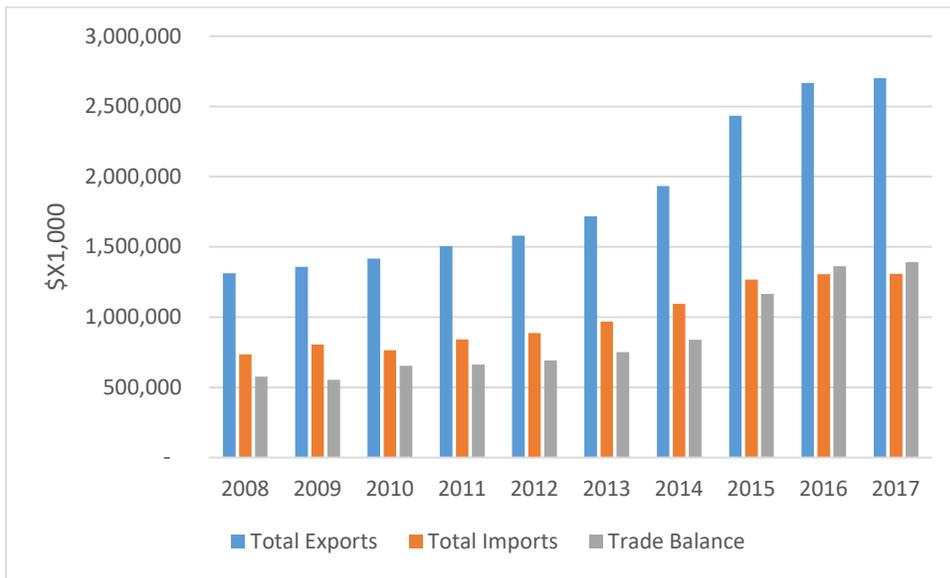
Figure 4.12 Ontario Sales of Manufactured Bakeries and Tortilla (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0048-01 (formerly CANSIM 383-0031 & 304-0015)

Bakeries and tortilla manufacturing is a net exporter, exports have more than doubled in the last ten years increasing from \$1.3 billion in 2008 to \$2.7 billion in 2017. Bakeries and tortilla manufacturing is the only food and beverage manufacturing sub-sector in Ontario that has a positive trade balance. In the last ten years trade balance has more than doubled from \$576 million in 2008 to \$1.4 billion in 2017. The most important countries for exports are the United States 97%, United Kingdom 2% and Australia 0.5%. The most important countries for bakeries and tortilla manufacturing imports are the United States 76%, Mexico 4% and Italy 4%.

Figure 4.13 Ontario Bakeries and Tortilla Imports, Exports and Trade Balance (\$)



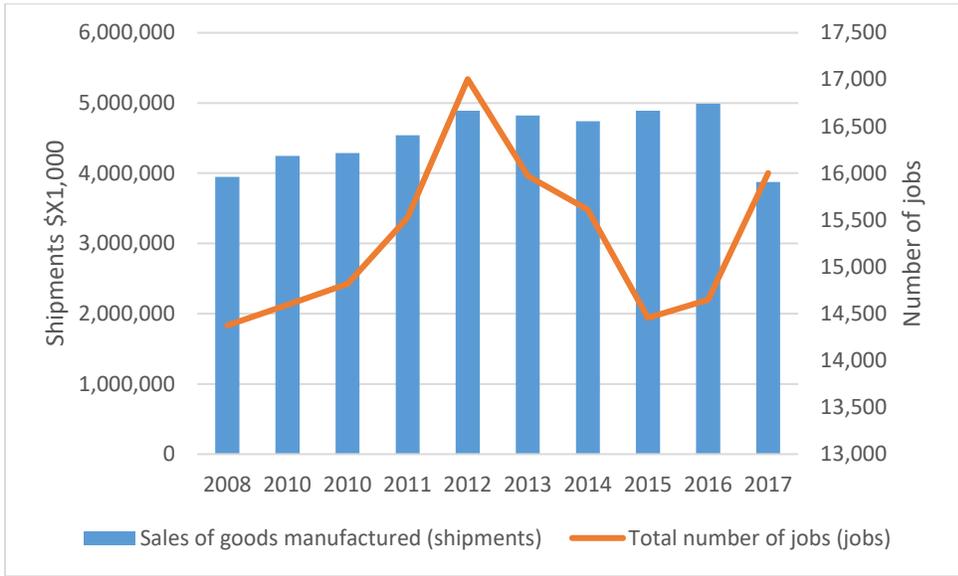
Source: Innovation, Science and Economic Development Canada Online data, 2018

4.5 Beverage Manufacturing (Ontario)

In 2017, beverage and tobacco manufacturing employed 16,000 people, (it is the third largest food and beverage manufacturing employer) accounting for 17% of total food and beverage manufacturing employment. Beverage manufacturing generated shipments valued at \$3.9 billion in 2017, which accounted for 9% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

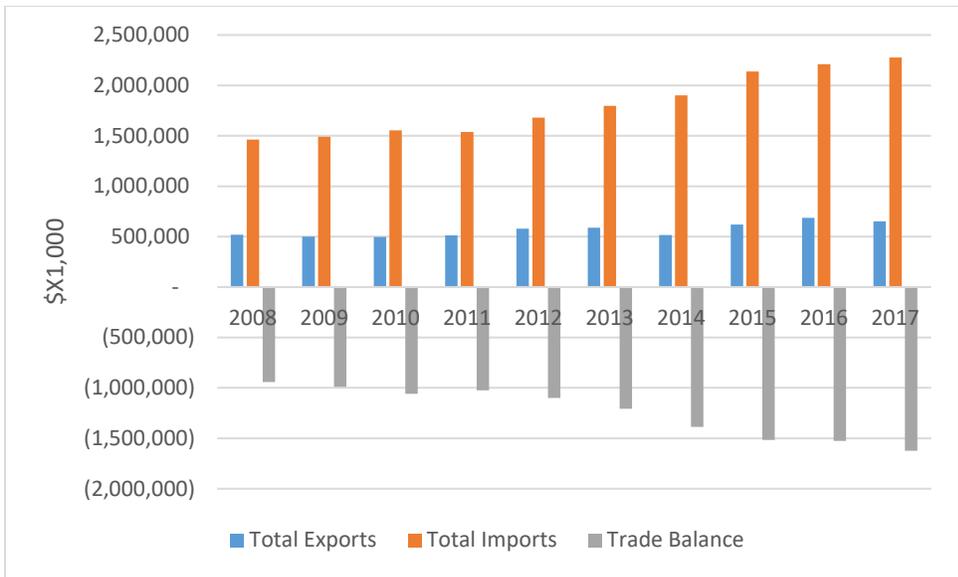
Ontario is a net importer of beverage manufacturing products. The United States 86%, Vietnam 6% and China 2% are the most important countries for beverage exports. Approximately 60% of beverages are imported from the United States (46%), Italy (9%) and France (8%).

Figure 4.14 Ontario Sales of Manufactured Beverage and Tobacco Products (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0048-01 (formerly CANSIM 383-0031 & 304-0015)

Figure 4.15 Ontario Beverage Manufacturing Imports, Exports and Trade Balance (\$)

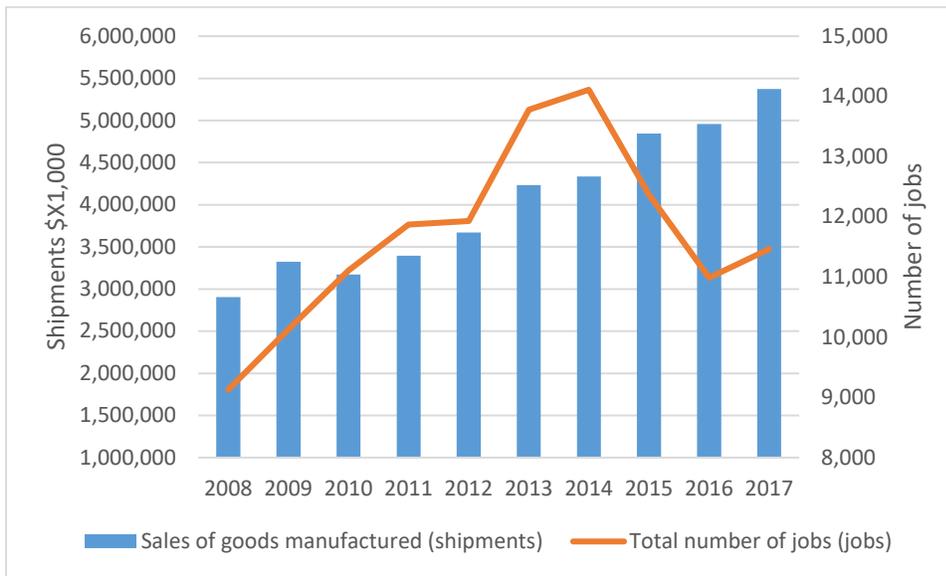


Source: Innovation, Science and Economic Development Canada Online data, 2018

4.6 Other Food Manufacturing (Ontario)

Other food manufacturing includes snack food manufacturing, roasted nut and peanut butter, coffee and tea manufacturing, flavouring syrup and concentrates manufacturing and seasoning and dressing manufacturing among other products. In 2017, other food manufacturing employed 11,465 people, accounting for 12% of total food and beverage manufacturing employment. Other food manufacturing generated shipments valued at \$5.4 billion in 2017, which accounted for 12% of total Ontario food and beverage manufacturing shipments (Statistics Canada, 2017).

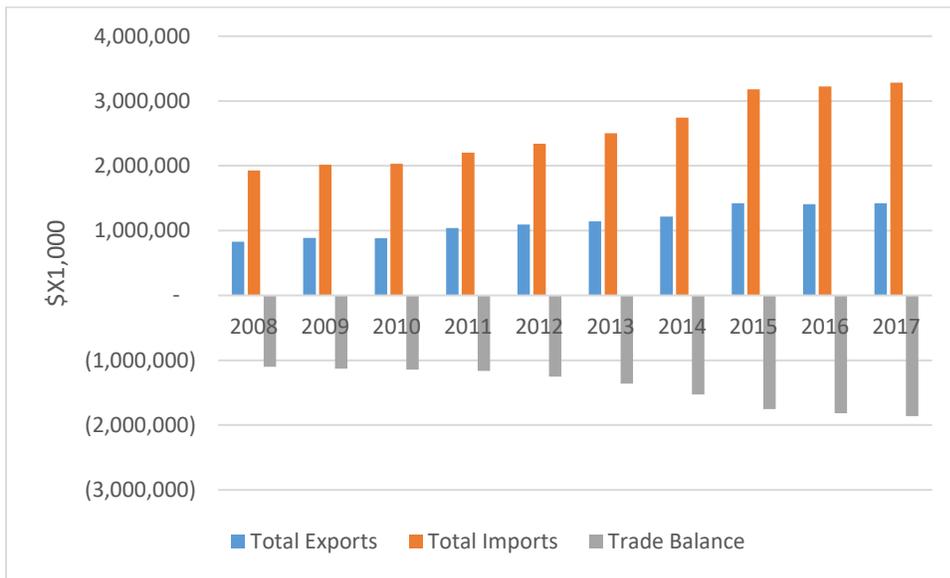
Figure 4.16 Ontario Sales of Manufactured Other Food (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0048-01 (formerly CANSIM 383-0031 & 304-0015)

Other food manufacturing is a net importer. The United States accounts for 79% of imports while Germany and China account for 2% and 2% respectively, of imports for other food manufacturing. The most important countries for other food manufacturing exports are the United States 91%, Saudi Arabia 1% and Philippines 1%.

Figure 4.17 Ontario Other Food Manufacturing Imports, Exports and Trade Balance (\$)



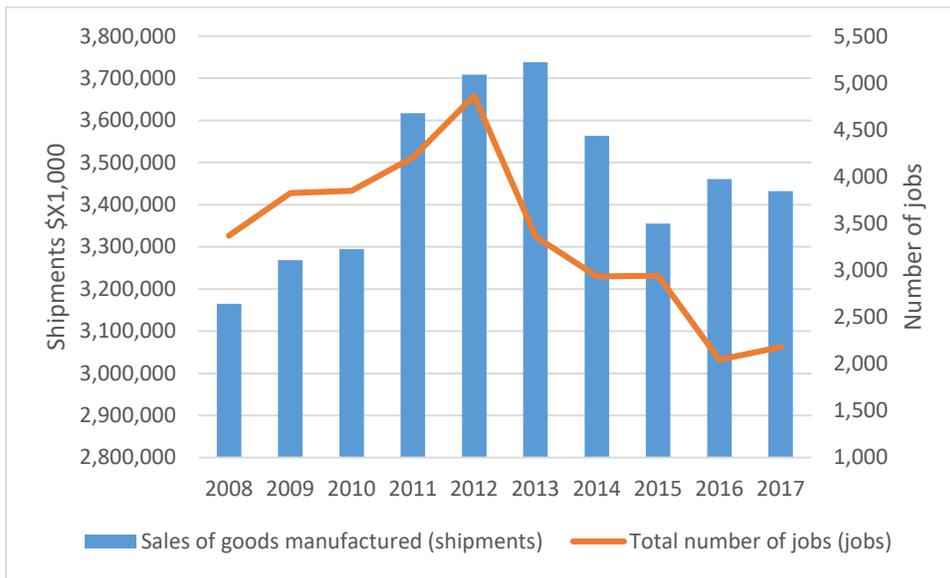
Source: Innovation, Science and Economic Development Canada Online data, 2018

4.7 Grain and Oilseed Milling (Ontario)

In 2017, grain and oilseed milling employed 2,180 people, accounting for 2% of total food and beverage manufacturing employment. Grain and oilseed milling generated shipments valued at \$3.4 billion in 2017, which accounted for 8% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

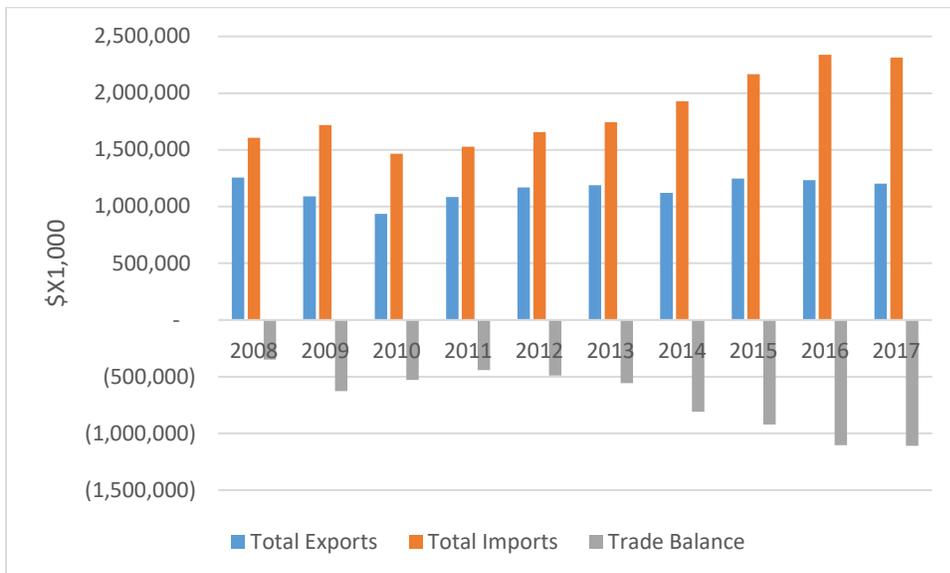
Grain and oilseed manufacturing is a net importer. The United States 95%, Ireland 1% and Mexico 1% are the most important countries for grain and oilseed manufacturing exports. The three most important countries for grain and oilseed manufacturing imports are the United States 73%, Italy 4% and Malaysia 4%.

Figure 4.18 Ontario Sales of Manufactured Grain and Oilseed Products (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0048-01 (formerly CANSIM 383-0031 & 304-0015)

Figure 4.19 Ontario Grain and Oilseed Milling Imports, Exports and Trade Balance (\$)

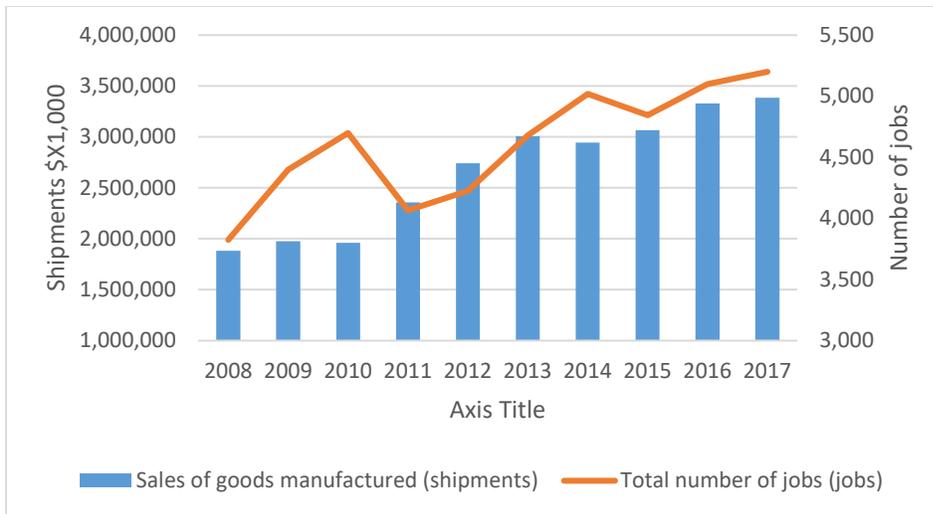


Source: Innovation, Science and Economic Development Canada Online data, 2018

4.8 Animal Food Manufacturing (Ontario)

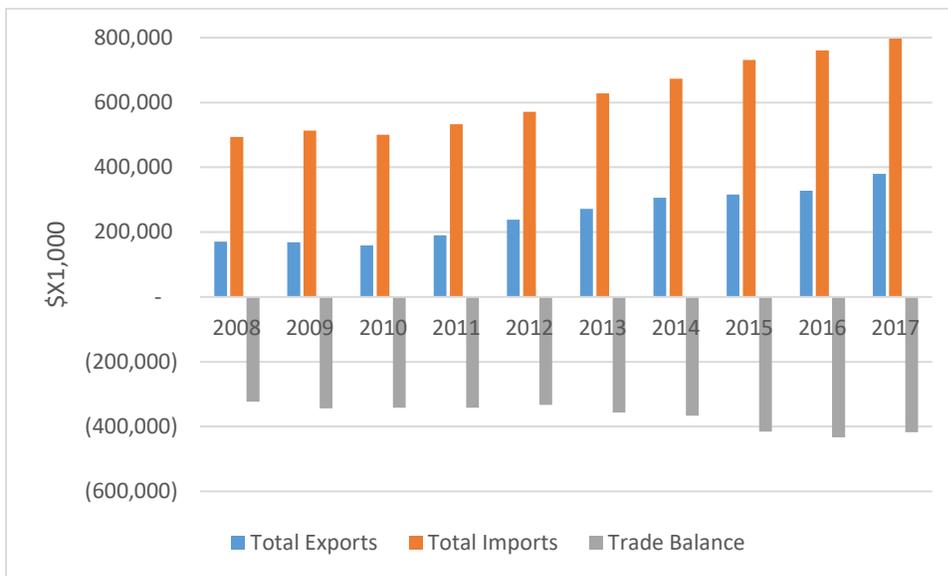
Animal food manufacturing includes dog and cat food manufacturing. In 2017, animal food manufacturing employed 5,200 people, accounting for 5% of total food and beverage manufacturing employment. Animal food manufacturing generated shipments valued at \$3.4 billion in 2017, which accounted for 8% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

Figure 4.20 Ontario Sales of Manufactured Animal Food (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0048-01 (formerly CANSIM 383-0031 & 304-0015)

Figure 4.21 Ontario Animal Food Manufacturing Imports, Exports and Trade Balance (\$)



Source: Innovation, Science and Economic Development Canada Online data, 2018

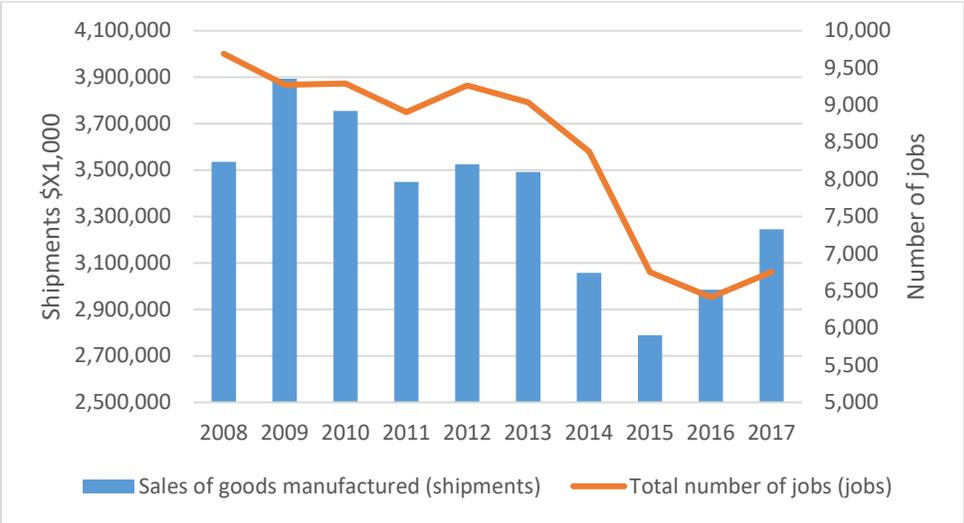
Animal food manufacturing is a net importer. The most important countries for animal food manufacturing exports are the United States 60%, Japan 5% and Mexico 5%. The most important countries for animal food manufacturing imports are the United States 93%, Thailand 2% and China 1%.

4.9 Fruit and Vegetable Preserving and Specialty Food Manufacturing (Ontario)

In 2017, fruit and vegetable preserving and specialty food manufacturing employed 6,755 people, accounting for 7% of total food and beverage manufacturing employment. In 2017, fruit and vegetable preserving and specialty food manufacturing generated shipments valued at \$3.2 billion, which accounted for 7% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

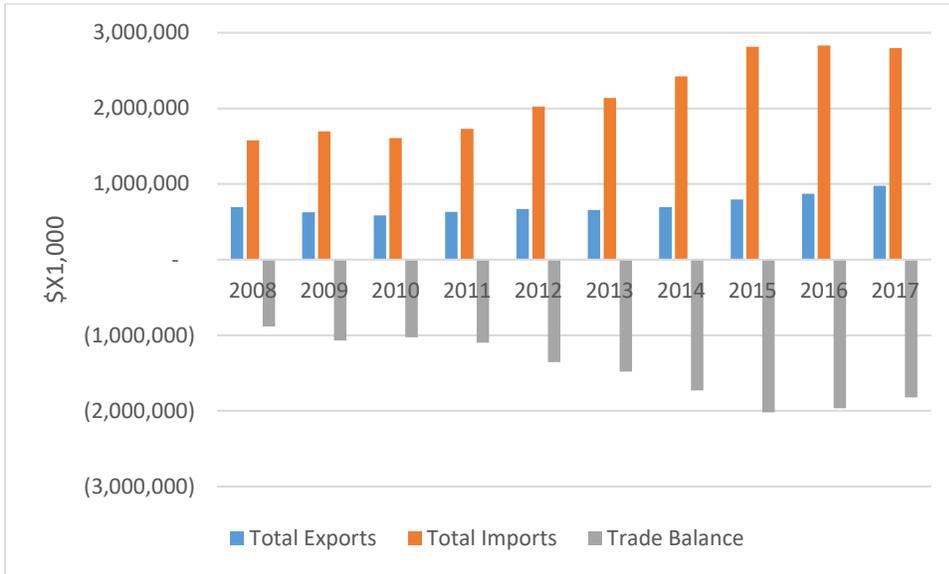
Fruit and vegetable preserving and specialty food manufacturing is a net importer. The United States, Australia and the United Kingdom are the most important countries for exports accounting for 96%, 1% and 1% respectively. The most important countries for fruit and vegetable preserving and specialty food manufacturing imports are the United States 70%, China 6% and Brazil 4%.

Figure 4.22 Ontario Sales of Manufactured Fruit and Vegetable Preserving and Specialty Food (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0048-01 (formerly CANSIM 383-0031 & 304-0015)

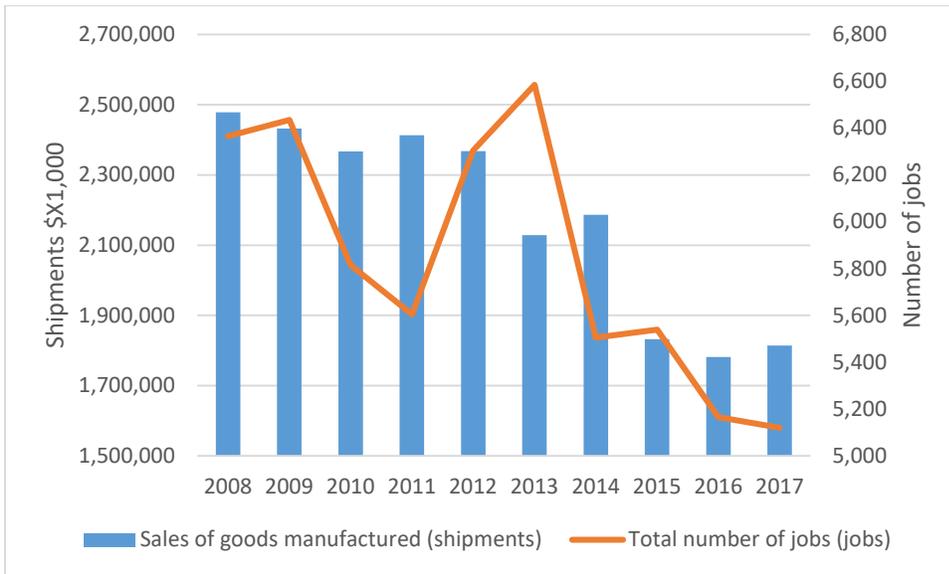
Figure 4.23 Ontario Fruit and Vegetable Preserving and Specialty Food Manufacturing Imports, Exports and Trade Balance (\$)



Source: Innovation, Science and Economic Development Canada Online data, 2018

4.10 Sugar and Confectionery Manufacturing (Ontario)

Figure 4.24 Ontario Sales of Manufactured Sugar and Confectionery (Shipments and Jobs)

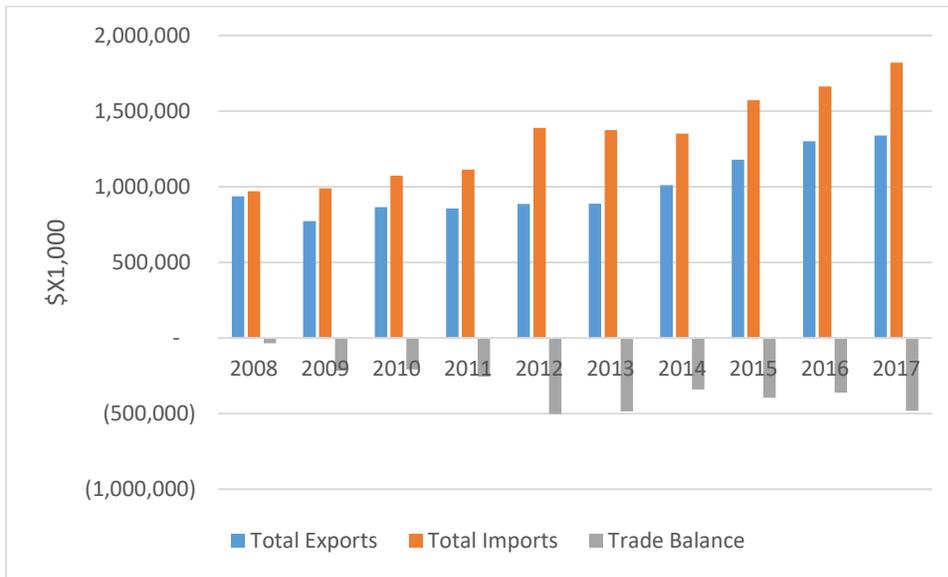


Source: Statistics Canada Table 36-10-0489-01 & 16-10-0048-01 (formerly CANSIM 383-0031 & 304-0015)

In 2016, sugar and confectionery manufacturing employed 5,660 people, accounting for 6% of total food and beverage manufacturing employment. In 2016, sugar and confectionery manufacturing generated shipments valued at \$1.7 billion, which accounted for 4% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

Ontario is a net importer of sugar and confectionery products. The most important countries for sugar and confectionery products exports are the United States 95%, Mexico 1% and Australia 1%. The most important countries for sugar and confectionery products imports are the United States 64%, Mexico 7% and Brazil 3%.

Figure 4.25 Ontario Sugar and Confectionery Product Manufacturing Imports, Exports and Trade Balance (\$)



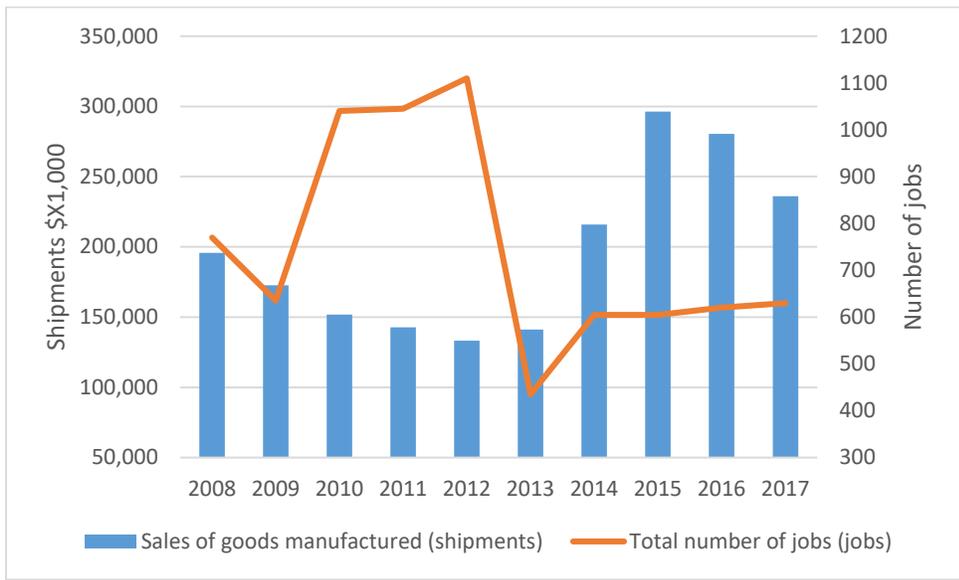
Source: Innovation, Science and Economic Development Canada Online data, 2017

4.11 Seafood Product Preparation and Packaging (Ontario)

In 2016, seafood product preparation and packaging employed 565 people, accounting for 1% of total food and beverage manufacturing employment. In 2016, seafood product preparation and packaging generated shipments valued at \$319 million, which accounted for 1% of total food and beverage manufacturing shipments (Statistics Canada, 2017).

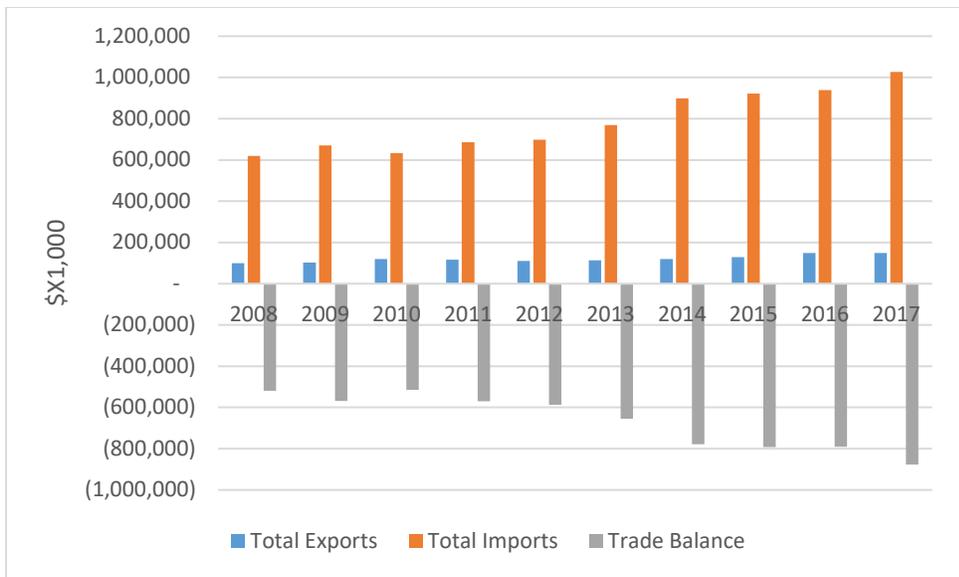
Seafood product preparation and packaging is a net importer. The United States 88%, China 3% and Japan 2% are the most important countries for seafood products manufacturing exports. The most important countries for seafood products manufacturing imports are Thailand 19%, China 18% and the United States 10%.

Figure 4.26 Ontario Seafood Product Preparation and Packaging (Shipments and Jobs)



Source: Statistics Canada Table 36-10-0489-01 & 16-10-0048-01 (formerly CANSIM 383-0031 & 304-0015)

Figure 4.27 Ontario Seafood Product Manufacturing Imports, Exports and Trade Balance (\$)



Source: Innovation, Science and Economic Development Canada Online data, 2018

Chapter 5: Data Sources and Information Gaps

Collecting and compiling information about food and beverage manufacturing companies can be challenging due to the complexity of the food system. The food system operates within the economy of its nation and a market that extends around the world. The institutional and macroeconomic environment in which the firms operate influences firm investment, competitiveness, innovation and productivity. To understand the food and beverage manufacturing industry we analyzed (publicly available) secondary data (obtained from Statistics Canada CANSIM tables and Innovation, Science and Economic Development Canada trade data and conducted an extensive review of the literature (market trends data from Euromonitor, industry and government publication). This chapter provides a summary of current sources of data and highlights some information gaps and makes recommendations on how to bridge data and information gaps.

5.1 Current Sources of Data

5.1.1 Statistics Canada data

Statistics Canada collects microdata and disseminates aggregate data about organizational and economic characteristics of Canadian based industry groups. The Statistics Act prohibits Statistics Canada from releasing any information it collects that could identify any person, business or organization. For this reason, Statistics Canada reports aggregate data in CANSIM tables. Statistics Canada CANSIM tables provide information on employment, shipments, value added, global value chains, business strategy and innovation. Data from Statistics Canada were useful in that in most cases the data were grouped using NAICS classification, however, in some cases (e.g. trade and supply and disposition tables) the data were only available for individual commodities (i.e. not grouped into NAICS classification).

5.1.2 Innovation, Science and Economic Development Canada Trade Data

Innovation, Science and Economic Development (ISED) Canada reports the monetary value of trade data (exports, imports and trade balance) using NAICS classification. ISED uses weights to compile trade data. Statistics Canada, on the other hand, reports (trade data) both quantity and monetary value of traded commodities, however, Statistics Canada does not group commodities into NAICS classifications (i.e. it only reports on specific commodities).

5.1.3 Ivey Business School Agri-Food Data (on Mergers and Acquisitions)

Researchers at the Ivey Business School at Western University compiled a lot of useful information about business mergers, acquisitions, new businesses and business closures. Ivey data includes dates (of closure or merger or acquisition), province of operation, number of employees, number of plants and reason for closure, merger or acquisition. This is a good starting point. Nevertheless, one should have some understanding of the total population for statistical validity and statistical representation.

5.1.4 Euromonitor Industry Trends Data

The Euromonitor Passport database collects information on the company (brief profile of operations) and product annual sales volume and quantity, industry trends (including production and consumption trends). Euromonitor also reports on company market share, brand share and competitiveness.

5.2 Data Challenges and Shortcomings

Challenge of access and utilization includes technical (measurement), political, legal and commercial sensitivity. There are also challenges with data heterogeneity, inconsistency and incompleteness.

- One of the major challenges is ownership that is tied to commercial sensitivity of sharing data. Companies that own data may not be willing to share their data because competitors can use it against them. This is unfortunate for researchers because they lose the opportunity of gaining insights from examining the data and to measure the impact of government policies on the market.
- Legal constraints on privacy – data can capture large amounts of personal or commercially sensitive information. To safeguard companies and to prevent misuse, Statistics Canada provides information in anonymized or aggregate forms.
- The broad scope of data collection by Statistics Canada limits specification and focusing on certain issues.
- The usefulness of statistics is limited by the structure of current industrial classification system, the reporting requirements that generate the underlying data, and the data processing methods agencies employ.
- Without a specific mandate to report on food and agriculture, these agencies have had little reason to overcome these issues and undertake systemic reporting.
- There is lack of data necessary to examine industry-wide impacts of policy interventions and economic shocks on food and beverage manufacturing.
- Sometimes data is heterogeneous, for example, trade data. Innovation, Science and Economic Development (ISED) Canada reports the monetary value of trade data

(exports, imports and trade balance) using NAICS classification. The shortcomings of the data are it does not report quantity and currency on the invoice. A combination of value, quantity, exchange rate and currency is more useful for mapping trends.

- Statistics Canada on the other hand reports (trade data) both quantity and monetary value of traded commodities, however, Statistics Canada does not group commodities into NAICS classifications (that is, it only reports on specific commodities).
- Statistics Canada's mandate is to respect confidentiality and ensure that data is statistically sound. Consequently, issues such as low response rates in surveys or few players in certain markets result in data suppression or data that cannot be used as time series data.
- Statistics Canada is constantly changing methods of data collection and analysis to achieve statistical soundness. As a result, the data cannot be used as time series data due to periodic changes in data analysis and or collection methods.
- Supply and demand quantity is only reported for specific commodities, this data is not available in NAICS classification.
- Constraints of survey data include attaining acceptable response rates, achieving adequate sample size and obtaining reliable answers from respondents

5.3 Recommendations for Filling Data and Information Gaps

As mentioned earlier, publicly available data is aggregated which limits the ability to predict or explain some trends in consumer and firm behaviour. Restricted use data such as Statistics Canada micro-data can be useful in consolidating food and beverage manufacturing industry data. However, to adequately study economic activity associated with food and beverage manufacturing there is need for an expansion of current data collection and reporting framework. This requires collaboration among several stakeholders (industry, researchers/academia and government agencies) to develop new ways of collecting data to increase the accuracy of prediction and value of data.

Researchers can access establishment and firm level micro-data by following the application procedures developed by Statistics Canada. The Canadian Centre for Data Development and Economic Research (CDER) manages microdata that is collected using surveys and/or other instruments. An in-depth analysis of some specific issues may require the use of other instruments such as case studies and surveys. Table 5.1 illustrates Statistics Canada micro level databases that can be accessed to understand some information gaps. Table 5.2 outlines some data gaps that require new ways of improving the value of data.

Table 5.1 Statistics Canada Micro Data Sets

Name of survey/Database	Instrument	Information collected	Data gap to be addressed	Coverage period
Canada Border Services Agency Customs Database	Database	Information on quantity, value in Canadian dollars, country of export, U.S. state of origin, country of origin and value of duty code and currency of invoice data from the Canada Border Services Agency	Trade quantity and value. The only issue is that the data might not be classified into the NAICS classification system	July 2002 to June 2008
Annual survey of manufactures – Import registry databases	Database	Tracks the value of commodities imported by establishment and commodity type	Trade quantity and value. The only issue is that the data might not be classified into the NAICS classification system	2002 to 2008
Capital and Investment Program (CIP)	T2 corporate income tax returns	Information on the stock of and investment in tangible and intangible capital assets for each employer business in Canada	Will be useful in understanding firm growth dynamics	2000 to 2012
Longitudinal Employment Analysis Program (LEAP)	Employment and payroll information for each employer business in Canada	It is the primary source for studies on employment creation and destruction in Canada. The longitudinal nature of LEAP allows firm entry and exit times to be measured with precision.	Which food and beverage industries are creating and destroying jobs	1991 to 2012

Table 5.2 Case Studies and Other Data Collection Instruments

Data gap	Current source of information	Gap description	Recommendation
Shortage of skilled labour	Anecdotal information	There is no data to quantify the skills required	Case study
Energy use	Statistics Canada CANSIM table 128-0005 and 128-0006	Reports aggregate food (311) and beverage (312) energy consumption not specified by industry and only reports quantity and not cost	Not sure
Innovation and research and development	Survey of Innovation and Business Strategies (SIBS)	Data does not offer specific details on types of innovations adopted by each industry	Case study
Food waste and loss	CANSIM supply and disposition tables	Food waste/loss data is not available in NAICS classification	Case study

5.4 Potential Research Areas

5.4.1 Which Factors of Growth do Firms Value Most?

Typical measures of firm growth are the growth of assets or capital employed, turnover, profits and number of employees. Firm growth is related closely to economic growth and has consequences for employment. Sometimes goals of the government and those of private companies diverge, for example, private companies are mainly concerned about profit margins while the government is concerned with creating new jobs and increasing number of jobs. It is obvious that company closures result in job losses, however, in some instances company mergers and acquisitions result in increased profit margins and job losses. The main motive for mergers and acquisitions is to increase profit margins through synergies and improved operating efficiency. The government has to develop a strategy of reconciling firm growth (increase in number of employees) and profit margins.

5.4.2 Measuring Process Innovation

Process innovation is difficult to measure because product and process innovation are endogenous, innovation is not a linear process (inputs are not automatically transformed into outputs) and there are no established methods for measuring process innovation output. In addition, individual process innovations differ a lot. Response rates are low and researchers find

it difficult to distinguish between process innovation and product innovation. Current methods use binary/categorical data to measure the share of cost reduction and increase in sales due to quality improvement. Quality improvement effects of process innovation are difficult to quantify. Therefore, results are expressed as percentages, which is limiting in that it cannot be used as time series and it does not give background information.

Innovation is a continuous process therefore difficult to measure and is characterized by small incremental changes. Information on innovation expenditure is normally not specified in firm's financial accounts, making it difficult for firms to calculate it. It is challenging for a survey to capture timing of the innovation activities, their implementation, and their impact. Innovation surveys cannot provide information on firm's experiences with institutions such as the education system, the labour market and financial systems. Furthermore, full separation of intramural and extramural expenditure is difficult.

5.4.3. How to Measure the Impact of Government Programs

The government has developed a number of programs, including education and worker training programs, corporate tax credits and health and safety regulations. However, there is no information to evaluate their impact. The data would be useful for evaluating future policy initiatives. For example, there are claims that the CFIA and Health Canada food labelling modernization initiative adds cost to manufacturers (do the benefits justify the costs?). Anecdotal evidence suggests that the accelerated capital cost allowance program has significantly assisted in the purchase of productivity-enhancing machinery. Yet there is no data to quantify the outcome of policy initiatives.

5.4.4 Impact of Company Health and Food Safety Initiatives

Manufacturers sometimes develop food safety and quality standards initiatives that are not mandated by the government. In such instances what is the government doing or what can be done to motivate manufacturers? For instance, companies took the lead on ground beef irradiation but in retail, Loblaw packs U.S. non-radiated beef in similar containers as Canada radiated ground beef (it is not labelled, neither is it differentiated by price). How useful are initiatives such as reduced salt, sugar and fat in processed food, which commodities have benefited and should more research be conducted?

5.4.5 Foreign Direct Investment

Ownership of firms is an important topic to understand and one has to answer ask question such as: Are Canadian businesses expanding ownership in foreign countries? Which industries are investing more, is it grain and oilseed or bakery? Does Foreign Direct Investment reflect the

competitive success of the home country or FDI occurs because the home country is not competitive? What factors affect competitiveness? What factors affect investment?

5.4.6 Automation and Robots

The Statistics Canada Survey of Innovation and Business Strategy (SIBS) covers fourteen sectors including food and beverage manufacturing. The broad scope of the survey makes it difficult to collect information that is specific to a particular industry. For this reason, a case study approach might be more informative. The technology used in one food manufacturing industry is not necessarily the same technology used in another industry. For example, meat processing and oil and grain milling may require different technologies. A case study or an in-depth analysis of the sector can help one to understand the varying levels of technology adoption across firms.

5.4.7 Food and Beverage Manufacturing Jobs

Statistics Canada reports the number of jobs per industry on a monthly and annual basis. This information is important for a general overview of the sector. However, more details on the number of jobs by the size of establishment would be useful in identifying trends in job creation and losses.

5.4.8 Demand for Skilled Persons and Training

Processes such as filling bottles, washing vegetables and fruits, labelling and sealing have become automated. Skills set demanded for these operations have moved from manual labour to that of skilled machine operators. Some literature suggests that there is lack of food processing and manufacturing industry-specific courses. The question is what are the skills that production workers need to help manufacturers thrive and what are the sources of job growth and destruction and how have salaries evolved.

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5.5.1 Appendix 1: Definition of Terms (Source: Statistics Canada)

- Food manufacturing comprises of establishments primarily engaged in producing food for human or animal consumption
- Manufacturing shipments – measures the monetary value, not quantity of goods produced
- Manufacturing value added – a measure of net output, consists of manufacturing shipments plus net change in inventory of goods in processed and finished goods, less cost of purchased inputs (i.e. the cost of materials and supplies and cost of fuel and electricity)
- Capital investment – gross expenditure on fixed assets, capital interest on loans
- Company – the organizational unit for which income and expenditure accounts are maintained from which operating profit and rate of return on capital can be derived
- Establishment – is the level at which accounting data required to measure production is available (i.e. total sales or shipments, cost of materials and services, cost of labor and capital)
- Location – a single geographic location at which economic activity is conducted and for which, at a minimum, employment data are available.
- NAICS - North American Industry Classification System
- Labor productivity index – real Gross Domestic product in chained dollars per hour worked in the business sector.
- Manufacturing shipments report the production of goods produced by Canadian establishments, it measures the monetary value, not the quantity of manufactured goods
- Gross Domestic Product is the total unduplicated value of the goods and services produced during a specific period. The level of GDP reveals the size of the economy, while GDP change from one period to another period indicates whether GDP is expanding or contracting. GDP can be measured in three ways referred to as the production approach, income approach and expenditure approach
- Production approach or value-added approach consists of summing the gross value added of all industries. The difference between an industry's output and its intermediate consumption is its gross value added
- Income approach – consists of summing all the sector or primary incomes earned in the production process plus taxes less subsidies on products
- Expenditure approach – consists of summing the expenditures on those ultimate or final purchases of the goods and services produced in each period.
- The size of a business is defined by the value of its annual sales, its annual gross or net revenue, the value of its assets or the number of people it employs
- Cost of materials and supplies only reports commodity items or physical goods (e.g. cost of purchased raw materials, shipping containers and materials). It does not include cost of services or overhead charges like advertising, insurance and GST etc.
- Total Imports include all goods which have entered Canada by crossing territorial borders whether for immediate domestic consumption or for storage in custom bonded warehouses. It also includes goods that have re-entered Canada after having been exported abroad without being materially altered or substantially enhanced in value while abroad.

- Total Exports include all goods leaving the country through customs for a foreign destination. It consists of the sum of exports and re-exports
- Bioactive is a substance that is demonstrated or purported to have a favorable effect on health. Includes nutrients like vitamins and minerals and non-nutrients like live microbes
- Functional foods are similar in appearance to, or may be a conventional food, consumed as part of a usual diet, which is demonstrated to have a physiological benefit and or reduce the risk of chronic disease beyond basic nutrition functions. They are foods that have been actively enhanced with bioactives during production e.g. probiotics, omega 3 and sterols.
- Natural Health Products are naturally occurring substances that are used to restore or maintain good health. They include vitamins, minerals, amino acids, essential fatty acids, herbal remedies, homeopathic medicines, traditional medicines and probiotics.
- Other food manufacturing includes snack food, coffee, tea, flavoured syrup and concentrates, seasoning and dressings and all other food manufacturing.
- Variety cheese includes cheddar, mozzarella, cream, cottage, Swiss, parmesan, ricotta, Monterey Jack, feta and gouda among others

5.5.2 Appendix 2: Statistics Canada Micro Data

The Canadian Centre for Data Development and Economic Research (CDER) manages micro data that is collected using surveys and/or other instruments. Table 5.3 provides a list of surveys used for collecting food and beverage manufacturing micro data.

Table 5.3 Statistics Canada surveys and databases for collecting Micro data

Survey name	Nature	Usage	Content	Coverage period
Annual Survey of Manufactures (ASM)	Survey covers all manufacturing locations, together with associated head offices, sales offices and auxiliary units	The survey can be linked to various longitudinal databases based on industry classifications used in various periods	Principal Industrial statistics such as shipments, employment, salaries and wages, cost of materials and supplies used, etc.	1961 to 2012
Annual Survey of Manufactures – Import Registry Databases	Tracks the value of commodities imported by establishment and commodity type	Can be used to analyze the importing behavior in manufacturing	The ASM-Import registry database includes all records in the ASM and in the importer registry	2002 to 2008
Canada Border Service Agency Customs Database	Longitudinal administration database on import transactions	Can be used to study issues related to exchange rate pass-through	Information on quantity, value in Canadian dollars, country of export, country of origin from the Canada Border Services Agency	July 2002 to June 2008
Canadian Employer-Employee Dynamics Database	Longitudinal administrative database of employers and employees	Can be used to study business effect on labor productivity, and the impacts of organizational changes (mergers and acquisitions)	CEEDD is a matched employer-employee database, which includes both firm level and individual-level characteristics	2001 to 2010
Capital and Investment Program (CIP)	Longitudinal administrative database of companies	Can be used to support research on firm level economic and productivity analysis	Information on the stock of and investment in tangible and intangible capital assets	2000 to 2012
Longitudinal Employment Analysis	Longitudinal administrative database of enterprises	The longitudinal nature of LEAP allows entry and exit times to be	Employment and payroll information for each employer business in Canada	1991 to 2012

Program (LEAP)		measured with precision		
Longitudinal Worker File (LWF)	Longitudinal administrative database on employees	It is particularly well-suited to studying labor turnover and mobility, earnings dynamics and a host of other issues	The LWF is designed to provide information on employment dynamics in Canada. It is based on a 10% random sample	1983 onwards
National Accounts Longitudinal Microdata File (NALMF)	Longitudinal administrative database of firms	Can be used to examine the economic activity at sub-provincial levels	The database is designed to track the GDP and employment of firms and the locations in which they operate	2001 to 2012
T2-LEAP	Linkage of data from T2 form to the LEAP dataset	Can be used to study firm dynamics, industry turnover and productivity growth as well as the relationship between firm financing and performance	The T2-LEAP brings together among other things sales, gross profits, equity and assets for all incorporated firms in Canada with the employment and payroll data from LEAP	1984 to 2012
Survey of Financing of Small and Medium Enterprises	Cross-sectional survey of small and medium sized businesses	Can be used to study small and medium sized businesses	The database contains information on the types of debt that small and medium enterprise rely on	2000, 2001, 2004 and 2007
Survey of Innovation and Business Strategies (SIBS)	Sample survey with a cross-sectional design	Can be used to analyze firm's strategy, activities and choice	The database contains statistical information on strategic decisions, innovation activities and operational tactics	2009 and 2012
Workplace Employee Survey (WES)	Combination of a workplace survey and a survey of employees (within the same workplaces)	The database allows researchers to investigate changes that occur among employees and to link these changes to events taking place in firms and vice versa	The primary goal of the WES is to establish a link between events occurring in workplaces and the outcomes for workers	1999 to 2006 1999 to 2005

Source: Statistics Canada <http://www.statcan.gc.ca/eng/cder/data>

5.5.3 Appendix 3: Statistics Canada Food and Beverage Manufacturing Data CANSIM Tables

Survey name	Data/variables	Coverage period	Active CANSIM tables
Capacity Utilization Rates	Energy technology, efficiency, renewable energy	1987 to ongoing	028-0002
Food Availability per Person	Supply and disposition, food available	1960 to ongoing	002-0010 002-0011
Monthly Gross Domestic Product	National	1997 to ongoing	379-0031 379-8031
Annual Gross Domestic Product by Industry – Provincial and Territorial	Chained 2007 dollars	1997 to ongoing	379-0030
Labour Productivity Measures (Annual)	Provinces and territories	1997 to ongoing	383-0031
Monthly Survey of Manufacturing	Sales, inventories, orders	1992 to ongoing	304-8014, 304-8015, 377-8009, 304-0014, 304-0015, 377-0009
Productivity Measures and Related Variables	Multifactor productivity	1997 to ongoing	383-0024, 383-0025, 383-0032
Survey of Employment, Payrolls and Hours	Hours worked and compensation	2001 to ongoing	
Survey of Advanced Technology	Business intelligence, information control	2014	358-0416, 358-0403, 358-0404, 358-0405, 358-0402, 358-0432, 358-0427, 358-0417, 358-0422, 358-0454, 358-0429, 358-0419, 358-0428, 358-0409, 358-0451, 358-0436, 358-0413, 358-0455, 358-0443, 358-0447, 358-0446, 358-0445, 358-0444, 358-0420, 358-0434, 358-0430, 358-0421, 358-0435, 358-0431, 358-0448, 358-0408, 358-0401, 358-0400, 358-0406, 358-0407, 358-0418, 358-0412, 358-0415, 358-0411, 358-0433, 358-0437, 358-0441,

			358-0439, 358-0450, 358-0442, 358-0438, 358-0440
Survey of Innovation and Business Strategy	Product, process, organizational and marketing innovation	2003 and 2005	Cannot be used as time series data
Survey of Innovation and Business Strategy (SIBS)	Product, process, organizational and marketing innovation	2009 to 2012, 2007/2009 to 2010/2012	358-0238, 358-0237, 358-0265, 358-0264, 358-0313, 358-0255, 358-0247, 358-0241, 358-0275, 358-0281, 358-0280, 358-0279, 358-0287, 358-0293, 358-0285, 358-0277, 358-0276, 358-0249, 358-0245, 358-0254, 358-0278, 358-0282, 358-0314, 358-0331, 358-0244, 358-0305, 358-0316, 358-0325, 358-0324, 358-0321, 358-0271, 358-0300, 358-0295, 358-0274, 358-0315, 358-0298, 358-0267, 358-0326, 358-0323, 358-0301, 358-0291, 358-0289, 358-0272, 358-0273, 358-0319, 358-0320, 358-0296, 358-0297, 358-0329, 358-0262, 358-0263, 358-0269, 358-0294, 358-0283, 358-0288, 358-0304, 358-0258, 358-0259, 358-0257, 358-0332, 358-0334, 358-0290, 358-0268, 358-0268, 358-0322, 358-0253, 358-0299, 358-0327, 358-0328, 358-0248, 358-0307, 358-0333, 358-0312, 358-0306, 358-0240, 358-0242, 358-0243, 358-0251, 358-0256, 358-0252,

			358-0330, 358-0303, 358-0292, 358-0284, 358-0335, 358-0318, 358-0308, 358-0309, 358-0310, 358-0311, 358-0302, 358-0270, 358-0317, 358-0226, 358-0261, 358-0246, 358-0239, 358-0250, 358-0260, 358-0266
Annual Industrial Consumption of Energy Survey	Energy consumption gigajoules and cubic meters	1995 to 2015	128-0006 128-0005
Annual Survey of Manufactures and Logging (ASML)	Total revenue, expenses, value added, inventory	2012 to 2015	301-0009 301-0008
Annual Survey of Research and Development in Canadian Industry	Research and development expenditure	2014	358-0518, 358-0510, 358-0520, 358-0521, 358-0519, 358-0514, 358-0523, 358-0526, 358-0522
Canadian International Merchandise Trade (customs basis)	Imports and exports	1997 to ongoing	NAPCS – North American Product Classification System
Monthly Dairy Factory Production and Stocks Survey	Commercial sales, production, stocks, supply and disposition	1960 to ongoing	003-0012, 003-0034, 003-0029, 003-0009, 003-0010, 003-0007
Monthly Inventory Statement of Butter and Cheese	Stocks of specified dairy products	1970 to ongoing	003-0033
Quarterly Stocks of Frozen and Chilled Meats Survey	Food available, stocks, supply and disposition	1960 to ongoing	003-0082, 003-0081

Source: Statistics Canada CANSIM